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SHELL ROCK RIVER + WINNEBAGO RIVER

COMPREHENSIVE WATERSHED MANAGEMENT PLAN

FEBRUARY 2022

CLEAN WATER LAND & LEGACY AMENDMENT

THANK YOU + ACKNOWLEDGMENTS

SHELL ROCK AND WINNEBAGO RIVER WATERSHED
ONE WATERSHED, ONE PLAN PARTNERS (PARTNERSHIP)

Freeborn County
Freeborn Soil and Water Conservation District
Shell Rock River Watershed District
City of Albert Lea

STATE AGENCIES

Minnesota Board of Water and Soil Resources
Minnesota Department of Agriculture
Minnesota Department of Health
Minnesota Department of Natural Resources
Minnesota Pollution Control Agency

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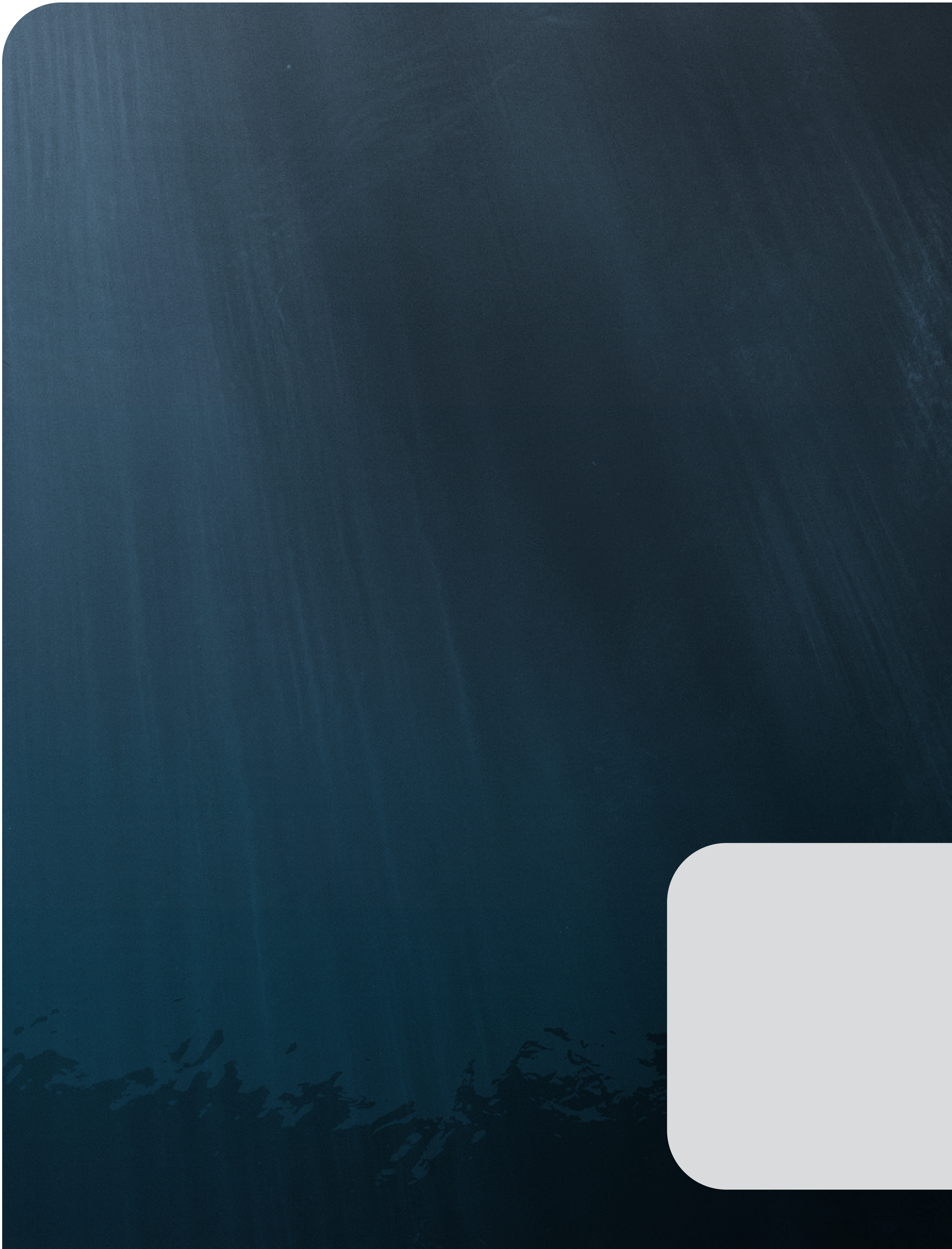

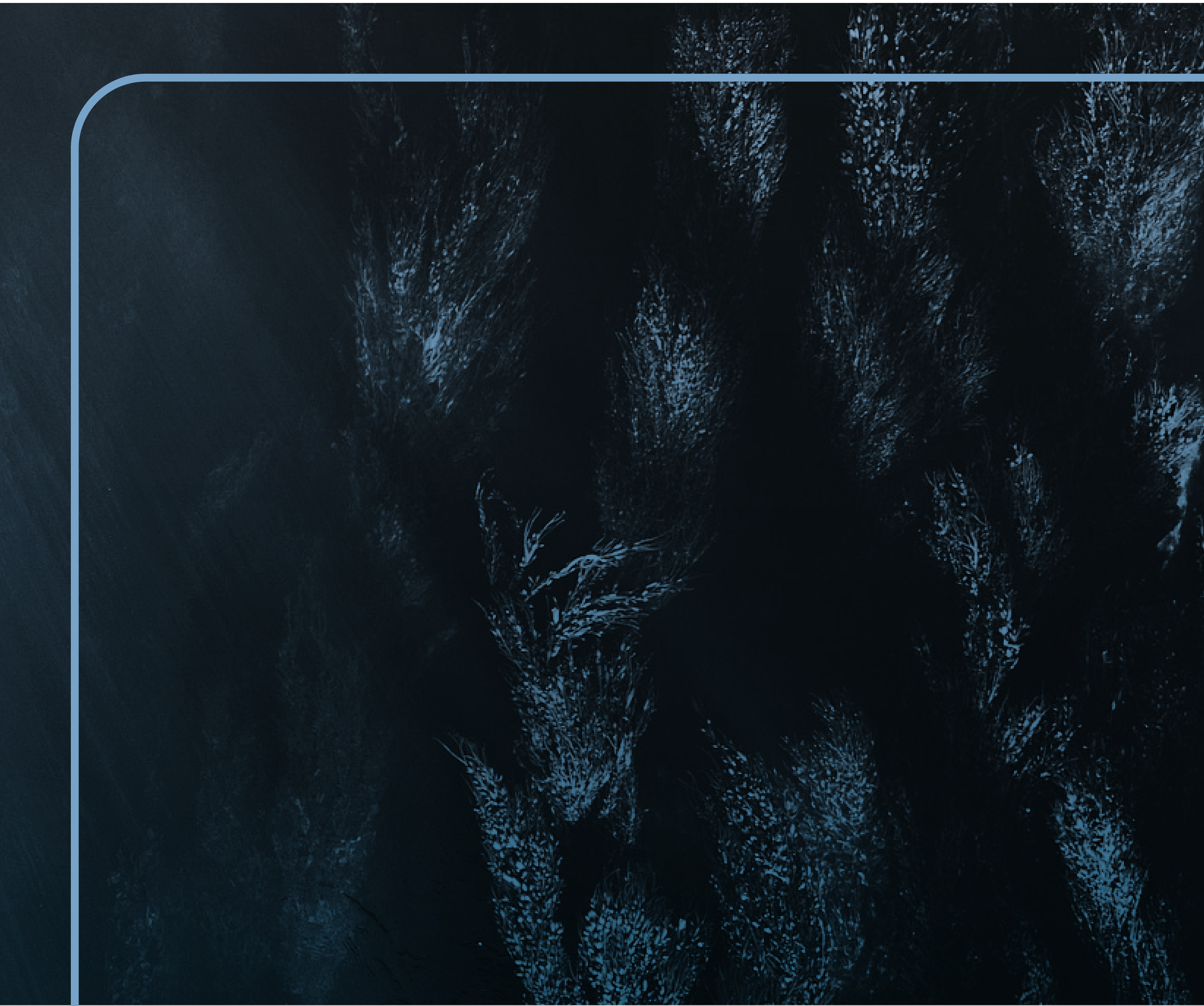

ACRONYMS AND GLOSSARY

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ACRONYMS

ACRONYM	DEFINITION
AIS	Aquatic Invasive Species
AUID	Assessment Unit Identification Number
BMP	Best Management Practice
BWSR	Board of Waters and Soil Resources
CWMP	Comprehensive Water Management Plans
CRP	Conservation Reserve Program
DFC	Desired Future Condition
DNR	Department of Natural Resources
DWSMA	Drinking Water Supply Management Area
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FSA	Farm Service Agency
GPR	Groundwater Protection Rule
GRAPS	Groundwater Restoration and Protection Strategies
HSPF	Hydrologic Simulation Program—Fortran
HUC	Hydrologic Unit Code
IBI	Index of Biological Integrity
IPC	Implementation Planning Committee
JPA	Joint Powers Agreement
JPE	Joint Powers Entity
LGU	Local Government Unit
LiDAR	Light Detection and Ranging
LIWG	Local Implementation Work Group
LSOHC	Lessard-Sams Outdoor Heritage Council
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health

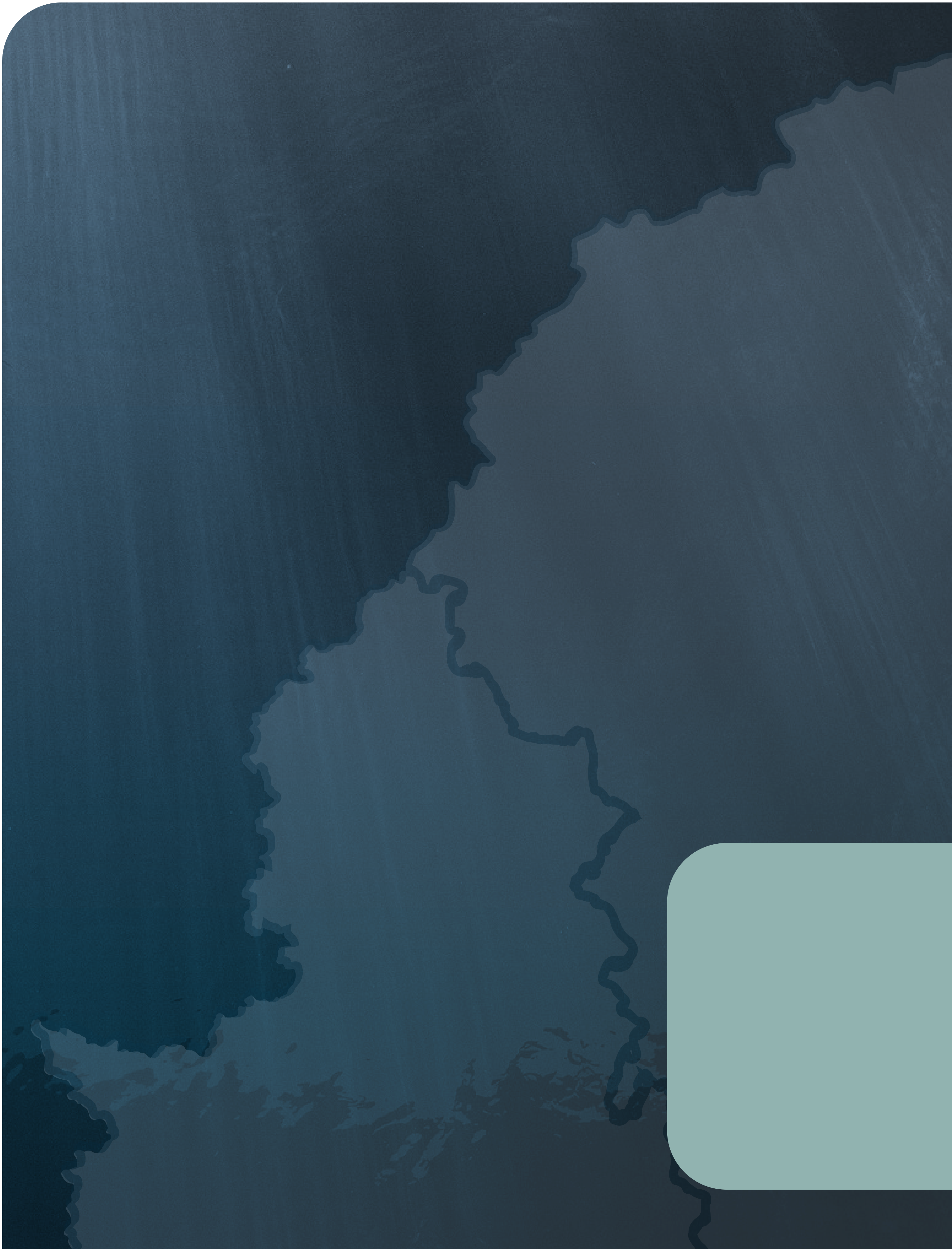
ACRONYM	DEFINITION
MNDNR	Minnesota Department of Natural Resources
MGS	Minnesota Geological Survey
MOA	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRBG	Natural Resources Block Grant
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWS	National Weather Service
O&M	Operation and Maintenance
PAC	Political Action Committee
RIM	Reinvest in Minnesota
SFIA	Sustainable Forest Incentive Act
SSTS	Subsurface Sewage Treatment System
SWA	Subwatershed Assessment
SWCD	Soil and Water Conservation Districts
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
USGS	United States Geological Survey
WASCOB	Water and Sediment Control Basin
WBIF	Watershed-based Implementation Funding
WMO	Wetland Management Organization
WRAPS	Watershed Restoration and Protection Strategies

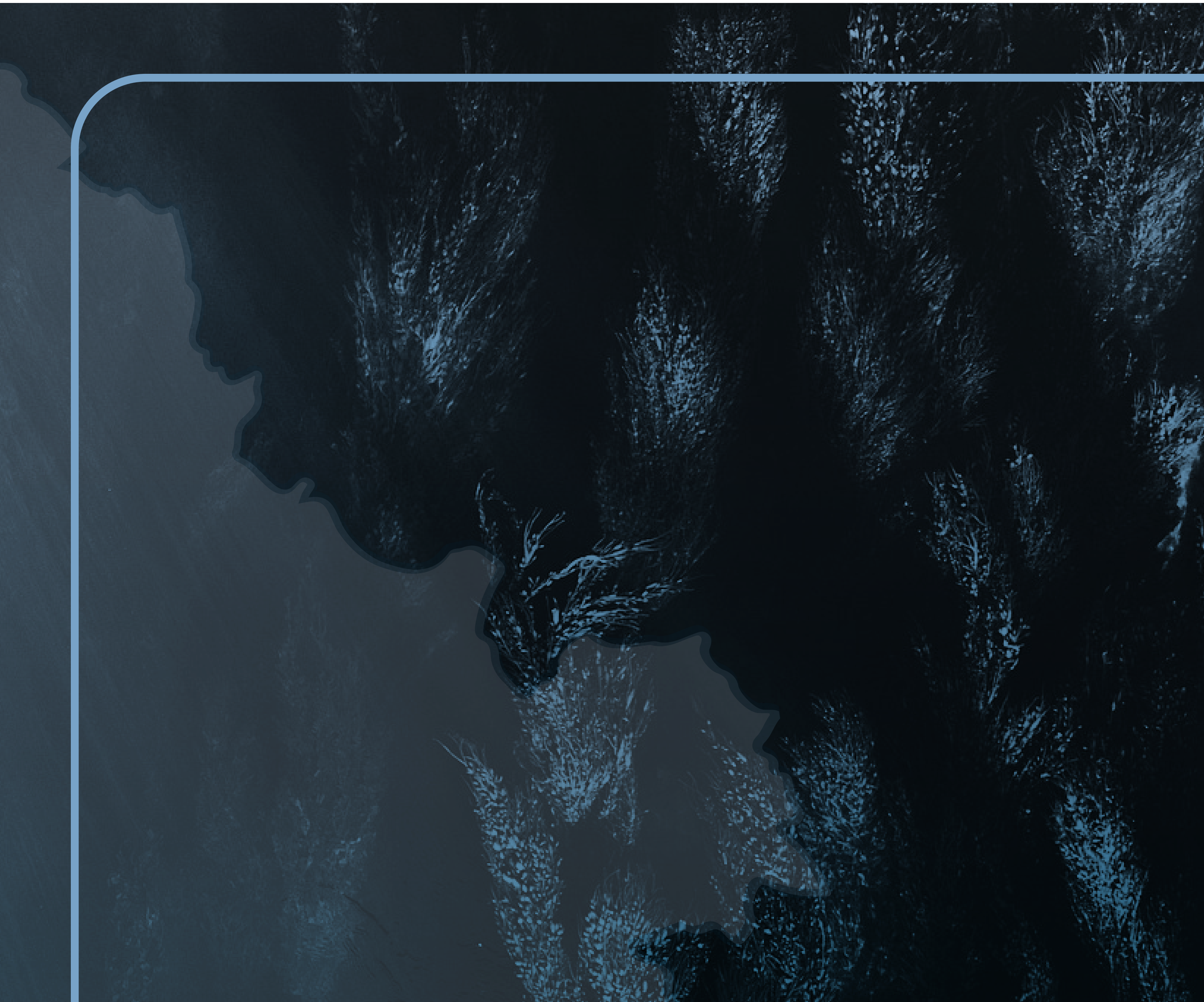
GLOSSARY

TERM	DEFINITION
Desired Future Condition	The long-term outcome or goal; the attributes (water quality, water availability, habitat quality), the Partnership is striving to attain, regardless of the time frame. The desired future condition (DFC) sets the direction for planning and future management. It should be described for priority water resources and reflect stakeholder interests.
Emerging Issue	An issue that lacks the detailed information that is necessary to assess the current or imminent impact to the resources in the Watershed.
Hydrologic Unit Code (HUC):	A Hydrologic Unit Code (HUC) is assigned by the USGS for each watershed. HUCs are organized in a nested hierarchy by size. For example, the Upper Mississippi River Basin is assigned a HUC-4 of 0701.
HSPF (Hydrological Simulation Program – FORTRAN)	A model for simulation of watershed hydrology and water quality for pollutants. This model was run for the Pine River Watershed during the 2017 Watershed Restoration and Protection Strategy (WRAPS).
Impairment	Waterbodies are listed as impaired if they do not meet the state water quality standard for designated uses including aquatic life, aquatic recreation, and aquatic consumption.
Index of Biological Integrity (IBI)	A way of measuring the biological community (fish and aquatic macroinvertebrates) in the water body. The index is a scale of 0 to 100, with 0 being the lowest quality and 100 being the highest quality.
Indicator	A metric, benchmark, or measuring stick used to determine progress towards goals. In some cases, when a metric is not clear or feasible, the indicator might be the number of inputs or outputs themselves.
Judicial Ditch	A ditch that crosses county lines.
Measurable Goal	The 10-year Plan goal; the quantifiable change in resource condition expected after implementation of the 10-year Plan. The measurable goal should relate to the DFC, and express what percent of progress toward the DFC is intended to be made during the Plan period.
Objective	A general result that a person or local government aims to achieve, relative to a specific issue, within a time frame and with available resources.
Outcome	The specific result of an implementation activity. Collectively, the outcomes from Plan activities should achieve the stated measurable goals. Outcomes may also express changes in knowledge or behavior which lead to actions that contribute to measurable goals.
Output	Countable projects, activities, services, or products. These are often referred to as 'widgets' and are the countable items that are useful for tracking the steps towards achieving the goals. Outputs are not goals in and of themselves because they do not quantify a change in the resource condition.
Prioritize	Determining the relative importance and precedence of the resources and issues in the Watershed.
Priority Issue	The agreed upon issues that are identified as the focus of the Plan through a prioritization process.

TERM	DEFINITION
Protect (Management Focus)	A minor or subwatershed where the natural resources are generally in good condition, risks to natural resources are low, and the management focus is to maintain and increase protection levels with strategies, such as private forest stewardship and conservation easements.
Protected	Protected land uses include public lands, public waters, wetlands on private lands, buffers required through the buffer law, easements, other conservation lands, Sustainable Forest Incentive Act (SFIA). The SFIA provides annual incentive payments to encourage private landowners to keep their wooded areas undeveloped. Private landowners can receive a payment for each acre of qualifying forest land they enroll in SFIA.
Protection	This term is used to characterize actions taken in watersheds of waters, not known to be impaired, to maintain or improve conditions and beneficial uses of the waterbodies.
Restoration	This term is used to characterize actions taken in watersheds to improve conditions, and in impaired watersheds to eventually meet water quality standards and achieve beneficial uses of the waterbodies.
Resource	A natural, economic, biotic, aesthetic, or similar asset. Resources are generally considered something that can be 'managed' and are generally broad, such as surface water or groundwater.
Resource Concern	A physical, biological, chemical, or geological subset or component of a resource. Resource concerns are typically a refinement of a resource. For example, the resource surface water can be refined into several resource concerns, including streams, lakes, rivers, and wetlands.
Resource Goals	Specific goals related to an individual resource need.
Silvopasture	The deliberate integration of trees and grazing livestock operations on the same land. These systems are intensively managed for both forest products and forage, providing both short- and long-term income sources.
Source (or Pollutant Source)	This term is distinguished from 'stressor' to mean only those actions, places or entities that deliver/discharge pollutants (e.g., sediment, phosphorus, nitrogen, pathogens).
Strategy	A chosen approach that a person or local government implements to meet the objective.
Stressor (or Biological Stressor)	This is a broad term that includes both pollutant sources and non-pollutant sources or factors (e.g., altered hydrology, dams preventing fish passage) that adversely impact aquatic life.

TERM	DEFINITION
Target	There are three facets to targeting implementation activities: • Activity type • Timing • Location Activity type The Best Management Practices (BMPs), conservation practices, outreach and education, monitoring, technical assistance or other action that will be the most effective in addressing the prioritized issues. Timing The scheduling of implementation activities across the 10-year Plan period, based on which priority issues will be addressed in which order. Location The area where a specific activity will be implemented to address a priority issue. Sometimes, the location of the implementation activity will not be the same location of the priority resource that is being addressed. For instance, reducing sediment concentrations in the main stem of a river may require actions to be taken at the headwaters of minor watersheds.
TMDL (Total Maximum Daily Load)	The amount of a particular pollutant that a body of water can handle without violating state water quality standards.
Watershed	A land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.
WRAPS (Watershed Restoration and Protection Strategy)	A watershed approach to restoring and protecting Minnesota's rivers, lakes, and wetlands implemented by the Minnesota Pollution Control Agency on a 10-year cycle (https://www.pca.state.mn.us/water/watershed-approach-restoring-and-protecting-water-quality).





EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Shell Rock River-Winnebago River Comprehensive Watershed Management Plan (Plan) is a unifying strategy for water management in the Shell Rock River and Winnebago River watersheds (planning area). It was developed by, and will be implemented by, local government units across the planning area, as well as their partners from state and federal agencies, non-profits, citizens, and other stakeholders. The Plan focuses on restoring impaired waters and habitat, reducing erosion, improving soil health, reducing impacts from flooding, protecting high quality habitat, and protecting groundwater quality through holistic management.

VISION STATEMENT

Improved natural resources through collaborative action.

PLANNING AREA OVERVIEW

The planning area includes two major watersheds, the Shell Rock River and Winnebago River, and is located in south-central Minnesota (Figure 0-1). The planning area is 317 square miles with the Shell Rock River Watershed covering 246 square miles and the Winnebago River Watershed covering 71 square miles. The Shell Rock River and Winnebago River watersheds, excluding 0.3 square miles, are within Freeborn County. The Shell Rock River begins at the outlet of Albert Lea Lake and flows for roughly 12 miles to the Iowa border. While a portion of the Winnebago Watershed, including its headwater tributaries, is in Minnesota, the Winnebago River starts in Iowa. The watersheds are primarily agricultural and are extensively drained. There are no sections of natural stream left in the Winnebago Watershed in Minnesota. Central to the Shell Rock River Watershed, Albert Lea is the largest city in the planning area.

Planning Terminology

A set of planning terms were adopted at the beginning of the planning process to ensure consistency and application of planning terms. These definitions are provided throughout the Plan.

MEASURABLE GOAL (N.)

The 10-year Plan goal; the quantifiable change in resource condition expected after implementation of the 10-year Plan. The measurable goal relates to the desired future condition (DFC) and expresses the progress toward the DFC that is intended to be made during the plan period.

TARGET (N.)

There are three facets to targeting implementation activities:

Activity Type
The BMPs, conservation practices, outreach and education, monitoring, technical assistance or other actions that will be the most effective in addressing the prioritized issues.

Timing
The scheduling of implementation activities across the 10-year plan period, based on which priority issues will be addressed and in which order.

Location
The area where a specific activity will be implemented to address a priority issue. In some cases, the location of the implementation activity will not be the same location of the priority resource that is being addressed. For instance, reducing phosphorus concentrations in a lake will require actions to be taken in areas throughout the drainage area.

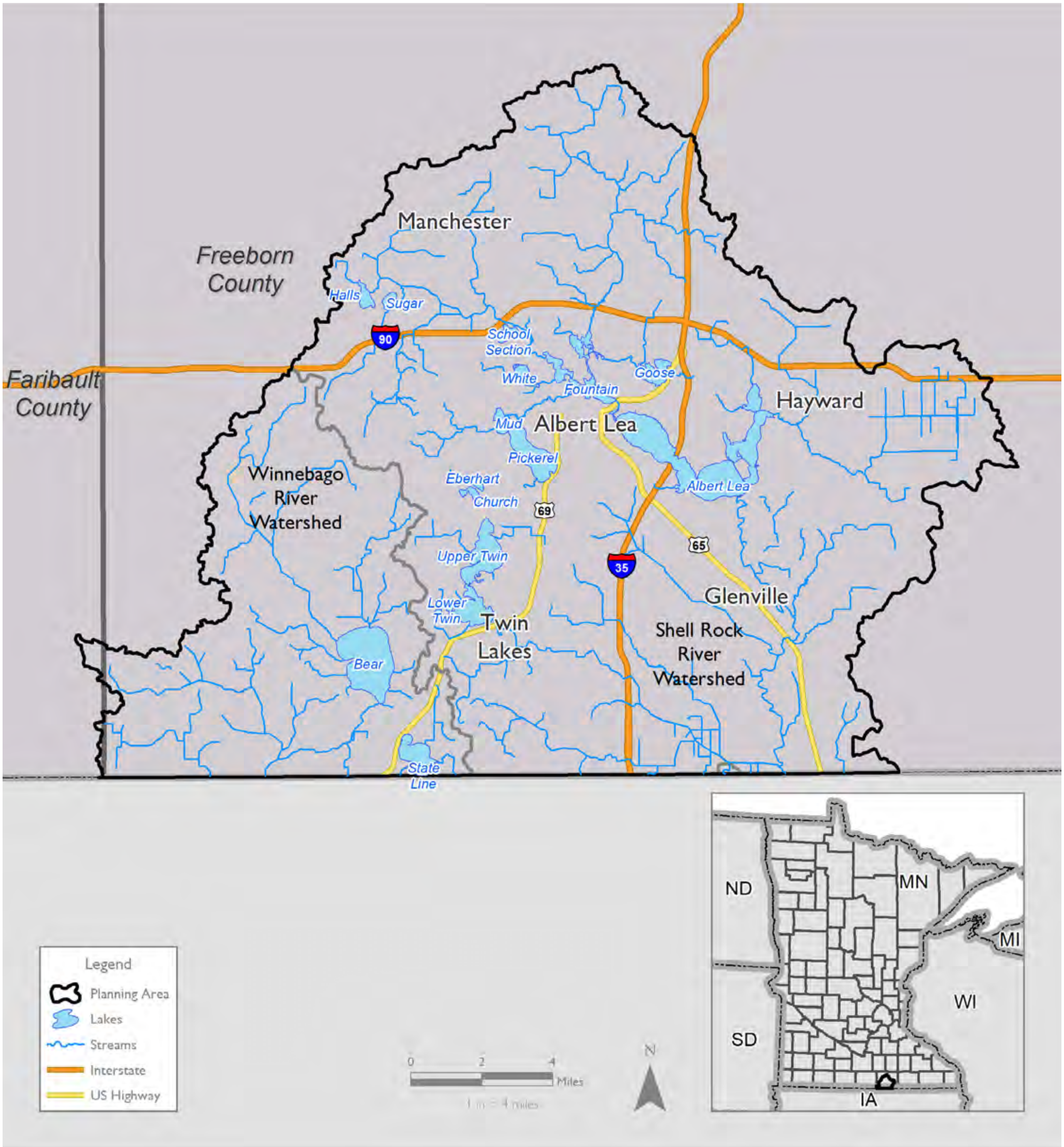


Figure 0-1: Planning Area

PLANNING MANAGEMENT ZONES

The planning area is divided into four management zones (Figure 0-2). These zones were developed during the planning process based on the drainage areas to major waterbodies in both watersheds. Table 0-1 below describes key characteristics of each management zone.

Table 0-1: Planning Management Zones

MANAGEMENT ZONE	CHARACTERISTICS
Fountain Lake	The headwaters of Shell Rock River Watershed that drains to Fountain Lake and has the most lakes of any management zone. The drainage area is made up of three main tributaries: Bancroft Creek, Wedge Creek, and Shoff Creek.
Albert Lea Lake	The drainage area to Albert Lea Lake that excludes the Fountain Lake drainage area. The major tributary is Peter Lund Creek to the east of the lake.
Shell Rock River	The entire drainage area downstream of Albert Lea Lake and includes Upper and Lower Twin Lakes.
Winnebago River	The entire Winnebago River Watershed in Minnesota and drainage ditches that flow through Bear Lake and State Line Lake that flow into Iowa and eventually the Winnebago River.

PARTICIPATING LOCAL GOVERNMENTS

The local government units (LGUs) involved in managing the Shell Rock River Watershed and Winnebago River Watershed resources recognized that BWSR's One Watershed, One Plan (1W1P) program provided a unique opportunity to develop a comprehensive watershed management plan (CWMP) that unifies and accelerates the restoration of degraded resources and protection of high-quality resources. The Shell Rock River Watershed District (SRRWD), Freeborn County, the Freeborn County Soil and Water Conservation District (SWCD), and the city of Albert Lea recognized the need to increase coordination, reduce potential duplication of activities, and provide greater assurances for meeting goals and measurable outcomes.

The Plan Steering Committee (membership listed in Appendix A) was established and worked collaboratively to develop and submit a response to a BWSR-generated Request for Qualifications. Upon BWSR nomination and funding approval, the collaborative arrangement was formalized through a Memorandum of Agreement (MOA) and subsequent bylaws that were approved. The MOA was entered into by the Shell Rock River Watershed District, Freeborn County, Freeborn County SWCD, and the City of Albert Lea. A small portion (<1%) of the watershed is in Faribault County. The County elected not to participate because of the small geographic area the County has in the planning area. Participation in the 1W1P is not required if less than five percent of the jurisdictional land area of the local government is within the planning area. Figure 0-3 shows the jurisdictional boundaries in the planning area. The percentage of each entity and the water plan that each entity is currently operating under is provided in Table 0-2.

Table 0-2: Status of the Water Plans in the Planning Area

% IN PLANNING AREA BOUNDARY	LOCAL GOVERNMENT UNIT/ENTITY NAME	PLAN NAME	PLAN START	PLAN EXPIRATION
100%	Shell Rock River Watershed District	2014 Second Generation Water Management Plan	2015	-
100%	City of Albert Lea and Shell Rock River Watershed District	Albert Lea Lake Draft Watershed Management Plan	2010	-
44%	Freeborn County (adopted by SWCD)	Freeborn County Comprehensive Water Plan	2016	2021

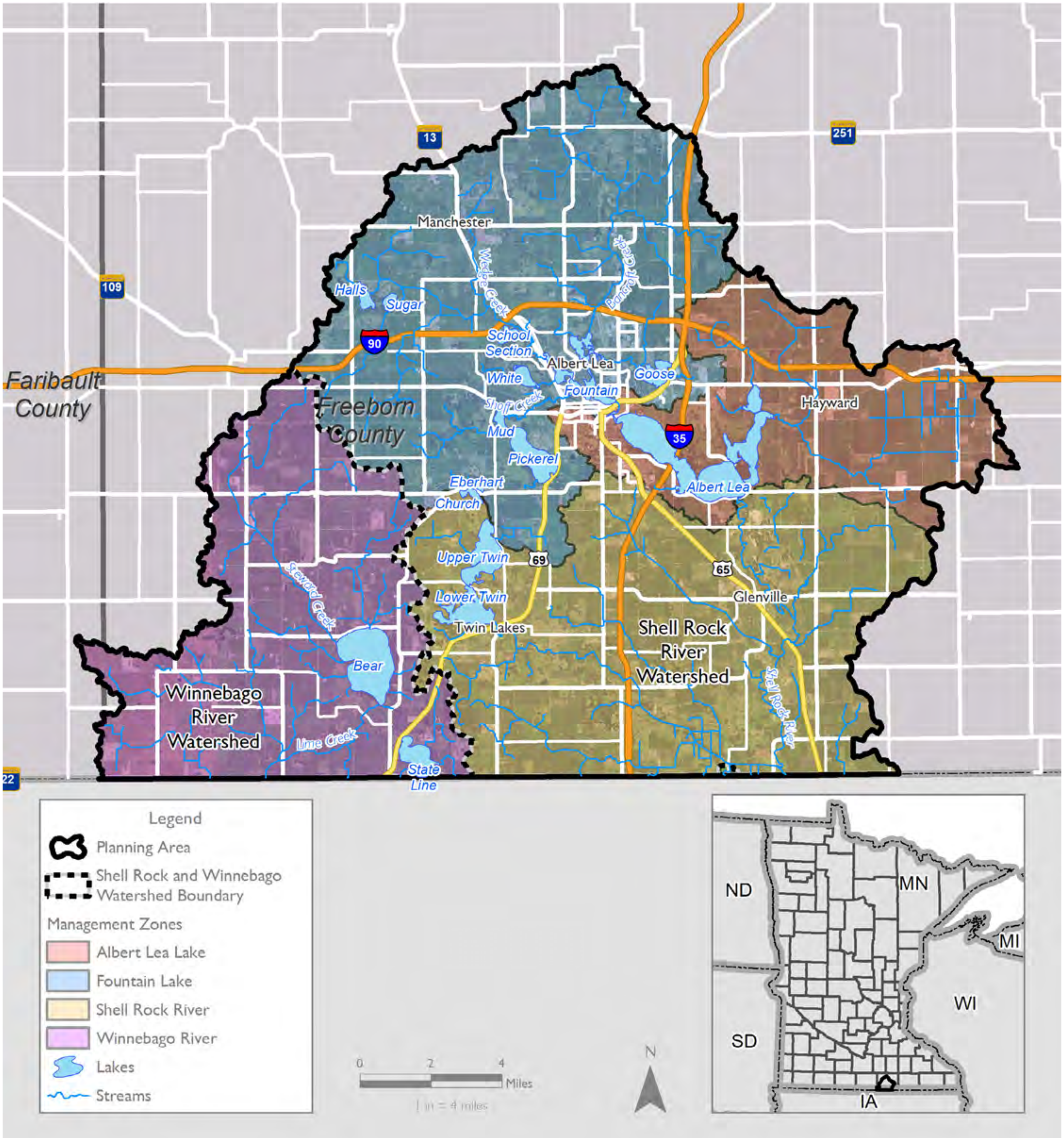


Figure 0-2: Plan Management Zones

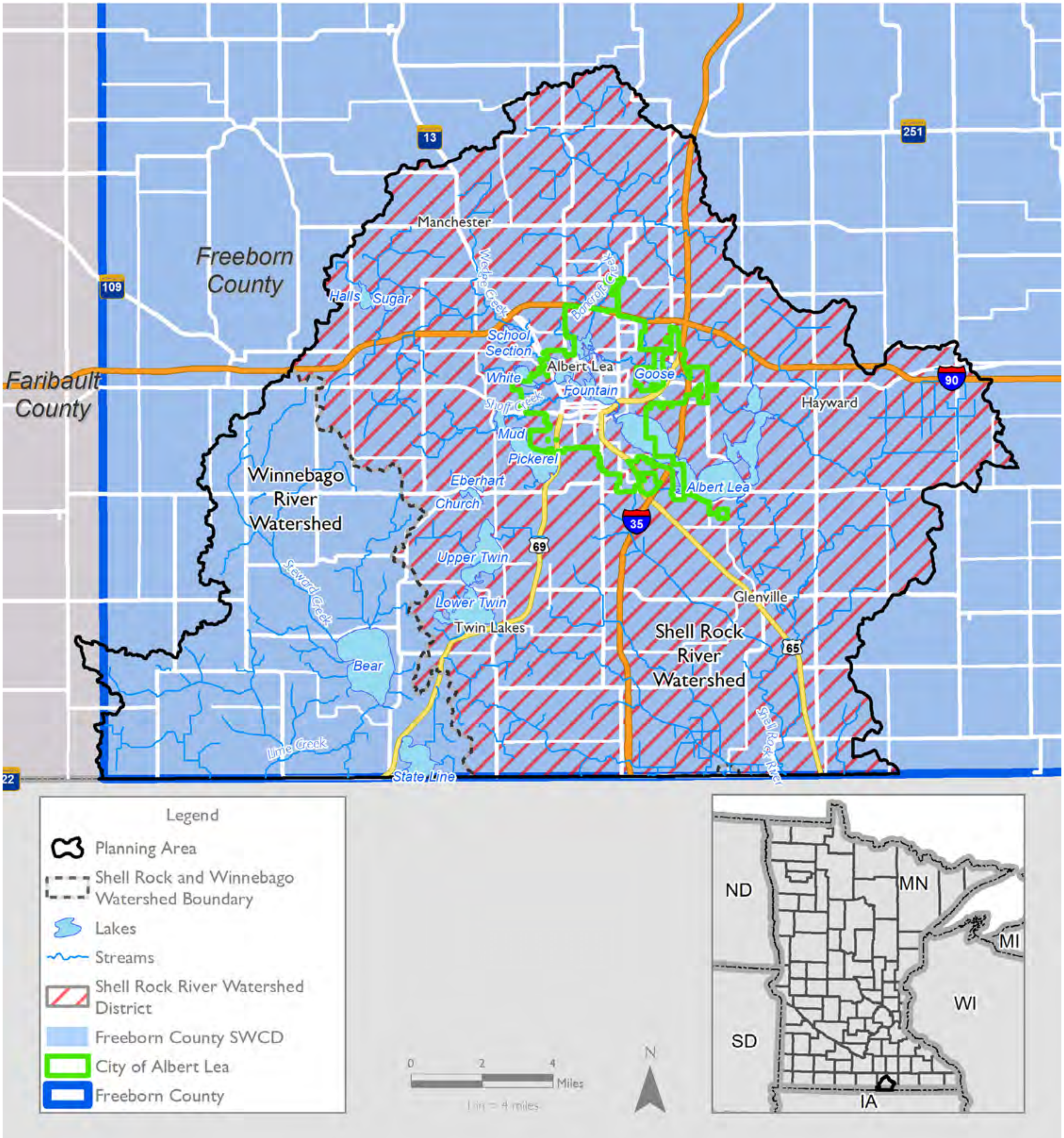


Figure 0-3: Jurisdictional Boundaries in the Planning Area

ROLES AND RESPONSIBILITIES

The development of the Plan was a collaborative effort by all members of the Partnership. Three committees were established to facilitate the creation of plan content as well as manage day-to-day operations. Committee membership is detailed in Appendix A.

Figure 0-4: These committees were created by the Partnership to develop the Plan.

COMMUNITY ENGAGEMENT

Public Notices

This Plan is governed by Minnesota Statute 103B. To fulfill all statutory requirements for noticing, public notices were published in each local government's designated legal newspaper. The official 60-day public notice and comment period began on April 25, 2019 and ended on June 24, 2019. In total, five comment letters were received (see Appendix B). A final public notice and comment period was held from November 1, 2021 through December 31, 2021.

Workshops

The partnership held a public kickoff event to gather stakeholder input to share their concerns and water-related goals. The event was held at the Edgewater Bay Pavilion in Albert Lea on August 21, 2019. The input gathered at this event was added to a set of spreadsheets to capture the information and concerns expressed by stakeholders. This information was used as the starting point to begin the process of selecting priority issues and filtering it into a working plan. The spreadsheet with the stakeholder input can be found in Appendix C. While the overall planning process was iterative at times, the planning group filtered the long list of stakeholder issues and turned them into specific actions and goals.

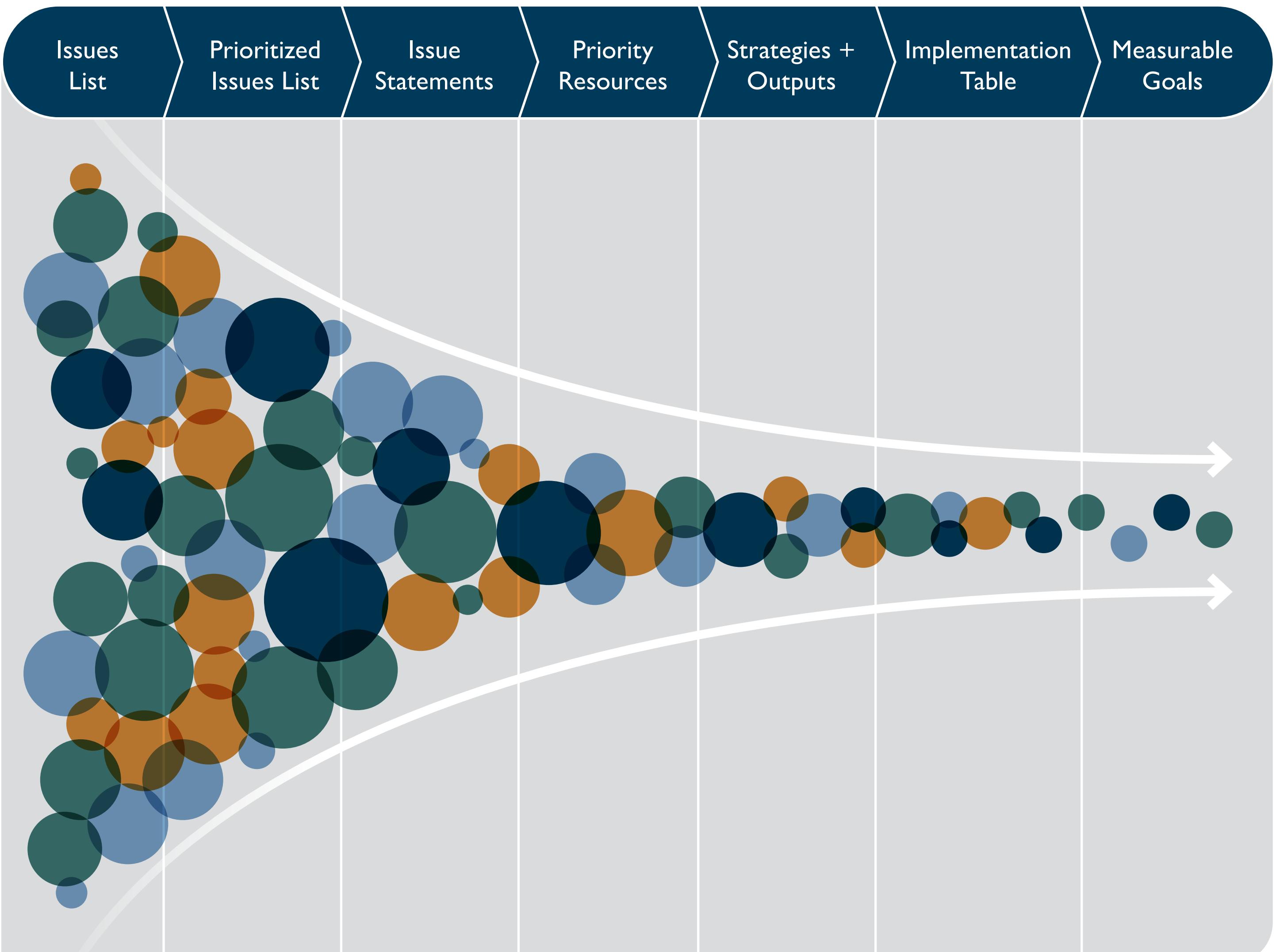


Figure 0-5: Planning Process

PRIORITIZED ISSUES LIST

The issues for the Plan were generated and prioritized with input from the general public, Steering Committee, Advisory Committee, state agencies, and existing local management plans.

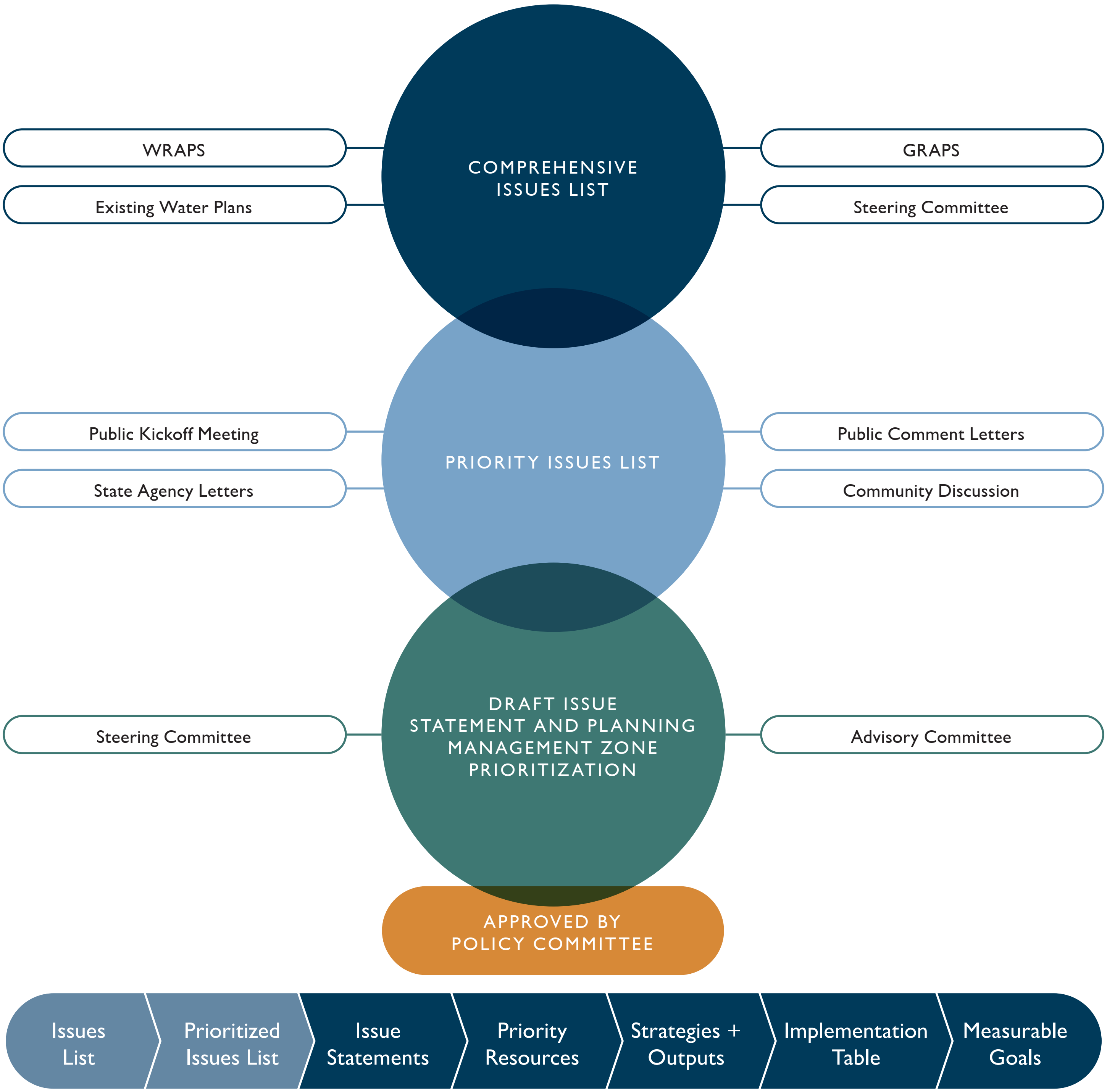


Figure 0-6: Prioritization Issues List

RESOURCE CATEGORIES

All of the comments and data that were gathered during the data aggregation process were grouped according to the type of resource the data concerned. There were three broad resource types: surface water, groundwater, and natural resources. Within each resource type, data was categorized according to major themes, such as the quality or quantity of the resource. Finally, each comment and data point was further classified as a value, concern, or strategy.

The values and concerns for each resource category were considered in drafting the issue statements. Strategies were considered after the preliminary goals were established.

SURFACE WATER

Surface water issues were categorized by water quantity, water quality, and restoration.

GROUNDWATER

Groundwater issues were categorized by drinking water and groundwater quality, and knowledge and data regarding groundwater.

NATURAL RESOURCES

Natural resource issues were categorized by habitat, invasive species, and protection, management, and restoration of habitat.

PRIORITY ISSUE STATEMENTS AND GOALS

Ten draft issue statements addressing surface water, groundwater, and natural resource categories were developed by the Steering Committee. These issue statements were refined through input from the Advisory Committee then finalized and ranked according to priority order.

Goals for each issue statement were established to guide the development of strategies and implementation action items. A review of previous studies and existing resources was conducted to build a draft list of strategies and implementation actions. This list was reviewed along with the issue statements to determine what additional strategies and implementation actions were needed to fully address the priority issue statement goals. This process led to a final list of strategies and implementation actions that would be used to develop the measurable outcomes. The Hydrologic Simulation Program – Fortran (HSPF) watershed model and spreadsheet targeting tool (described in Chapter 4) provided the Partnership with the necessary tool to simulate the impacts of their selected implementation actions and develop numeric measurable outcomes. Existing and desired level of effort was used for measurable outcomes that lack appropriate models or studies to quantify, such is the case with outreach and education, as well as groundwater quality actions. Once the implementation tables were assembled, the goals and measurable outcomes were refined to better align with the anticipated level of effort and expected funding levels for each action item. Measurable goals presented represent the target outcome for the 10-year planning period..

As the Partnership moved through the process of developing and refining the implementation tables, it became increasingly evident that to maintain the overarching goal of developing a realistic and achievable plan they would need to develop multiple funding tiers. The funding tiers allowed the planning team to keep the implementation plan and measurable outcomes focused on attainable results while still including higher cost projects that may have a lower likelihood of being funded, As a result, the Partnership established a truly comprehensive plan. Details for each priority issue and targeting approach are provided in Chapters 3 and 4.

LEVEL A PRIORITY ISSUES

A1: SURFACE WATER QUANTITY	
Issue Statement	Landscape and channel alterations have caused adverse impacts to hydrology such as localized flooding. There is a risk of increased flooding due to inadequate storage and this risk is compounded due to increased rates of extreme weather events.
Desired Future Condition	Eliminate localized flooding during extreme weather events.
Goal 1	Increase water storage to reduce downstream impacts.
Measurable Outcome	Implement projects that store 6,247 acre-feet over the 10-year planning period.
Goal 2	Reduce the frequency and intensity of flooding.
Measurable Outcome	Locations and duration of flooding in the City of Albert Lea will be documented. Building a record of localized flooding events will lead to a better understanding, helping to drive future management decisions and ultimately lead to a reduction in flooding incidents.

A2: SURFACE WATER QUALITY

Issue Statement	Lakes and streams are threatened or impaired due to excess pollution, including nutrients, sediment, and bacteria. These pollutants can cause eutrophication, impact aquatic life, and decrease recreational use opportunities.
Desired Future Condition	All lakes and streams meet or exceed MPCA standards for aquatic life and recreational use.
Goal 1	Improve lake water quality by decreasing total phosphorus concentrations.
Measurable Outcome	Average summer total phosphorus (TP) concentrations will be reduced to 207 ug/L for Albert Lea Lake, 143 ug/L for Pickerel Lake, 256 ug/L for Fountain Lake West, and 244 ug/L for Fountain Lake East while current TP concentrations will be maintained for the remaining lakes.
Goal 2	Improve stream water quality by reducing E. coli, nutrient, and TSS source loading and implementing practices that reduce flow alteration.
Measurable Outcome	Replace or upgrade 40 failing or non-compliant septic systems.
	Bring three feedlots into compliance with existing regulatory requirements
	Ensure feedlots that are expanding maintain necessary management practices.
	Minimum daily dissolved oxygen (DO) concentrations will be above 5 mg/L and mean growing season DO flux will stay below 5 mg/L for stream reaches with current monitoring.
	Achieve TP and TSS pollutant reductions at outlets to Tier 1 priority lakes as shown in Table 3-2. The actions called for in the implementation schedule to address TP and TSS will also treat Total Nitrogen (TN). The MPCA's nitrogen reduction goals are summarized in the respective watersheds WRAPS reports and call for a 45% reduction in TN in the Shell Rock River watershed (by 2040) and a 20% reduction in TN in the Winnebago River watershed (by 2030).

Table 3-2: Major Outlets to Top Priority Lakes

STREAM NAME	MANAGEMENT ZONE	PRIORITY STREAM DUE TO: E. COLI IMPAIRMENT	PRIORITY STREAM DUE TO: OUTLETS TO TIER 1 PRIORITY LAKE	RECEIVING PRIORITY LAKE	EXISTING TP LOAD (LBS/YR)	TP REDUCTION (LBS/YR)*	EXISTING TSS LOAD (TONS/YR)	TSS REDUCTION (TONS/YR)*
Wedge Creek	Fountain Lake	●	●	Fountain Lake	16,845**	1,222 (7%)	1,478***	224 (15%)
Bancroft Creek	Fountain Lake	●	●	Fountain Lake	17,748**	1,434 (8%)	1,425***	237 (17%)
Shoff Creek	Fountain Lake		●	Fountain Lake	4,810**	535 (11%)	500***	87 (17%)
Peter Lund Creek	Albert Lea Lake		●	Albert Lea Lake	13,003**	1,177 (9%)	792***	142 (18%)
Shell Rock River	Shell Rock River	●		N/A	132,042***	3,978 (3%)	8,641***	116 (1%)
Lime Creek	Winnebago River	●		N/A	8,316***	513 (6%)	3,253***	71 (2%)
				Total	**192,764**	**8,860 (5%)**	**16,089**	**877 (5%)**

*Reductions calculated from spreadsheet targeting tool and calibrated HSPF model.
** Existing loads are from approved 2021 TMDL
***Existing loads are from calibrated HSPF Model

LEVEL B PRIORITY ISSUES

B1: EROSION AND SEDIMENT CONTROL

Issue Statement	Increased and accelerated runoff have caused elevated or fluctuating water levels which result in shoreland and streambank erosion. There is increased erosion and sedimentation issues from streambanks and shoreland areas, as well as from land management practices. These impacts may be compounded due to increased rates of extreme weather events.	
Desired Future Condition	Excessive erosion and sedimentation is controlled.	
Goal 1	Reduce overland runoff.	
Measurable Outcome	Implement urban stormwater management practices in the City of Albert Lea over the 10-year plan period.	Install a minimum of two raingardens.
		Install a minimum of two retention ponds.
		Install a minimum of two stormwater ponds.
		Replace two sweeper units.
	TSS reductions achieved through implementing BMPs that address Issue Statements A1 and A2.	
	Increase and promote stormwater management (i.e. street sweeping) in smaller urban areas through outreach and education.	
Goal 2	Reduce shoreline and streambank erosion.	
Measurable Outcome	Stabilize a minimum of 9,800 linear feet of eroding and failing streambanks and shoreline and complete inventory of failing streambanks.	

B2: PROTECT SOIL HEALTH

Issue Statement	Degraded soil health conditions have resulted in reduced agricultural production, decreased nutrient and water holding capacity, decreased infiltration, and increased erosion across the landscape.
Desired Future Condition	Implement practices to improve soil health which will lead to increased agricultural production, increased nutrient and water holding capacity, increase infiltration, and decrease erosion. Adopting practices to increase soil health such as planting cover crops, practicing reduced or no tillage, crop rotations, and rotational or prescribed grazing will help achieve the five soil health principals: soil armoring, minimizing soil disturbance, plant diversity, continual live plant/root, and livestock integration.
Goal 1	Better understand current implementation of soil health practices in the planning area.
Measurable Outcome	Identify and quantify the existing efforts to improve soil health across the planning area, which includes implementation of cover crops, or no-till practices, to establish a baseline level of implementation. Outreach and education efforts to inform landowners of soil health practices and opportunities will continue (one winter workshop, one fall field day, 12 posts on social media per year, enter information into Farming in the Heartland twice a year, provide No-Till Farmer Online/Magazine subscriptions to local landowners).
Goal 2	Increase the number of soil health practices on agricultural land.
Measurable Outcome	9,984 acres of newly implementing soil health practices.

LEVEL C PRIORITY ISSUES

C1: PROTECT SITES OF HIGH ECOLOGICAL VALUE	
Issue Statement	The remaining sites of high ecological value are at risk of degradation and may need protection and enhancement
Desired Future Condition	Significant portions of native habitat have been restored. Resources of high ecological value are protected and expanded.
Goal 1	Protect and enhance outstanding, high, and moderate biologically significant areas in the Shell Rock–Winnebago River Watershed.
Measurable Outcome	Enhance at least 190 acres of biologically significant areas and expand protected area adjacent to biologically significant areas.

C2: RESTORE WETLAND AND UPLAND HABITAT	
Issue Statement	Land use alterations have reduced, degraded, and decreased the quality and abundance of upland and wetland habitat .
Desired Future Condition	Significant portions of upland and wetland areas are restored.
Goal 1	Restore altered wetlands and degraded upland habitat.
Measurable Outcome	Restore 1,728 acres of upland habitat.
	Restore 1,245 acres of wetland habitat.

C3: GROUNDWATER QUANTITY AND QUALITY	
Issue Statement	Groundwater and drinking water supplies are threatened by human actions as well as naturally occurring contaminants. There may be areas that have low groundwater volume which could be impacted by high capacity wells.
Desired Future Condition	To have sustainable, drinkable groundwater.
Goal 1	Reduce the risk of groundwater contamination.
Measurable Outcome	Replace and upgrade 40 failing or non-complaint septic systems.
	Bring three feedlots into compliance with existing regulatory requirements.
	Ensure feedlots that are expanding maintain necessary management practices.
	Seal 5 unused or abandoned private wells per year.
	Provide outreach and education to increase awareness on Arsenic in groundwater.

LEVEL D PRIORITY ISSUES

D1: IMPROVE DEGRADED AQUATIC HABITAT	
Issue Statement	Fish and macroinvertebrate populations are threatened by a lack of habitat, poor biological quality, channelized streams, altered hydrology, and poor water quality due to high sediment loading and algal blooms.
Desired Future Condition	Habitats that fully support fish and macroinvertebrate communities.
Goal 1	Restore aquatic habitat.
Measurable Outcome	Implement projects targeting biologically impaired stream reaches that address causes identified in Stressor I.D. report.
	Restore habitat in ten shallow lakes.
	Restore habitat in Fountain Lake through dredging and creating in-lake habitat structures.
	Outreach and education on shoreland management and benefits of maintaining buffer along shoreline.
Goal 2	Manage carp population, abundance, and distribution.
Measurable Outcome	Maintain carp so they do not exceed desirable levels (100kg/hectare).
Goal 3	Enhance and restore native aquatic vegetation.
Measurable Outcome	Increased seeding and planting of native plant during restoration. Increased outreach and education impacts from certain water recreation sports.

D2: INVASIVE SPECIES	
Issue Statement	Invasive species threaten the health and quality of upland, wetland, riparian, and aquatic ecosystems. Invasive species need to be controlled to reduce their impact.
Desired Future Condition	Invasive species have been controlled and no longer impact native ecosystems.
Goal 1	Reduce aquatic invasive species impact to waterbodies.
Measurable Outcome	Manage aquatic invasive species in lakes, such as Carp, when identified.
	Outreach and education events on invasive species management (educate on all aquatic invasives).
Goal 2	Reduce the area of wetland and upland impacted by invasive species .
Measurable Outcome	Implement one invasive species management plan to reduce impacts from invasive species.
Goal 3	No newly detected invasive species will become established.
Measurable Outcome	Maintain aquatic invasive species watercraft inspections.
	Establish an early detection and rapid response plan for Fountain Lake.
	Share aquatic invasive species topics monthly via watershed districts Facebook page and information in watershed districts email chain three times per year.

LEVEL E PRIORITY ISSUES

E1: GROUNDWATER PROTECTION	
Issue Statement	Groundwater recharge areas (and particularly coarse textured soils) of the watershed within the planning area are vulnerable to contamination and need to be protected; stakeholders need to have a greater understanding of groundwater resources.
Desired Future Condition	Increase protection in known highly vulnerable areas, improve understanding of groundwater resources, and increase educational opportunities to help public better understand their role in improving their drinking water resources.
Goal 1	Protect known highly vulnerable areas in Figure 1-8.
Measurable Outcome	Land use risk within highly vulnerable areas is reduced by 1370 acres through conversion to permanent protection or implementation of cover crops.
Goal 2	Enhance and collaborate with existing wellhead protection planning efforts.
Measurable Outcome	Support MDH's efforts to establish wellhead protection areas for two communities.
Goal 3	Increase understanding of groundwater resources and human influences.
Measurable Outcome	Develop a County Geologic Atlas for Freeborn County and increase public awareness of human influences on groundwater quality.
	Track Nitrate test results above 3.0 mg/L.
	Ammonia levels in groundwater used for drinking water in the City of Albert Lea do not exceed 0.2 mg/L.

RESOURCE (N.)

A natural, economic, educational, biotic, aesthetic or similar asset. Resources are generally considered something that can be 'managed' and are generally broad, such as surface water, groundwater, or education and outreach.

RESOURCE ISSUE (N.): A factor, stressor or difficulty resulting in an adverse consequence for a resource concern. A resource concern can have one or many issues.

Resource Concern (n.): A physical, biological, chemical, or geological subset or component of a resource. Resource concerns are typically a refinement of a resource.

OUTPUT (N.)

Countable projects, activities, services, or products. These are useful for tracking the steps toward achieving the goals. Outputs are not goals in and of themselves because they do not quantify a change in the resource condition.

EMERGING ISSUE (N.)

An issue that lacks the detailed information that is necessary to assess the current or imminent impact to the resources in the Shell Rock River and Winnebago River watersheds.

IMPLEMENTATION ACTIONS AND PROGRAMS

The activities that will be undertaken to address the priority issues identified in this plan and Table 0-3. These actions are not meant to be all encompassing, rather a list of the specific actions that will be implemented to meet the plan's measurable goals. Additionally, each action is categorized according to the targeted priority issue. Since many actions provide multiple benefits, categorization includes a rank that describes the degree to which the action addresses a priority issue according the description below:

1 = Primary Benefit   2 = Secondary Benefit   3 = Tertiary Benefit

- 1 Primary: Indicates the action is directly addressing that issue
- 2 Secondary: Indicates the action may not be targeted for the issue but provides benefits
- 3 Tertiary: Indicates the action provides a minimal benefit

Progress toward measurable outcomes will be evaluated by documenting annual workplan accomplishments. Progress toward overall goal achievement will include tracking numerical goals, such as the number of septic system fixes; estimating pollution reductions using the spreadsheet tool; or verifying outcomes using evidence-based data collection.

PLAN APPROVAL PROCESS

After completing the draft plan, the formal review process begins and must be conducted in accordance with Minnesota Statute 103B.315 (1990 as revised in 2003). The Policy Committee must approve the draft and initiate the formal notice, comment period, and process. The draft document must be submitted to the plan review authorities who have 60 days to submit comments to both the Policy Committee and to BWSR. The Policy Committee will schedule and hold a public hearing no sooner than 14 days after the 60-day review period ends. After the public hearing, the Policy Committee must submit the draft final plan, along with a summary of all comments received, the response to each comment, and additional public hearing details to BWSR. BWSR must complete its review and approval within 90 days after receiving the Plan. Once BWSR has approved the Plan, it must be adopted by the local governments that are included in the MOA within 120 days.

Table 0-3: Implementation Actions and Issues Addressed

	Surface Water A1: Quantity	Surface Water A2: Quality	Surface Water B1: Erosion and Sediment Control	Natural Resources B2: Protect Soil Health	Natural Resources C1: Protect High Ecological Value	Natural Resources C2: Restore Wetland and Upland Habitat	Groundwater C3: Groundwater Quantity and Quality	Natural Resources D1: Improve Degraded Aquatic Habitat	Natural Resources D2: Invasive Species	Groundwater E1: Groundwater Protection
Cover Crops	1	1	1	1			2			1
Wetland Restoration	1	1	1	1	2	1	1	1	2	1
Introduce New Water Storage Practices	1	2	1	2			2	3		2
Track Flooding	1		2							
Rain Gardens	3	1	1	1			2			2
Retention Ponds	3	2	1							
Stormwater Ponds	3	1	1							
Grassed Waterway		1	1	2			2			2
Water and Sediment Control Basin (WASCOB)	2	1	1	2			2			2
Conservation Cover Perennials (convert working lands to perennial vegetation)		1	1	1	2	1	1			1
Lake Dredging		1						2		
Lake Alum Treatment		1						2		
Replace/Upgrade Failing or Non-Compliant Septic Systems		1					1			
Improve Priority Feedlots		1			2		1	2		
Manage Expanding Feedlots to Ensure Compliance		1					1			
Water Quality Monitoring		1	2					2		
Replace Street Sweeper Units			1							

1 = Primary Benefit 2 = Secondary Benefit 3 = Tertiary Benefit

Table 0-3: Implementation Actions and Issues Addressed

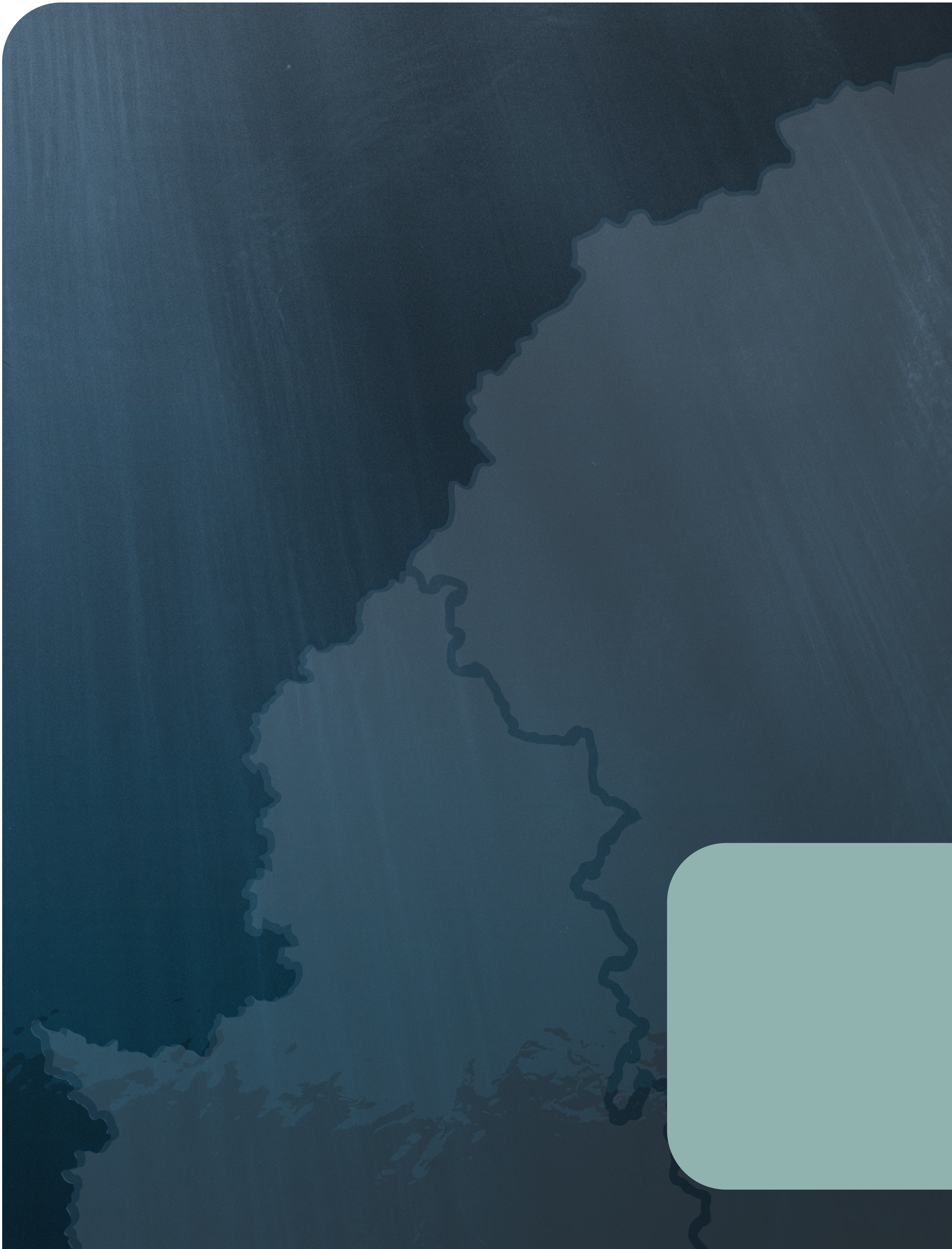
	Surface Water A1: Quantity	Surface Water A2: Quality	Surface Water B1: Erosion and Sediment Control	Natural Resources B2: Protect Soil Health	Natural Resources C1: Protect High Ecological Value	Natural Resources C2: Restore Wetland and Upland Habitat	Groundwater C3: Groundwater Quantity and Quality	Natural Resources D1: Improve Degraded Aquatic Habitat	Natural Resources D2: Invasive Species	Groundwater E1: Groundwater Protection
Outreach and Education			1	1	1		1	1	1	
Street Sweeping		2	1							
Restore/Stabilize Eroding and Failing Streambanks		1	1		2	2		1		
Restore/Stabilize Eroding and Failing Lakeshore		1	1		2	2		1		
Inventory Failing Streambanks		1	1			2		1		
Water Quality Treatment Pond	3	2	1							
Quantify Existing Level of Implementation of Soil Health Practices				1						
Expand Acres Implementing Soil Health Practices	1	1	1	1			2			1
Enhance Critical Habitat Areas	1	1	1	1	2	1	1	1	2	1
Upland and Wetland Habitat Enhancement	1	1	1	1	2	1	1	1	2	1
Upland and Wetland Habitat Restoration	1	1	1	1	2	1	1	1	2	1
Seal Wells							1			1
Track Nitrate Testing Results							1			1
Restore/Enhance Shoreline Habitat		2	2			1		1	3	

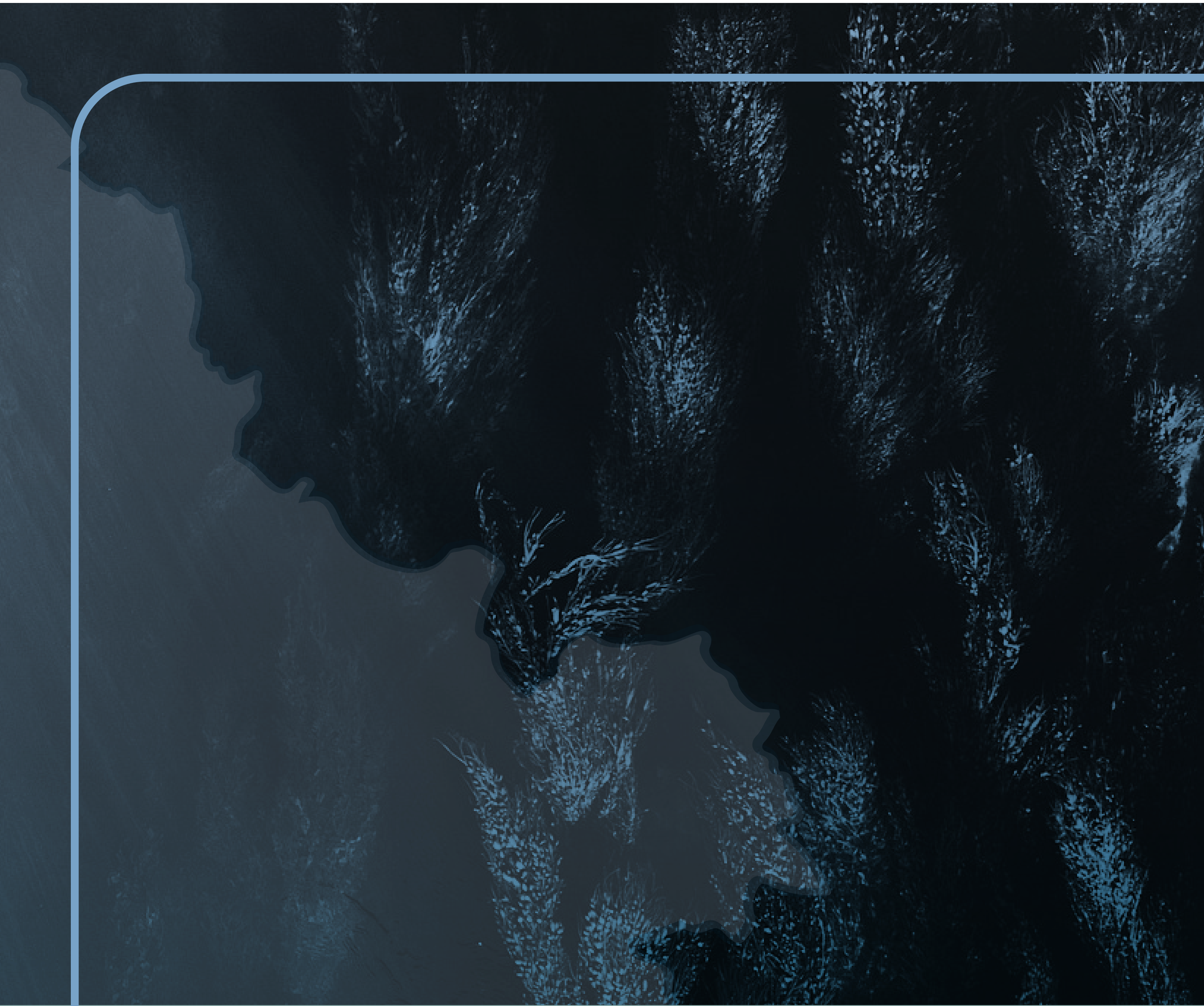
1 = Primary Benefit   2 = Secondary Benefit   3 = Tertiary Benefit

Table 0-3: Implementation Actions and Issues Addressed

	Surface Water A1: Quantity	Surface Water A2: Quality	Surface Water B1: Erosion and Sediment Control	Natural Resources B2: Protect Soil Health	Natural Resources C1: Protect High Ecological Value	Natural Resources C2: Restore Wetland and Upland Habitat	Groundwater C3: Groundwater Quantity and Quality	Natural Resources D1: Improve Degraded Aquatic Habitat	Natural Resources D2: Invasive Species	Groundwater E1: Groundwater Protection
In-Lake Habitat Improvements		2	2					1	3	
Track MIBI/FIBI Scores		3						1	1	
Lake Level Drawdown		2			2			1	1	
Restore Native Aquatic Vegetation		2						1	1	
Manage Carp Populations		1						1	1	
Fish Community Reclamation/Rotenone		1						1	1	
Electric Fish Barrier		1						2	1	
Develop Early Detection and Rapid Response Plan								2	1	
Watercraft Inspections								2	1	
Herbicide Macrophyte Management		2						1	1	
Support MDH in Establishing a Wellhead Protection Plan							2			1
Develop County Geologic Atlas							2			1

1 = Primary Benefit 2 = Secondary Benefit 3 = Tertiary Benefit

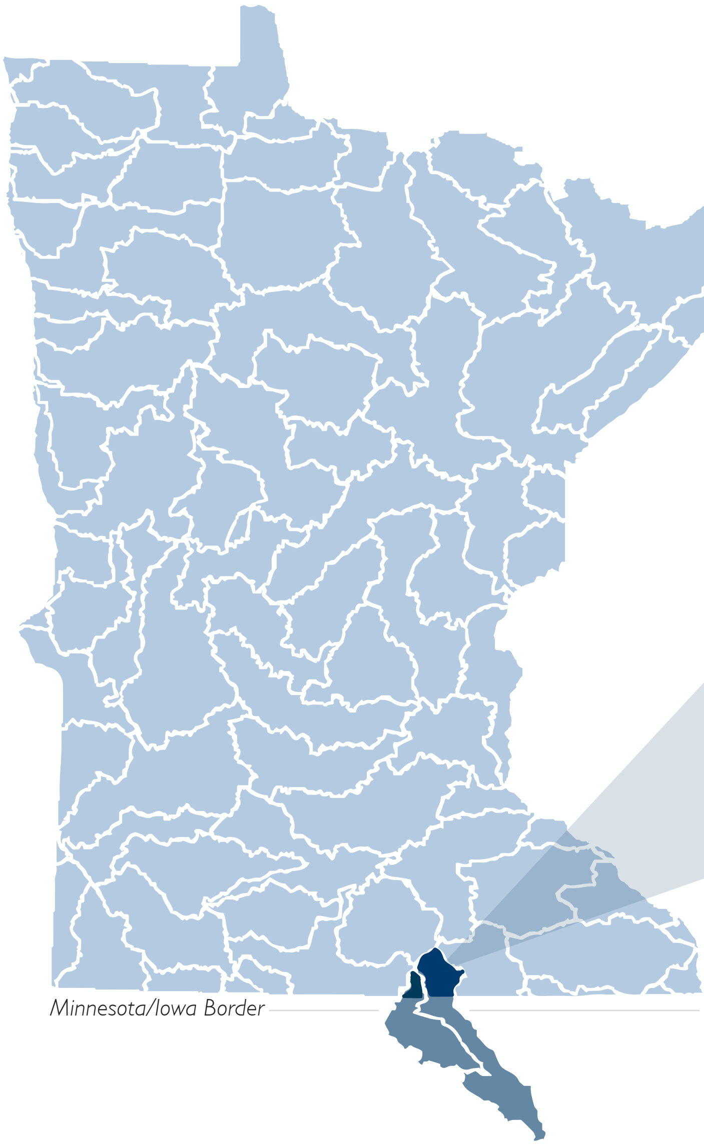




CHAPTER 1.0

LAND AND WATER RESOURCES SUMMARY

1.0 LAND AND WATER RESOURCES SUMMARY



23%
OF THE SHELL ROCK RIVER WATERSHED IS LOCATED IN MINNESOTA

10%
OF THE WINNEBAGO RIVER WATERSHED IS LOCATED IN MINNESOTA

The planning area is almost entirely within Freeborn County and is made up of two major watersheds, the Shell Rock River and Winnebago River watersheds (Figure 1-1). Both watersheds are located in south central Minnesota and extend into Iowa. The Shell Rock River and Winnebago River watersheds are a small portion of the entire watershed areas with only 23% and 10%, respectively of their total watershed areas located in Minnesota with the remainder located in Iowa. The Shell Rock River watershed in Minnesota is 246 square miles and entirely within Freeborn County, while the Winnebago watershed is 71 square miles in Minnesota and mostly in Freeborn County with a very small (< 1 square mile) portion in southeastern Faribault County. The watershed's largest city is Albert Lea, located at the intersection of Interstate 35 and 90. Other towns include Hayward, Glenville, Twin Lakes, Manchester, Emmons, Conger, and portions of Clarks Grove.

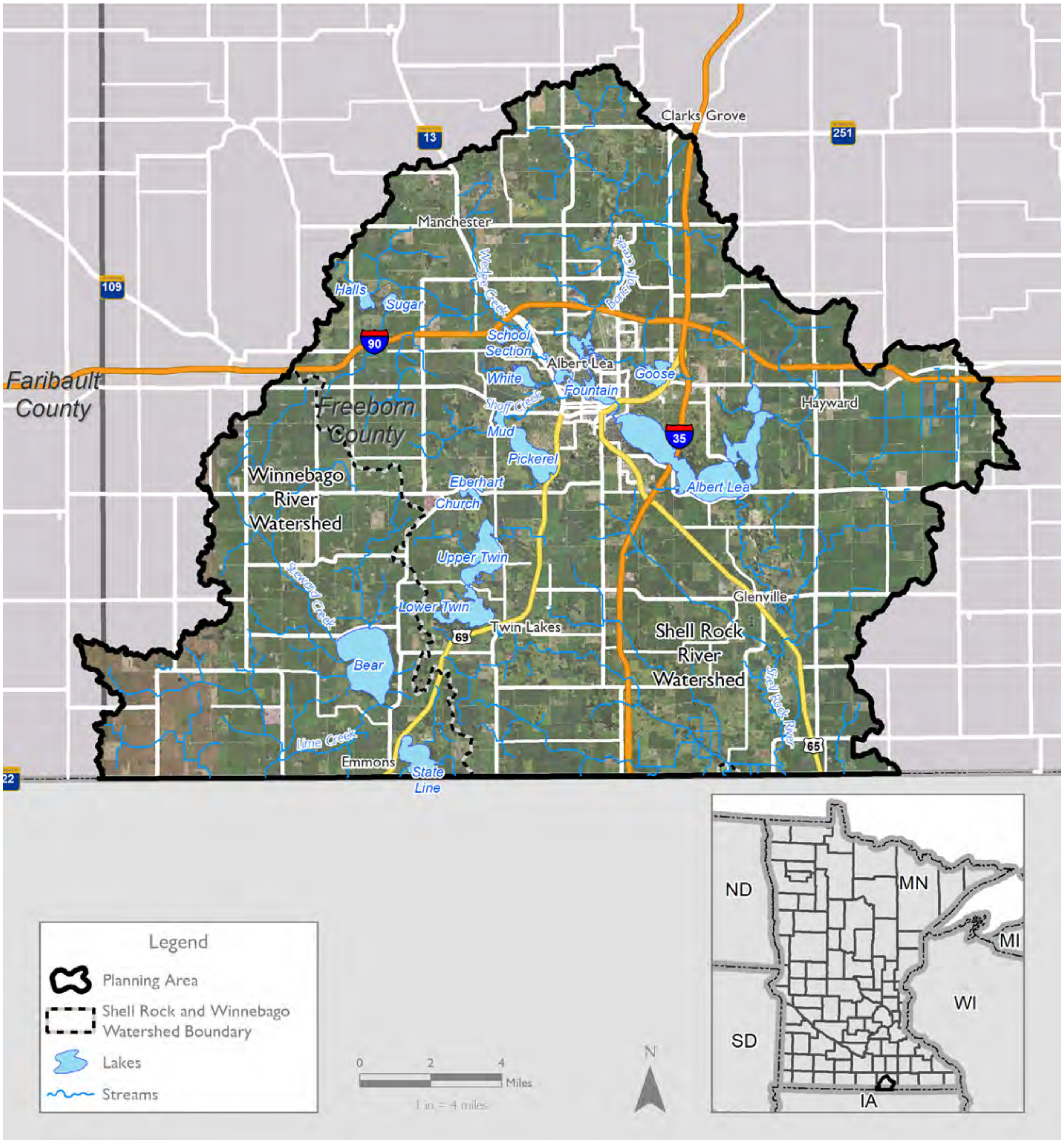


Figure 1-1: **Shell Rock River - Winnebago River Comprehensive Watershed Management Plan Planning Area**

1.1 LAND USE

Land use in the planning area is consistent with much of southern Minnesota with agriculture making up a majority (75%) of the area (Figure 1-2). Typical crops grown include corn, soybeans, small grain, and hay with some areas used for growing vegetables such as peas and sweet corn. Based on the United States Department of Agriculture (USDA) estimates for Freeborn County, there are likely around 500 farms in the planning area that average 366 acres in size.

There are 151 active feedlots in the Shell Rock River and Winnebago River watersheds (Figure 1-3). Approximately 80% of the feedlots have less than 300 animal units, and there are 10 confined animal feeding operations (CAFO). While the total number of feedlots is decreasing over time, the size of those that remain is growing. This correlates with a larger trend in agriculture where smaller family farms are being replaced by larger operations.

Remnant woodlands, shrublands, and grasslands occur primarily in riparian corridors through conservation lands but can also be seen distributed throughout the watersheds. Overall, there is a small percentage of impervious surfaces in the planning area which is driven by the rural landscape. The City of Albert Lea is the largest urban area and is the only municipal separate storm sewer system (MS4) entity that exists in the planning area (Figure 1-4). As a MS4, the City must satisfy the requirements of the MS4 general permit to manage pollutants associated with stormwater runoff.

Land use in the planning area is not expected to change in the future with much of the landscape in agriculture and population changes remaining relatively consistent. The Freeborn County population estimate for 2019 is 30,281, down 3.1% from 2010, and Albert Lea's population estimate for 2019 is 17,656, down 3.0% from 2010 [United States Census Bureau, 2019].

75%
AGRICULTURAL LAND

500 FARMS
IN THE PLANNING AREA

151
ACTIVE FEEDLOTS

MS4 URBAN AREA
CITY OF ALBERT LEA

17,656
2019 ESTIMATED ALBERT LEA POPULATION

30,281
2019 ESTIMATED COUNTY POPULATION

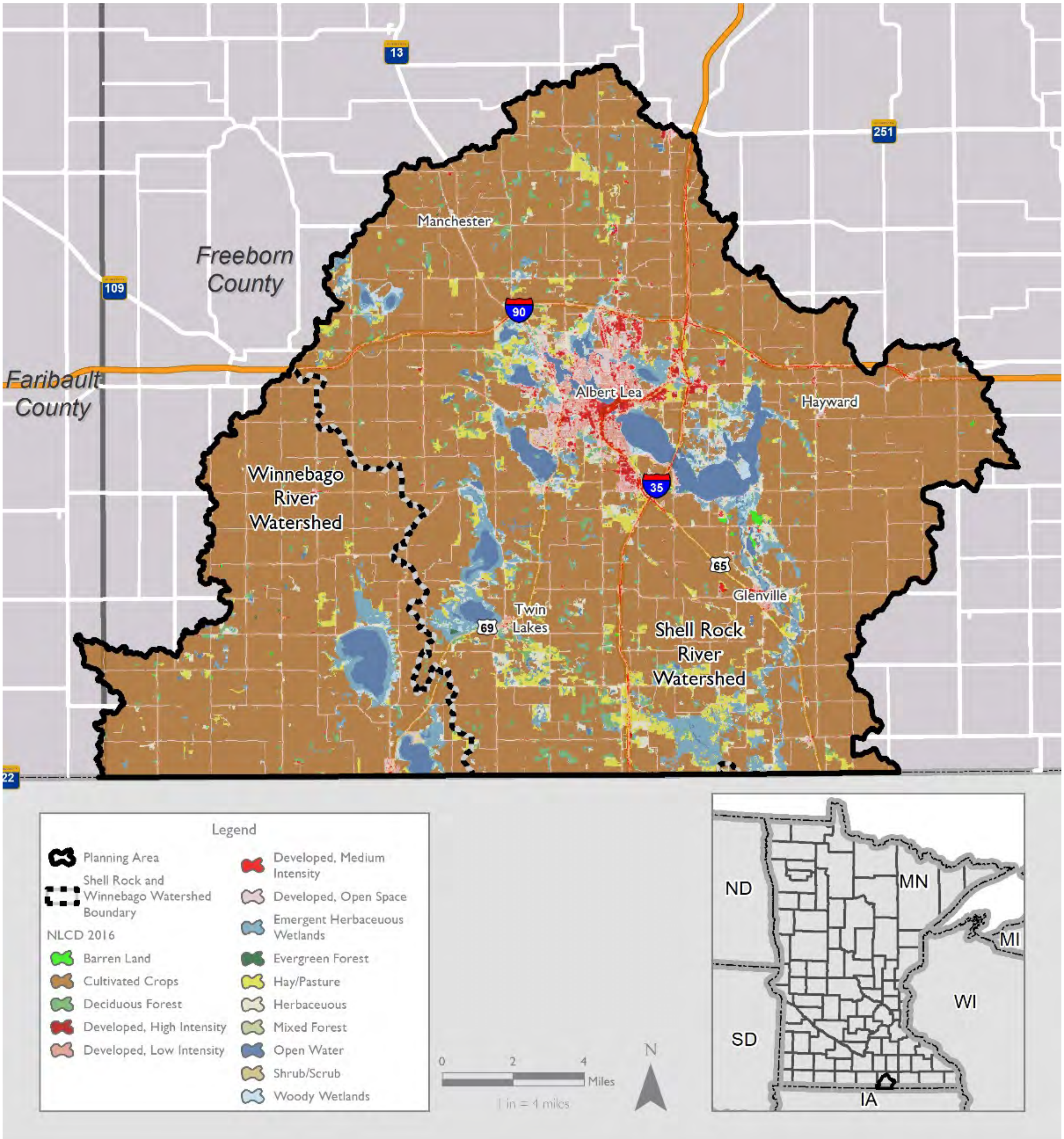


Figure 1-2: Land Cover in the Planning Area

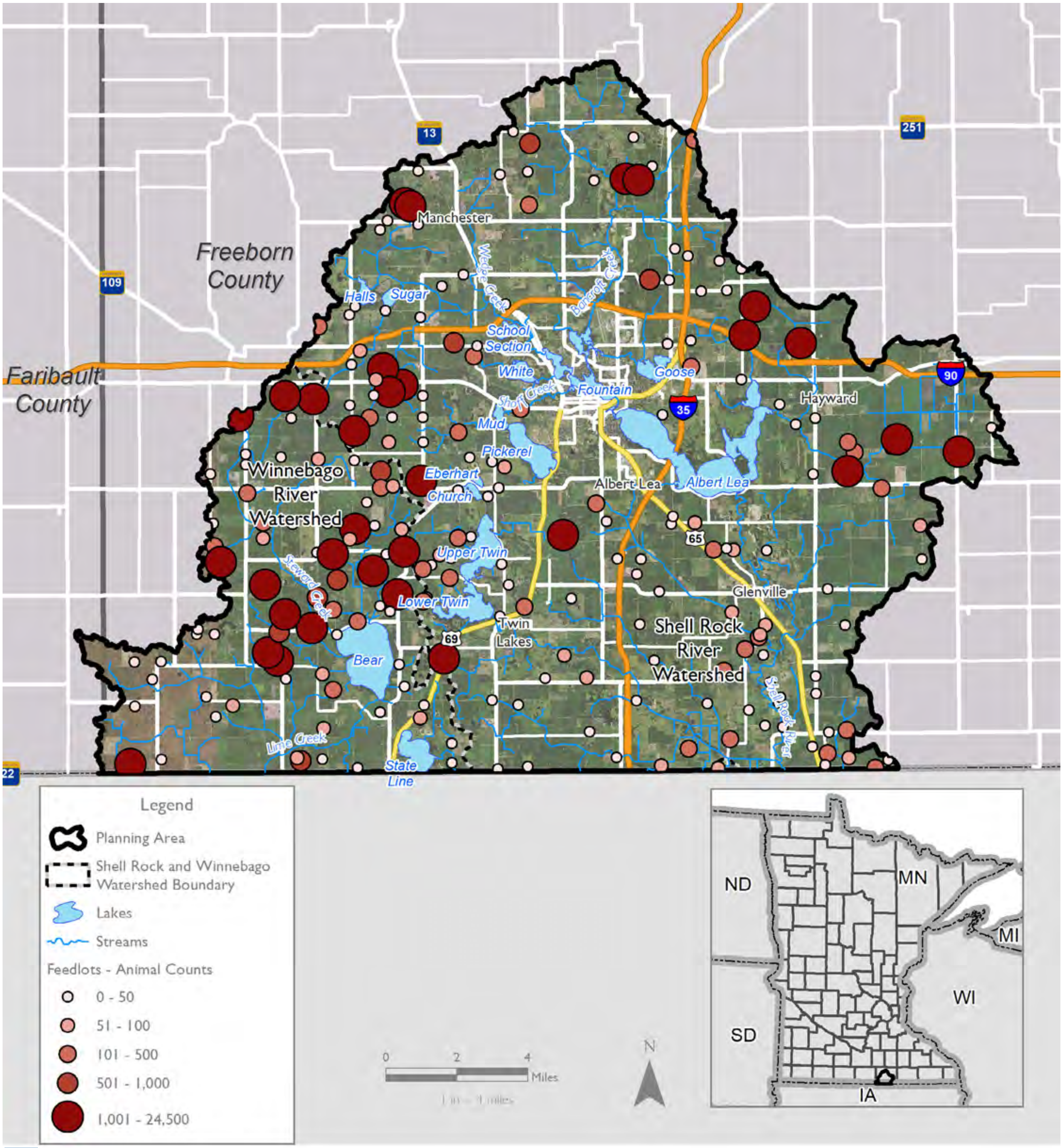


Figure 1-3: Active Feedlots in the Planning Area

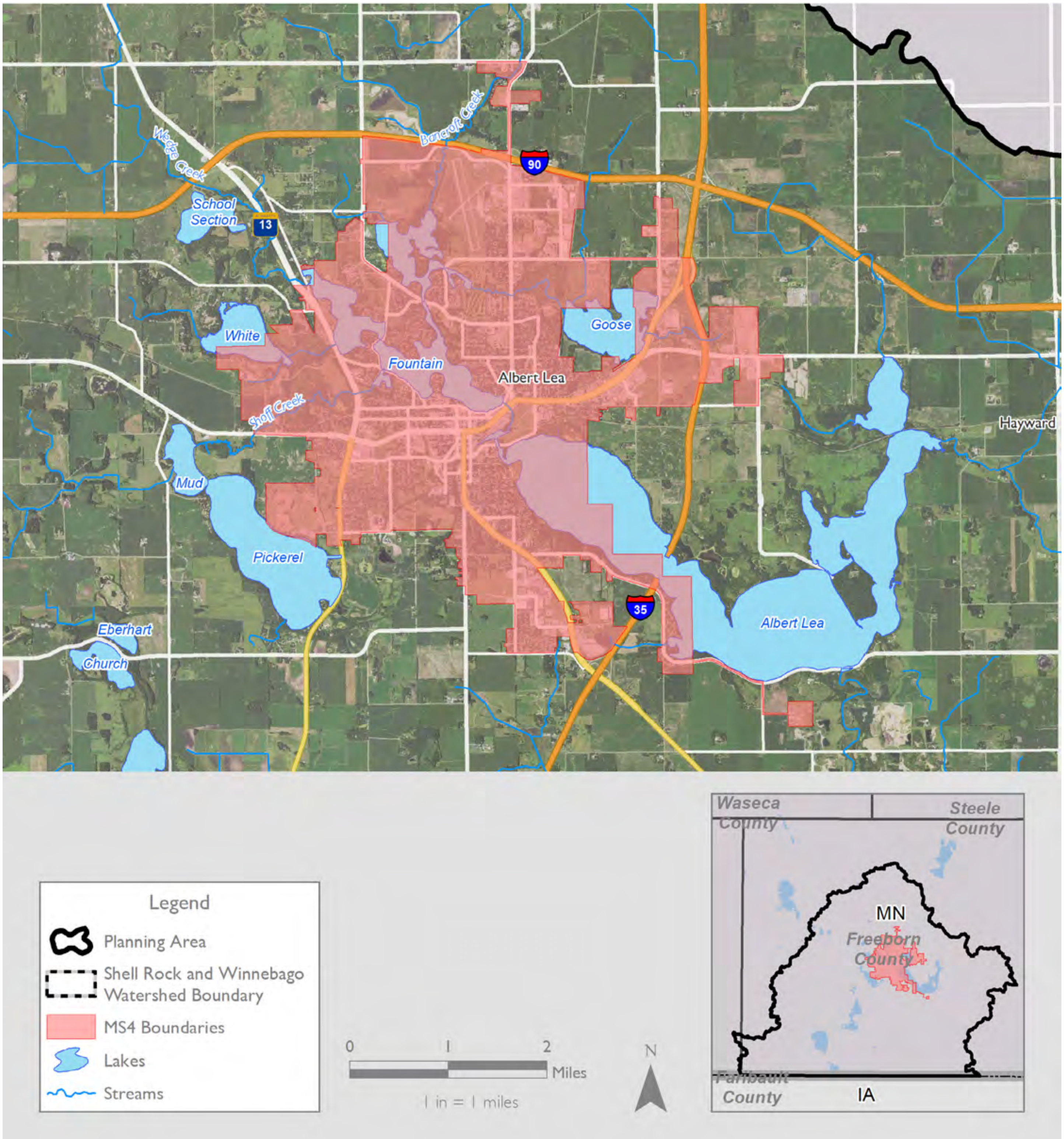


Figure 1-4: City of Albert Lea MS4 Boundary

1.2 SURFACE WATER

The planning area has an extensive drainage ditch network that was developed over 100 years ago to make the landscape suitable for agriculture. While drainage defines much of the stream networks, the area is also home to popular lakes that provide recreational opportunities and waterfowl habitat. These lakes are highlighted by Fountain Lake, Albert Lea Lake, and Pickerel Lake. Fountain Lake is in the heart of Albert Lea with waterfront views from downtown, multiple public water accesses, and multiple public parks along the shoreline. Fountain Lake serves as the start of a MNDNR Water Trail which continues downstream into Albert Lea Lake, then on to Shell Rock River and provides canoing and kayaking opportunities to the area. Albert Lea Lake is a large shallow lake that provides important waterfowl habitat to the area and surrounds Myre-Big Island State Park. Pickerel Lake provides fishing opportunities and important waterfowl habitat to the area with a healthy population of diver ducks and native fish. Other lakes in the planning area include Mud, White, Goose, School Section, Halls, Sugar, Bear, State Line, and Upper and Lower Twin Lake, many of which are shallow lakes that provide waterfowl habitat.

Wetlands account for approximately 7% of the total planning area based on the National Wetland Inventory (NWI). Nearly 90% of these wetlands are classified as emergent wetlands. The remainder are forested and shrub wetlands. Location of wetlands as well as the public drainage system are shown in Figure 1-7.

Water Quantity

There is one streamflow gaging station located in the planning area which is maintained by the United States Geologic Survey (USGS). The gaging station is located on the Shell Rock River in Gordonsville, Minnesota, just north of the Iowa border. This streamflow gaging station can be used to assess surface water quantity for the Shell Rock River Watershed over time. River flooding is not currently a concern in the planning area, but localized flooding in urban areas, particularly the City of Albert Lea, following large rain events has been documented and is identified as a priority concern in this plan.

Water Quality

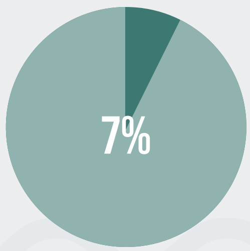
The Minnesota Pollution Control Agency (MPCA) conducts water quality assessments as a part of an intensive watershed monitoring program to determine the condition of surface waters in the state. The assessments show that surface waters in the planning area face stressors common to the region with elevated nutrients, fish bioassessment, and macroinvertebrate bioassessment resulting in most of the impairments. In total, there are 12 streams and six lakes that are listed as impaired, totaling 43 unique impairments. These impairments area summarized in Table 1-1 and shown in Figures 1-5 and 1-6. A focus of this Plan is to implement a variety of practices that will improve water quality throughout the planning area.

KEY RECREATIONAL LAKES

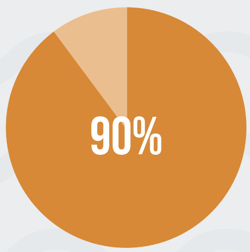
- Fountain Lake
- Albert Lea Lake
- Pickerel Lake

SHALLOW WATERFOWL LAKES

- Mud
- White
- Goose
- School Section
- Halls
- Sugar
- Bear
- State Line
- Upper and Lower Twin



WETLANDS



WETLANDS CLASSIFIED AS EMERGENT

Table 1-1: Impaired streams and lakes in the planning area based on 2022 draft list (does not include mercury)

WATER BODY NAME	MAJOR WATERSHED NAME	AFFECTED USE	POLLUTANT OR STRESSOR
Streams			
Bancroft Creek (County Ditch 63)	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments
		Aquatic Recreation	Escherichia Coli (E. coli)
County Ditch 16	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments
County Ditch 65	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments
County Ditch 66	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments
County Ditch 9	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments
Judicial Ditch 25	Winnebago River	Aquatic Life	Dissolved Oxygen, Fish Bioassessments
Lime Creek	Winnebago River	Aquatic Life	Dissolved Oxygen, Fish Bioassessments, Nutrients
		Aquatic Recreation	Escherichia Coli (E. coli)
Shell Rock River	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Dissolved oxygen, Fish Bioassessments, Nutrients, Turbidity
		Aquatic Recreation	Fecal Coliform
Steward Creek (County Ditch 23)	Winnebago River	Aquatic Life	Benthic Macroinvertebrates Bioassessments
			Dissolved Oxygen
County Ditch J26	Winnebago River	Aquatic Life	Dissolved Oxygen
Shoff Creek	Shell Rock River	Aquatic Life	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments, Nutrients, Turbidity
Wedge Creek	Shell Rock River	Aquatic Life	Fish Bioassessments
		Aquatic Recreation	Escherichia Coli (E. coli)
Lakes			
Albert Lea Lake	Shell Rock River	Aquatic Recreation	Nutrients
Bear Lake	Winnebago River	Aquatic Recreation	Nutrients
Fountain Lake (East Bay)	Shell Rock River	Aquatic Recreation	Nutrients, Fish Bioassessments
Fountain Lake (West Bay)	Shell Rock River	Aquatic Recreation	Nutrients, Fish Bioassessments
Fountain Lake (North Bay)	Shell Rock River	Aquatic Recreation	Nutrients, Fish Bioassessments
Pickerel	Shell Rock River	Aquatic Recreation	Nutrients
State Line Lake	Winnebago River	Aquatic Recreation	Nutrients
White Lake	Shell Rock River	Aquatic Recreation	Nutrients

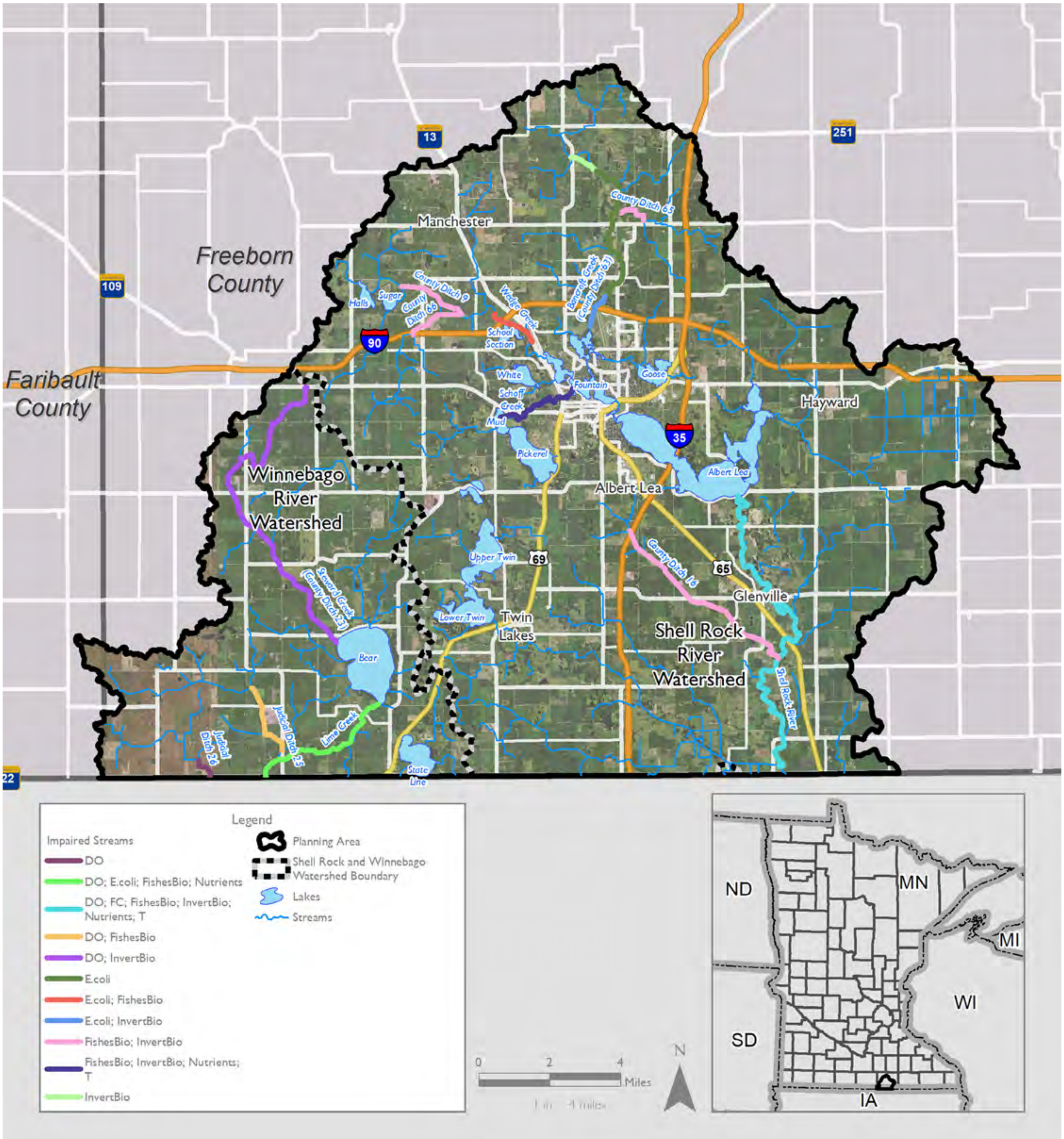


Figure 1-5: Impaired Streams in the Planning Area

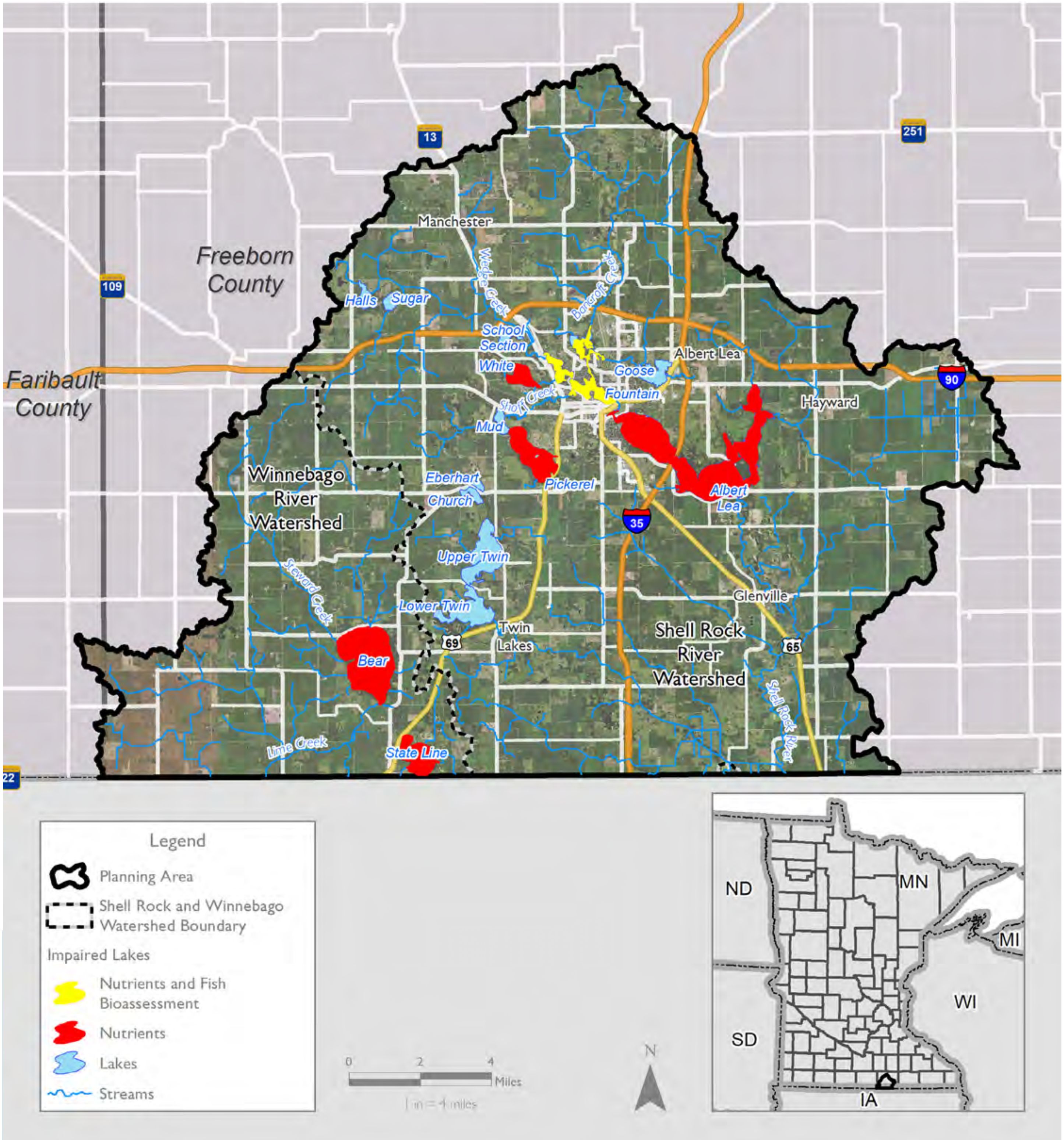


Figure 1-6: Impaired Lakes in the Planning Area

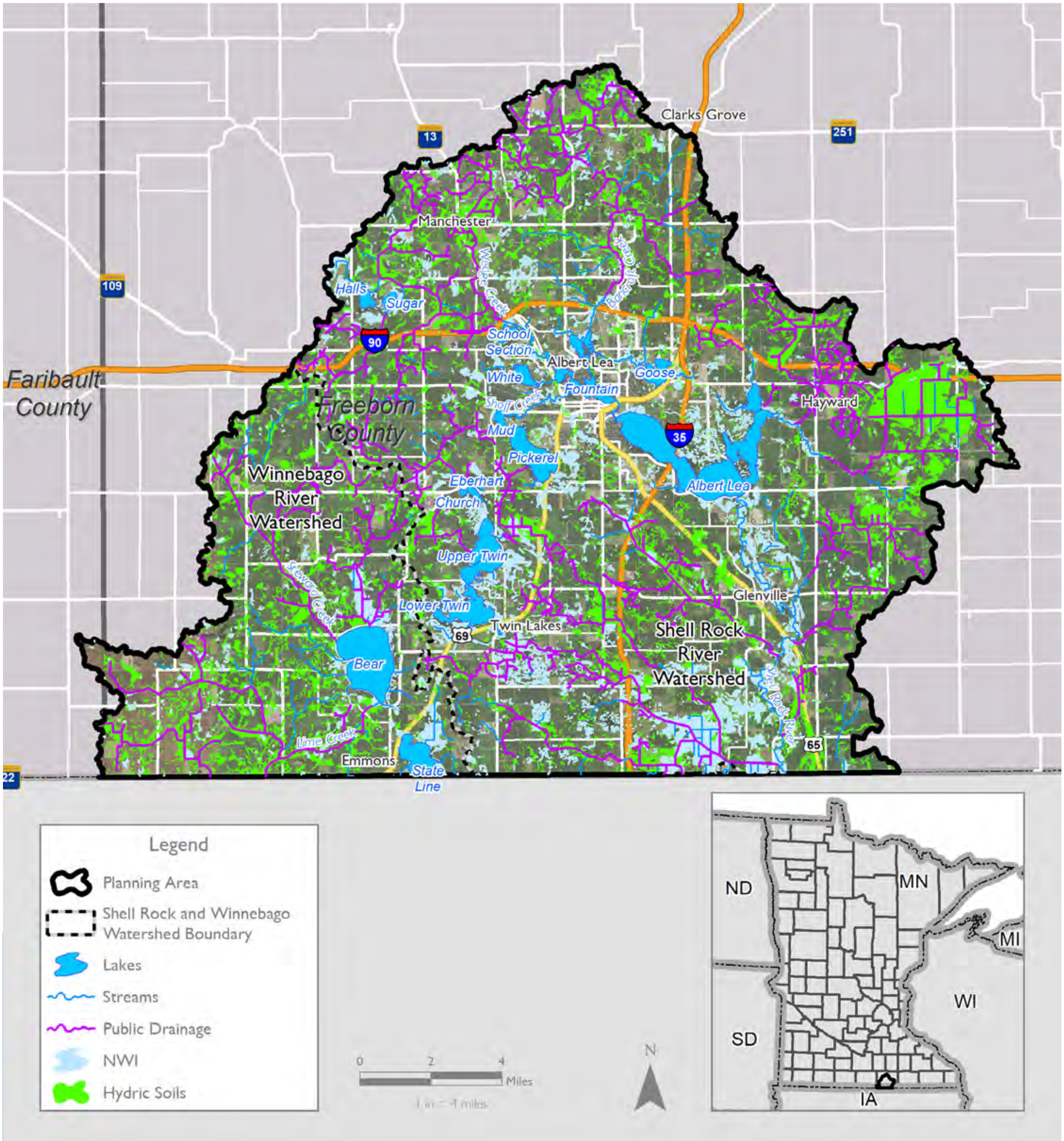


Figure 1-7: Public Drainage, Wetlands, and Hydric Soils in the Planning Area

PRIMARY AQUIFER

Fractured limestone and dolostone bedrock overlain by glacial sediment

1.3 GROUNDWATER

Groundwater is a vital resource in the planning area and accounts for 100 percent of the region's drinking water supply. The groundwater supply comes largely from a carbonate aquifer that occurs in fractured limestone and dolostone bedrock that is overlain by glacial sediment. Areas with karst geology have a greater risk to contamination from land-use activities such as agriculture, stormwater, septic systems, and tanks/landfills. While the planning area has karst geology there are layers of dense glacial till over the bedrock that provide protection for much of the planning area. However, there are areas with courser-grained glacial outwash at the surface that increase the pollution sensitivity of the underlying bedrock as shown in Figure 1-8 [MDH, 2020].

Monitoring is conducted throughout the planning area to detect contamination of the drinking water supply from both natural sources and human activity. Currently none of the tested drinking water wells had levels of nitrate above the Safe Water Drinking Act (SWDA) standard of 10 mg/L but results from the MDA ambient monitoring well recorded a maximum result of 60.6 mg/L of nitrate in 2018 highlighting the importance of continued monitoring and tracking of nitrates. Arsenic exceeded the SWDA standard of 10 ug/L in 30% of the 100 tested wells. Therefore, it is important to increase awareness of arsenic and its risks in drinking water to residents in the planning area. Additional threats to the drinking water supply include pesticides with five common pesticides detected in the MDA monitoring well and contamination resulting from leaky underground tanks and landfills.

Nitrate contamination is a growing concern around the state and is directly tied to land-use practices. The Minnesota's Nitrogen Fertilizer Management Plan is the states blueprint for preventing and minimizing the impacts of nitrogen fertilizer on groundwater. As an element of this plan, a newly adopted Groundwater Protection Rule (GPR) has been approved that restricts the use of nitrogen fertilizers in the fall (after September 1) or on frozen soils in identified vulnerable groundwater areas (Figure 1-9). More information regarding the GPR can be found at https://www.mda.state.mn.us/part-1-groundwater-protection-rule.

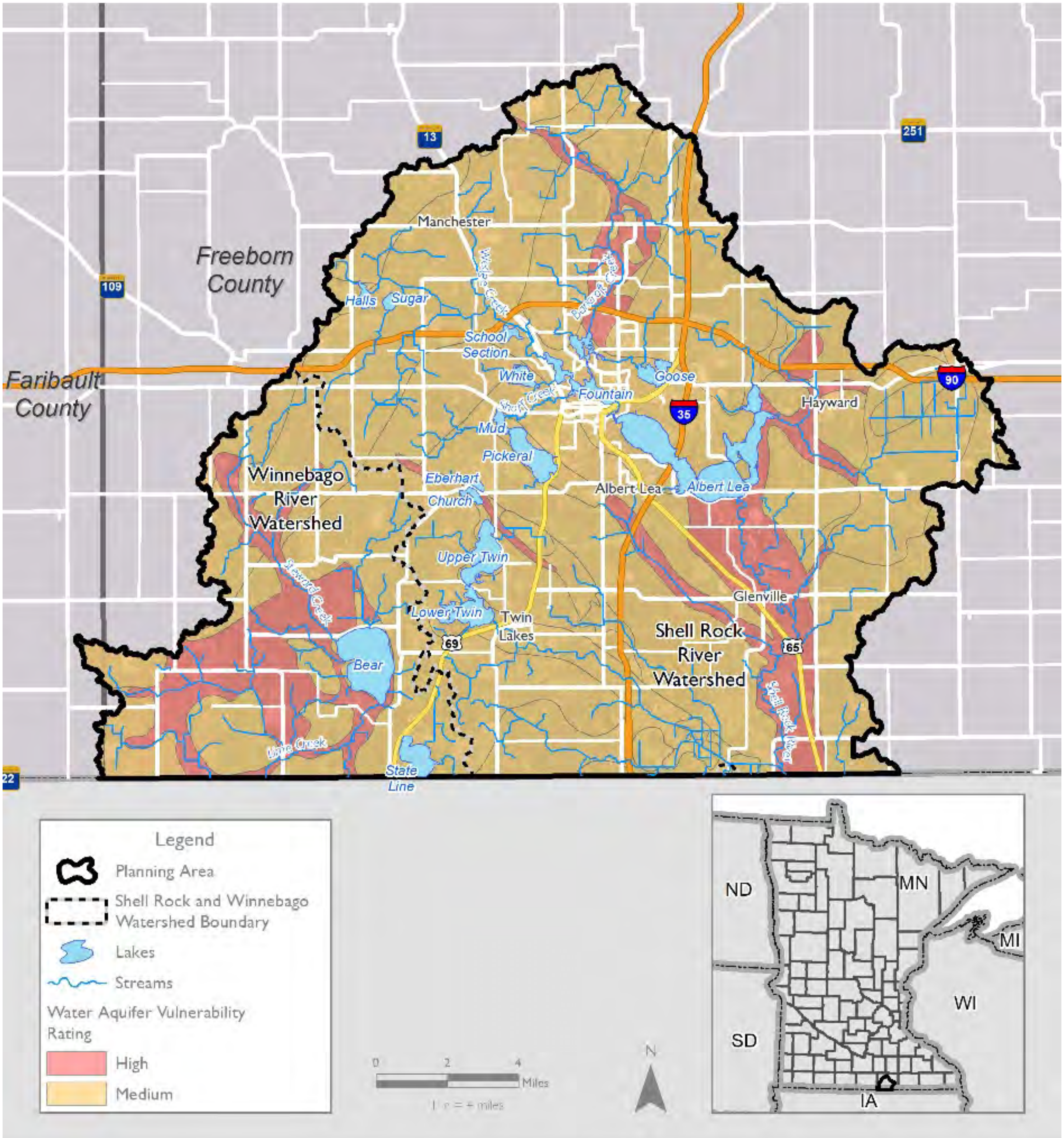


Figure 1-8: Aquifer Vulnerability in the Planning Area

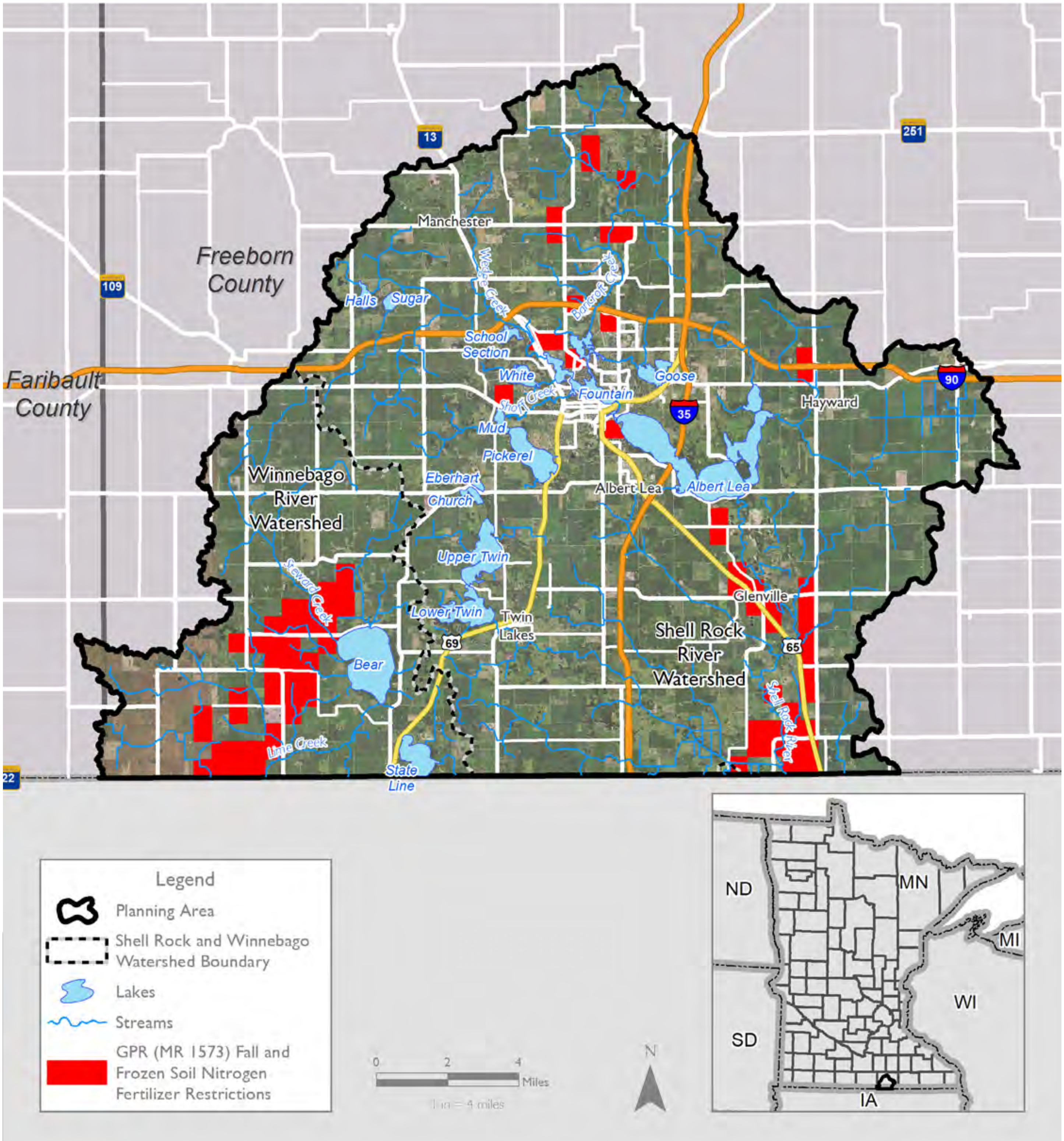


Figure 1-9: Quarter Sections Subject to the MN Groundwater Protection Rule (MR 1573) for Nitrogen Fertilizer Restrictions in the Fall and on Frozen Soils in the Planning Area

1.4 TOPOGRAPHY

The relief of the Shell Rock River and Winnebago River watersheds is the product of continental glaciers receding following the last ice age. As the glaciers receded, they deposited significant amounts of glacial sediments over the underlying rock. This deposited sediment was deep enough that the rock strata below had little impact on surface relief. The County's lakes formed where large ice blocks broke free from the glacier, while the many wetlands formed in the small depressions left after the glacier's retreat. As a result, the planning area's topography ranges from nearly level to rolling hills present where glaciers deposited end moraines. The two moraine belts, Altamont/ Algona Moraine and the Bemis Moraine, cross the area from southwest to northeast (Figure 1-10).

2
MORAINE BELTS

Altamont/Algona Moraine

Bemis Moraine

1.5 SOILS

The soils of Freeborn County are moderately deep and loamy in texture. They formed most extensively in glacial till and less extensively in glacial outwash, lacustrine sediments, alluvium, and organic material. The different parent materials, climate, topography, and native vegetation account for the various soil types encountered across the planning area.

SOILS

Moderately Deep

Loamy

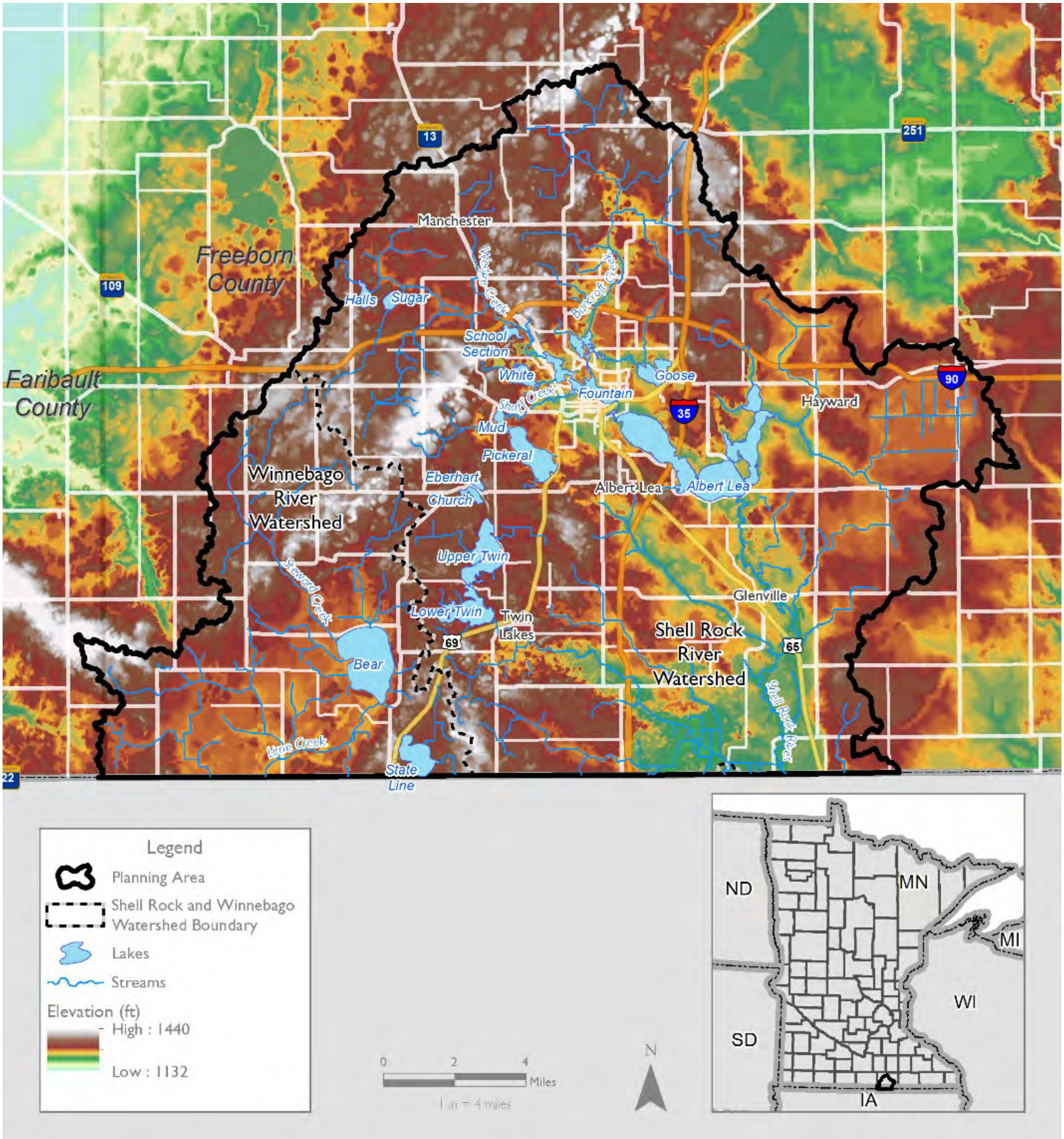


Figure 1-10: Surface Elevation in the Planning Area

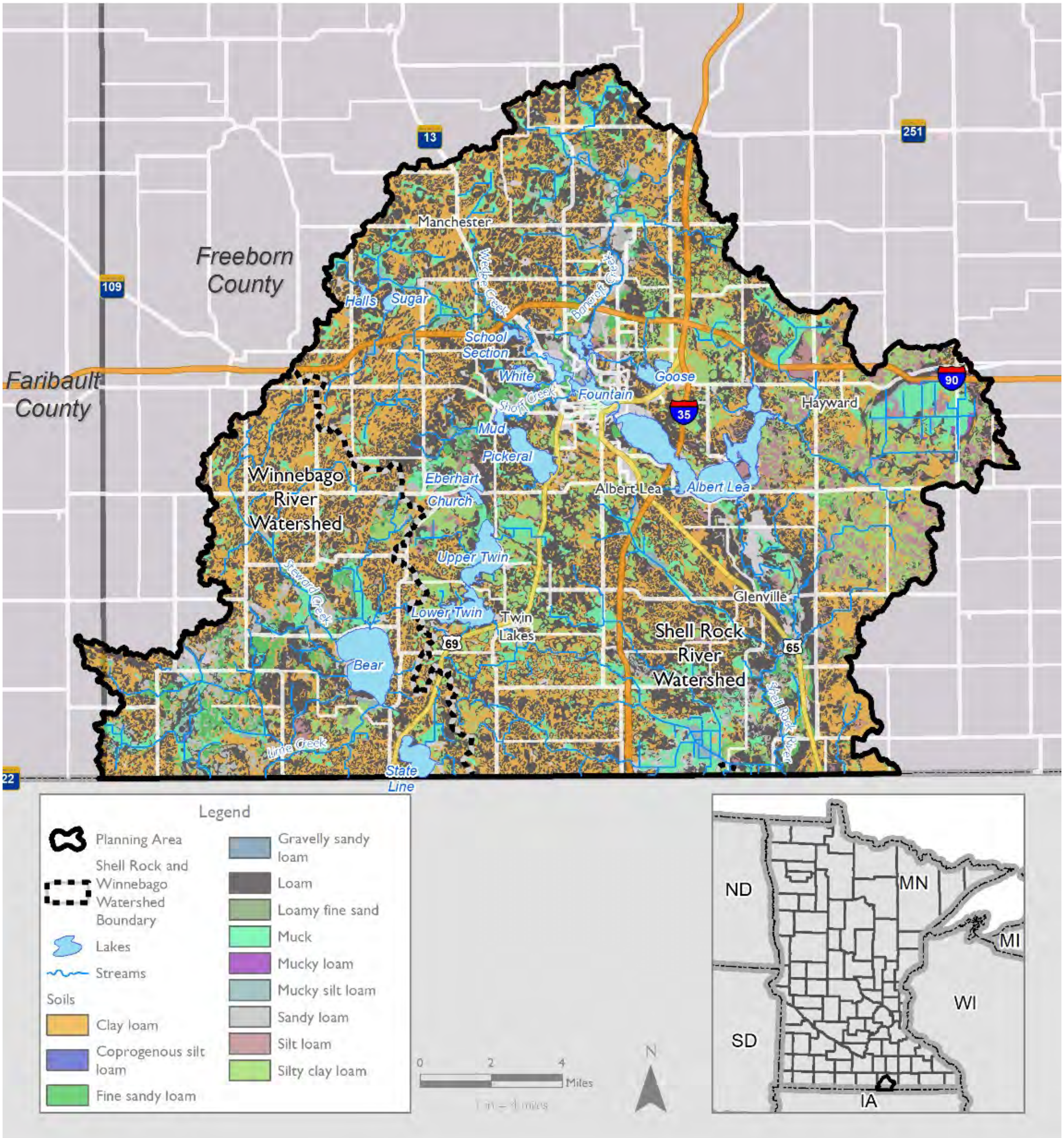


Figure 1-11: Soil Type in the Planning Area

1
OFFICIAL
WEATHER STATION

PRECIPITATION

Increasing rainfall averages

Rainier late springs

Early summers

Heavier rainfall events occurring more frequently

1.6 CLIMATE

There is one official observation station within the planning area located at the Albert Lea Wastewater Treatment Plant. Weather observations include daily maximum and minimum temperatures, daily rainfall, and snowfall.

Long-term precipitation records show an annual rainfall average of roughly 32 inches in the northern and western portions of the planning area, and up to 34 inches in the southwestern portion of the planning area (Figure 1-12). In the 1971 to 2000 statistical period, annual rainfall in the planning area averaged between 32 and 33 inches. In the 1981 to 2010 statistical period, this average increased to a range of 34 to 35 inches. This increase in precipitation is due to recent trends that include rainier later springs and early summers. In addition to an increasing trend in annual precipitation, precipitation events have become more intense with larger rainfall events occurring more frequently [BWSR, 2019]. These changes in precipitation trends are expected to continue and have a direct impact on water resources. Stressors already present such as excess erosion and water quality issues will only be exacerbated as a result of these changing conditions. While precipitation trends overall show increasing amounts of rain, the precipitation patterns are less consistent. This can result in periods of significant drought. Actions identified in this plan, such as increasing water storage, are important steps to building resiliency to these changes and it is imperative that future management actions adapt to these changes. Efforts are already underway which is highlighted by the city of Albert Lea's Climate Action Plan. https://www.cityofalbertlea.org/wp-content/uploads/Albert-Lea-Climate-Action-Plan-web.pdf

Temperature across the planning area is generally uniform with variations in relief, vegetation, and soils, resulting in slight differences from one area to another. The average annual temperature from 1989 to 2018 for the area is 44.9° Fahrenheit (F) with winter temps (December through February) averaging 18.1° F and summer temps (June through August) averaging 69.0° F. Average annual temperatures have increased 0.8° F, with average winter temperatures showing the largest increase (1.9° F) and average summer temperatures slightly decreasing (-0.1° F) [MNDNR, 2019].

TEMPERATURE

44.9° F
AVERAGE ANNUAL TEMP
(1989 - 2018)

0.8° F
INCREASE IN AVERAGE ANNUAL TEMPERATURES

18.1° F
AVERAGE WINTER TEMP
(1989 - 2018)

1.9° F
AVERAGE WINTER TEMPERATURE INCREASE

69.0° F
AVERAGE SUMMER TEMP
(1989 - 2018)

-0.1° F
AVERAGE SUMMER TEMPERATURE DECREASE

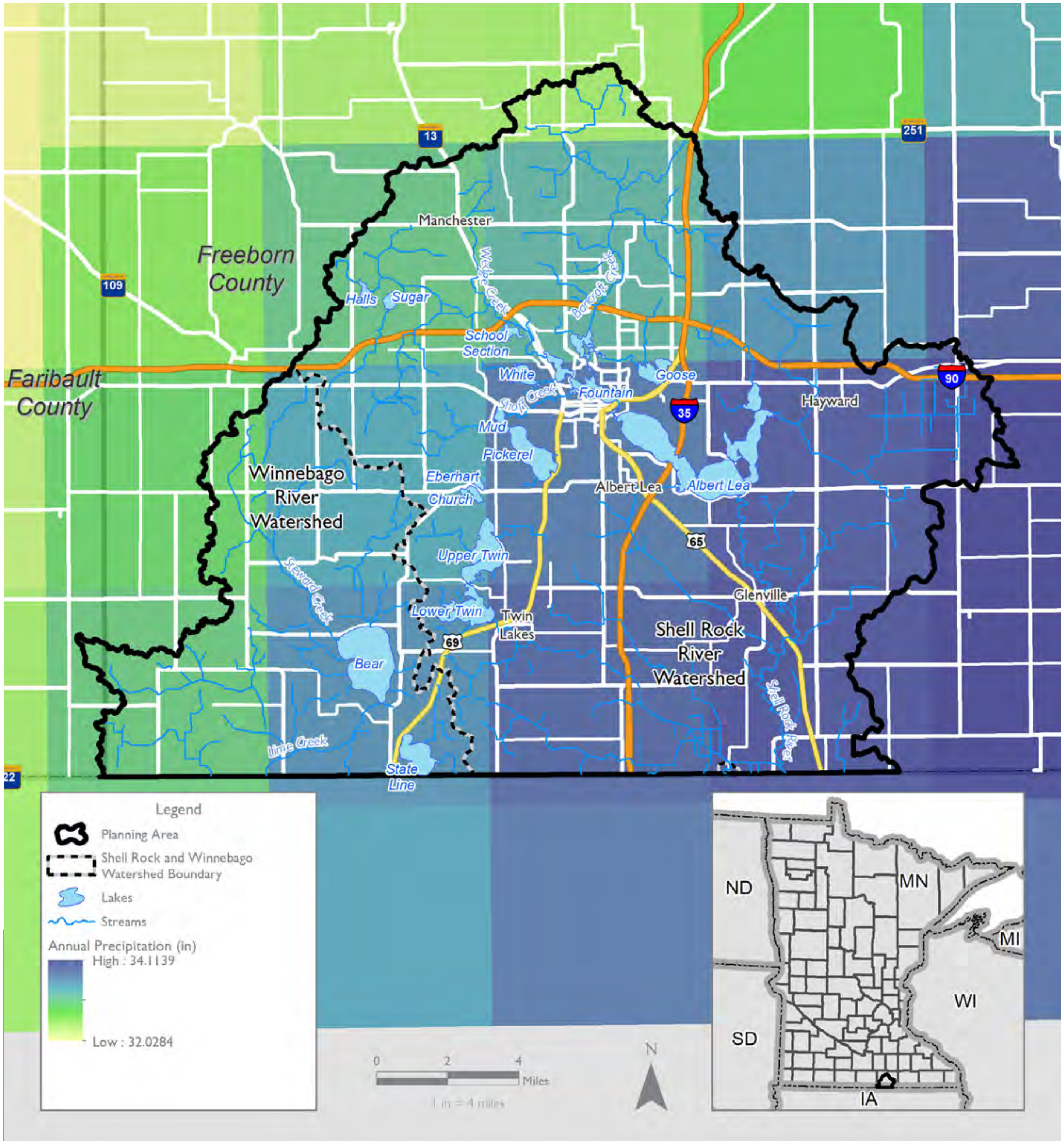


Figure 1-12: **Annual Precipitation in the Planning Area**

VEGETATION

- Oak Woodland
- Brushland
- Prairie Wetland
- Upland Prairie

1.7 PRESETTLEMENT VEGETATION

The landscape seen today is greatly changed from the landscape that was present prior to European settlement. When settlers arrived to this area, they developed an extensive ditch network that was used to drain the landscape and established highly productive agricultural land. Understanding the original landscape and vegetation can be used to identify areas with the most suitable restoration potential. Specifically, low lying areas with moist soils are targeted for wetland restorations and incorporated into the tools referenced in this plan.

The majority of presettlement vegetation in the planning area was oak woodland and brushland followed by prairie wetland and upland prairie (Figure 1-13). The oak woodland and brushland was a common landscape found between the open prairies and deciduous forests. This landscape ranged from small groves of trees intermixed with open prairie to a community of scrub forest and dense shrub thickets. Bur oak and northern pin oak were the dominant oak species. The upland prairie and prairie wetland landscape included vegetation such as prairie cordgrass and blue joint in the wet lowlands, big bluestem and Indiangrass occupied the fertile soils of the moist uplands, and little bluestem and sideoats grama occurred on the thin soils of the dry uplands.

BUR OAK

NORTHERN PIN OAK

PRAIRIE CORDGRASS

BIG BLUESTEM

LITTLE BLUESTEM

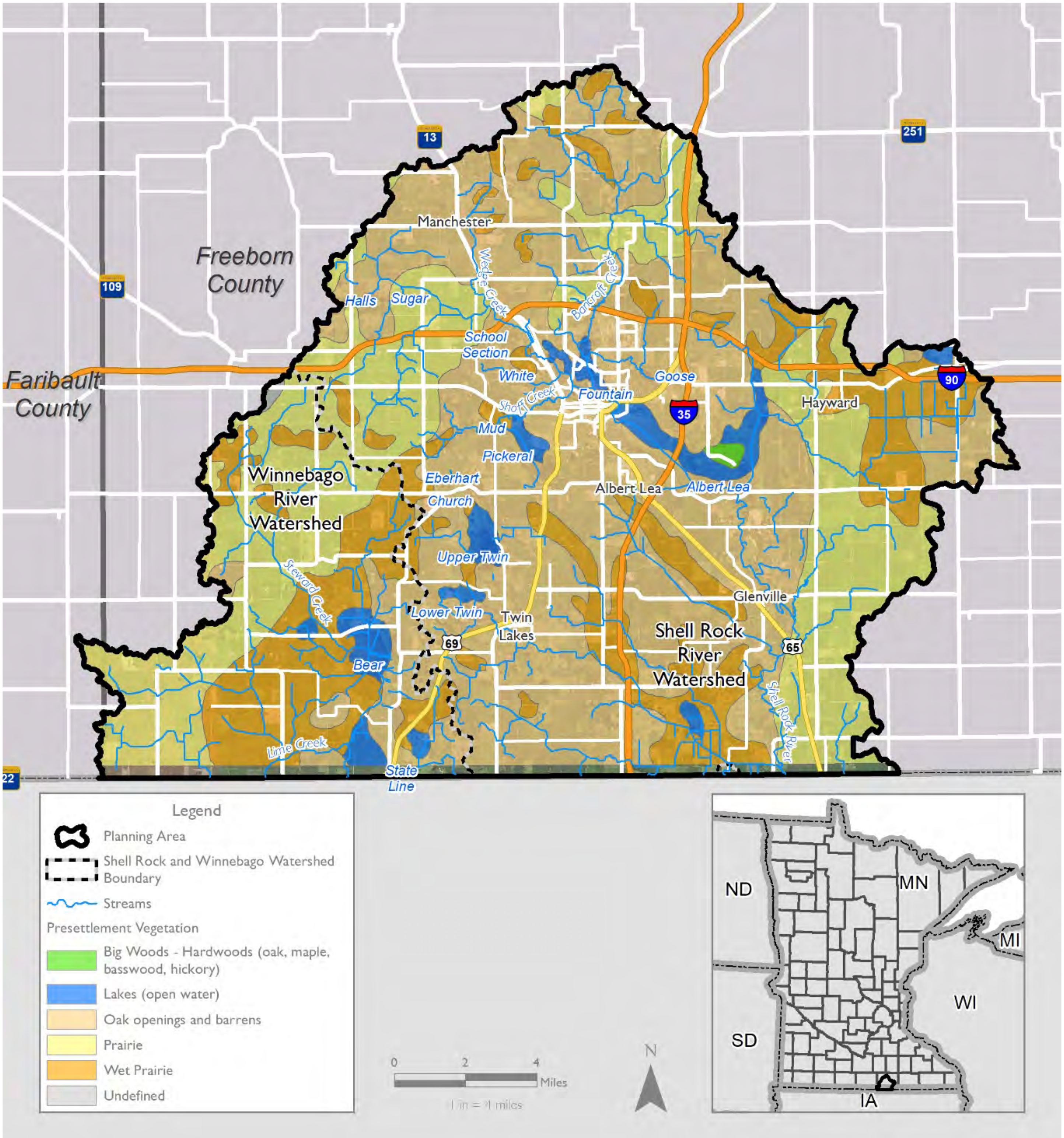


Figure 1-13: Presettlement Vegetation in the Planning Area

HABITATS AND WILDLIFE

Minnesota Statute §§ 88.0895

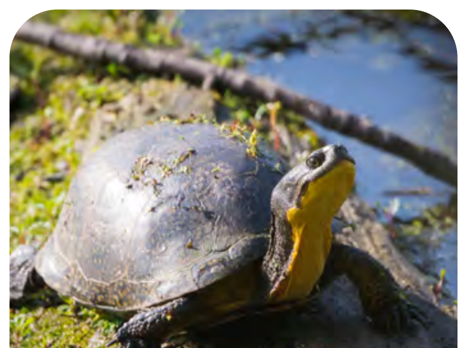
State Status

Federal Status

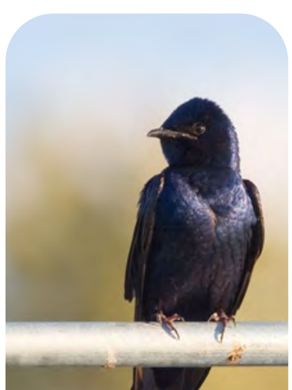
1.8 HABITAT AND RARE AND ENDANGERED SPECIES

Minnesota Statute §§ 88.0895 governs protection of threatened and endangered species and defines species with special protection as follows: endangered species are those threatened with extinction throughout all or a significant portion of its range; threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of its range; and species of special concern are those that are not endangered or threatened, but are extremely uncommon in Minnesota or have unique or highly specific habitat requirements and deserve careful monitoring. MNDNR is required to adopt rules designating species as endangered, threatened, or species of special concern. Species are also protected at the federal level and their protection status is determined by the U.S. Fish and Wildlife Service (USFWS). Species with protection status at the state (as listed by MNDNR) and federal level (as listed by USFWS) present in Freeborn County are shown in Table 1-2.

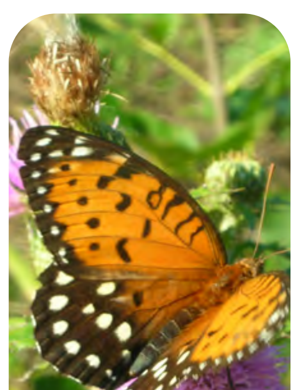
LOGGERHEAD SHRIKE



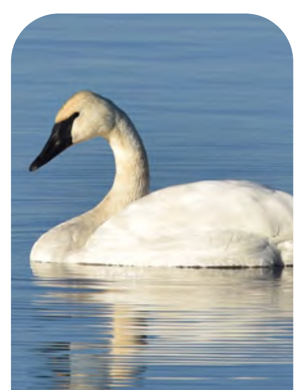
BLANDING'S TURTLE



PURPLE MARTIN



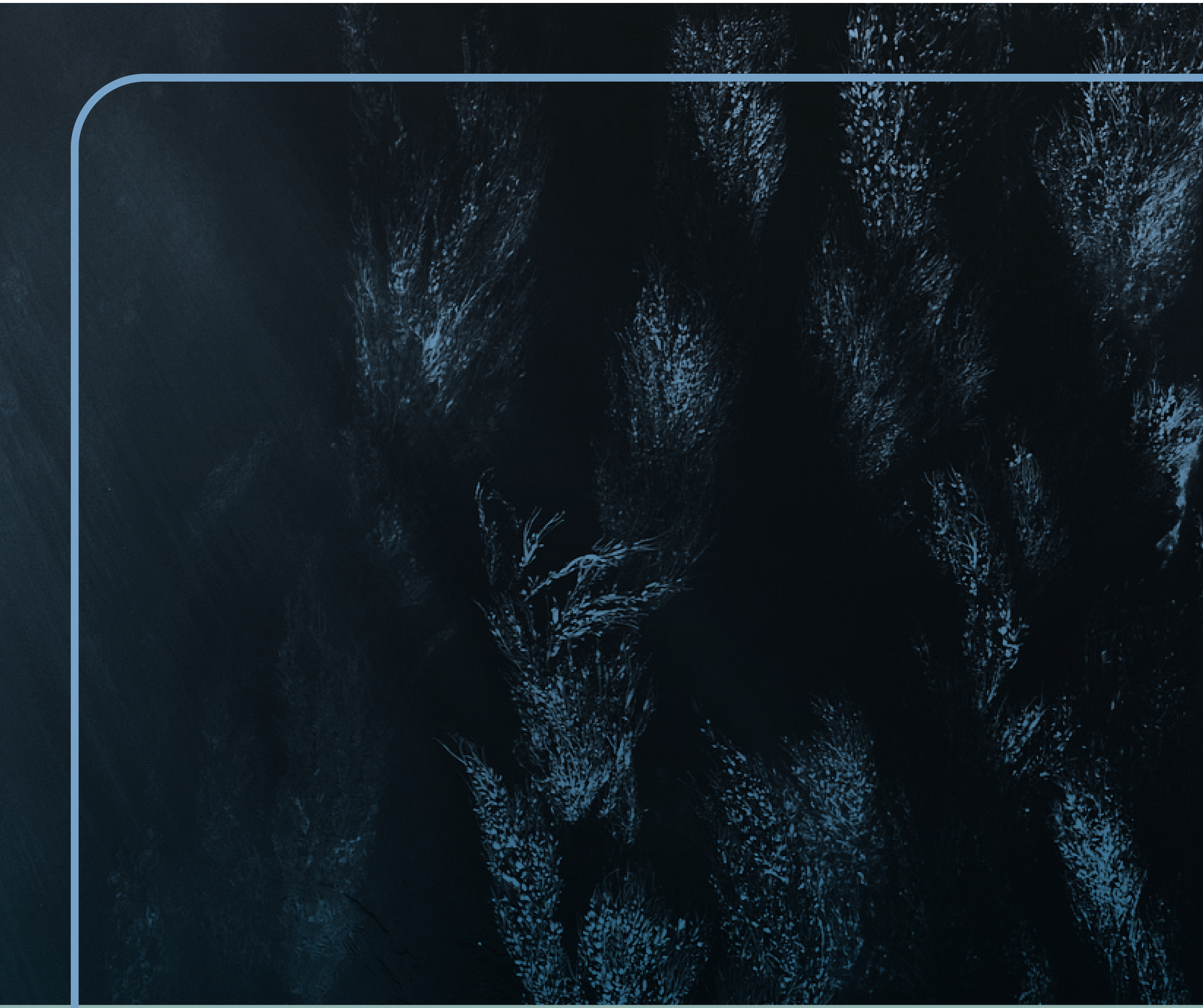
REGAL FRITILLARY



TRUMPETER SWAN

Table 1.2: List of protected species within Freeborn County (MNDNR, 2021)

COMMON NAME	GROUP	FEDERAL STATUS	STATE STATUS
Butternut	Vascular Plant	None	Endangered
Loggerhead Shrike	Bird	None	Endangered
Western Prairie Fringed Orchid	Vascular Plant	Threatened	Endangered
Blanding's Turtle	Reptile	None	Threatened
Edible Valerian	Vascular Plant	None	Threatened
James' Sedge	Vascular Plant	None	Threatened
Sullivant's Milkweed	Vascular Plant	None	Threatened
Tuberous Indian-plantain	Vascular Plant	None	Threatened
Beaked Snakeroot	Vascular Plant	None	Special Concern
Common Gallinule	Bird	None	Special Concern
Iowa Skipper	Insect	None	Special Concern
Ozark Minnow	Fish	None	Special Concern
Purple Martin	Bird	None	Special Concern
Rattlesnake Master	Vascular Plant	None	Special Concern
Redfin Shiner	Fish	None	Special Concern
Regal Fritillary	Insect	None	Special Concern
Small White Lady's-slipper	Vascular Plant	None	Special Concern
Suckermouth Minnow	Fish	None	Special Concern
Trumpeter Swan	Bird	None	Special Concern
Wild Sweetwilliam	Vascular Plant	None	Special Concern
Yellow Pimpernel	Vascular Plant	None	Special Concern



CHAPTER 2.0
ISSUE PRIORITIZATION

2.0 ISSUE PRIORITIZATION

This chapter covers the information and data used, the process applied, and results of identifying priority issues. The process to identify priority resources is outlined in Chapters 3 and 4, according to each issue statement. In addition to stakeholder identified priority issues and concerns, existing data and studies were used to the extent possible to create an understanding of the context of resource conditions. With this understanding, priority issues and resources were determined using a systematic vetting process. First, defined criteria were established and then recommendations were developed at a small group level by applying the criteria to the issue or resource category. Recommendations were promoted from these small work groups to the Steering Committee, prior to submitting recommendations to the Policy Committee for approval. The Advisory Committee reviewed the recommendations at key points throughout the prioritization process to provide further refinement of the Steering Committee's recommendations.

DATA COLLECTION

- Reports
- Meetings
- Comment Letters

RESOURCE CATEGORIES

- Emerging Issues
- Groundwater
- Leadership
- Natural Resources
- Quality of Life
- Surface Water
- Process

REPRESENTING

- Values
- Concerns
- Strategies

1
KICKOFF MEETING

PRIORITY ISSUE (N.)

The agreed upon issues that are identified as the focus of the Plan through a prioritization process.

OUTCOME (N.)

The specific result of an implementation activity. Collectively, the outcomes from plan activities should achieve the stated measurable goals. Outcomes may also express changes in knowledge or behavior which lead to actions that contribute to measurable goals.

DESIRED FUTURE CONDITION (N.)

The long-term outcome or goal; the attributes (water quality, water availability, habitat quality) the Partnership is striving to attain, regardless of the time frame. The desired future condition (DFC) sets the direction for planning and future management. It should be described for priority water resources and reflect stakeholder interests.

2.1 ISSUE PRIORITIZATION PROCESS

Numerous sources of information were used to compile and evaluate a list of potential values, concerns, and strategies for prioritization of issues in the Shell Rock River and Winnebago River watersheds. Sources include related documents and reports as well as comment letters from local stakeholders and notes from a kickoff meeting.

Documents and Reports

Some of the related documents and reports reviewed include:

- Shell Rock and Winnebago River Watersheds Monitoring and Assessment Reports [MPCA, 2012; MPCA, 2018]
- Shell Rock and Winnebago River Watersheds Stressor Identification Reports [MPCA, 2014; MPCA, 2017]
- Shell Rock and Winnebago River Watersheds TMDLs [MPCA, 2021a; MPCA, 2020b]
- Shell Rock and Winnebago River Watersheds Restoration and Protection Strategy Reports (WRAPS) [MPCA, 2021b; MPCA, 2020a]
- Shell Rock River Winnebago Watershed Groundwater Restoration and Protection Strategies (GRAPS) Report [MDH, 2020]

Additionally, local county and city water management plans were summarized from the City of Albert Lea [City of Albert Lea, 2010] and Freeborn County [Freeborn County, 2016]. Watershed report cards, climate summaries, applicable legislation, a series of retrofit assessments and diagnostic studies, and numerous other water resources reports were also reviewed for the prioritization analysis.

Meetings

A kickoff meeting with 34 attendees was held in Albert Lea, Minnesota on August 21, 2019. Attendees were asked about qualities and characteristics valued in their community and natural environment, about major concerns and issues facing the natural resources in their community, and what strategies and future actions they think would be best to address challenges and achieve desired future conditions. These open-ended questions resulted in a wide range of comments to assist in the evaluation and summarization of priorities in the watershed. Attendee comments included values and concerns around surface water quantity, surface water quality, natural resources, and groundwater, as well as strategies and considerations for social systems.

Official Comment Letters

Additionally, comment letters with priority concerns were collected from local stakeholders. Comment letters were received from the following (see Appendix B):

- Minnesota Board of Water & Soil Resources (BWSR) on June 20, 2019
- Minnesota Department of Agriculture (MDA) on June 20, 2019
- Minnesota Department of Health (MDH) on June 24, 2019
- Minnesota Department of Natural Resources (MNDNR) on May 29, 2019
- Minnesota Pollution Control Agency (MPCA) on June 19, 2019

Issues, resources, and priorities gathered from the documents, reports, comment letters, and kickoff meetings were categorized as either a value, concern, or strategy. The values and concerns for each resource category were considered in drafting the issue statements. Strategies were considered later in the plan development process when actions were selected to address the issue statements.

Issues were also classified by resource category and subcategory. Occasionally, an issue fell under multiple resource categories and was assigned to all appropriate categories. Categories included Emerging Issues, Groundwater, Leadership, Natural Resources, Quality of Life, Surface Water, and Process. Subcategories for each of these are listed in Table 2-1 with the number of occurrences for each.

Kickoff Meeting

37
IDENTIFIED ISSUES IN 6 RESOURCE CATEGORIES

10
FINAL ISSUE STATEMENTS IN 3 RESOURCE CATEGORIES

5
ISSUE STATEMENT PRIORITY LEVELS

RESOURCE CATEGORIES

- Emerging Issues
- Groundwater
- Leadership
- Quality of Life
- Surface Water
- Process
- Natural Resources

Table 2-1: Categories and Subcategories Used to Group Background Information

CATEGORY	SUBCATEGORY	NUMBER OF OCCURRENCES
EMERGING ISSUES	Chlorides	0
	Climate Change and Resilience	6
	Contaminants of Emerging Concern	19
	Land Development and Changes	9
	Reduce Pesticide and Fertilizer Impacts	19
	Other	1
GROUNDWATER	Drinking Water Supply	12
	Groundwater Quality	25
	Groundwater Quantity	2
	Infiltration and Recharge	2
	Protect Groundwater Resources	18
	Other	0
LEADERSHIP	Administrative Priorities	18
	Collaboration	10
	Financing	20
	Maintenance	5
	Policy and Regulation [or Land Use Management]	33
	Public Outreach	22
	Stakeholder Involvement	13
	Other	0
NATURAL RESOURCES	Manage, Enhance, and Restore Habitat	53
	Fish Habitat	24
	Wetland Habitat	10
	Upland Habitat	22
	Invasive Species	17
	Preserve Prime Farmland	1
	Preserve Sites of High Ecological Value	13
	Protect Soil Health	24
	Other	0

Table 2-1: Categories and Subcategories used to Group Background Information

CATEGORY	SUBCATEGORY	NUMBER OF OCCURRENCES
QUALITY OF LIFE	Aquatic Consumption	2
	Aquatic Recreation	42
	Public Safety	10
	Other	0
SURFACE WATER	Altered Hydrology	31
	Drainage System Management	11
	Erosion and Sediment Control	41
	Flooding and Floodplain	8
	Protect Surface Water Resources	23
	Stormwater Management	12
	Surface Water Quality	163
	Water Rate and Quantity	17
	Other	0
PROCESS	IWIP Document	9
	IWIP Process	20
	Other	0

2.2 PRIORITY ISSUES AND ISSUE STATEMENTS

Draft issue statements were developed based on the results of the resource category and subcategories list in Table 2-1. The draft issue statements included three under the Surface Water category, five under the Natural Resources category, and two under the Groundwater category. The draft issue statements were presented to the Steering Committee in the October 24, 2019 meeting where members ranked the issue statements using a prioritization process called Q-sort. The same draft issue statements were then presented to the Advisory Committee in the December 16, 2019 meeting where they used a modified prioritization process and identified their priority issue statements. These exercises resulted in a priority ranking of all the issue statements. Minor adjustments were made to the ranking of the priority issues after the priority resources were identified and the implementation strategies and actions were developed. These adjustments were made to better align the priorities with the realities and constraints implementing the actions necessary to achieve measurable goals.

Issue statements were not developed for the Emerging Issues, Quality of Life, Process, and Leadership resource categories. The selected categories (Surface Water, Natural Resources, and Groundwater) are more relevant to address issues directly tied to physical resources. While priorities were identified in these excluded categories, implementation actions identified in this plan address these issue and are categorized within the final issue statements.

The priority issue statements were grouped into priority levels that indicate which issues will see a higher level of resources implemented throughout the planning period; with priority ranking in alphabetical order from A to E.

Table 2-2: Priority Issues and Issue Statements

PRIORITY LEVEL A	ISSUE STATEMENT
Surface Water Quantity - Surface Water Resources	Increased and accelerated runoff have caused elevated or fluctuating water levels which result in shoreland and streambank erosion. There is increased erosion and sedimentation issues from streambanks and shoreland areas, as well as from land management practices. These impacts may be compounded due to increased rates of extreme weather events.
Surface Water Quality - Surface Water Resources	Lakes and streams are threatened or impaired due to excess pollution including nutrients, sediment, and bacteria. These pollutants can cause eutrophication, impact aquatic life, and decrease recreational use opportunities.

PRIORITY LEVEL B	ISSUE STATEMENT
Erosion and Sediment Control - Surface Water Resources	Landscape and channel alterations have caused adverse impacts to hydrology such as localized flooding. There is a risk of increased flooding due to inadequate storage and this risk is compounded due to increased rates of extreme weather events.
Protect Soil Health - Natural Resources	Degraded soil health conditions have resulted in reduced agricultural production, decreased nutrient and water holding capacity, decreased infiltration, and increased erosion across the landscape.

PRIORITY LEVEL C	ISSUE STATEMENT
Protect Sites of High Ecological Value - Natural Resources	The remaining sites of high ecological value are at risk of degradation and may need protection and enhancement.
Restore Wetland and Upland Habitat - Natural Resources	Land use alterations have reduced, degraded, and decreased the quality and abundance of upland and wetland habitat.
Groundwater Quantity and Quality - Groundwater Resources	Groundwater and drinking water supplies are threatened by human actions as well as naturally occurring contaminants. There may be areas that have low groundwater volume which could be impacted by high-capacity wells.

Table 2-2: Priority Issues and Issue Statements

PRIORITY LEVEL D	ISSUE STATEMENT
Improve Degraded Aquatic Habitat - Natural Resources	Fish and macroinvertebrate populations are threatened by a lack of habitat, poor biological quality, channelized streams, altered hydrology, and poor water quality due to high sediment loading and algal blooms.
Invasive Species - Natural Resources	Invasive species threaten the health and quality of upland, wetland, riparian, and aquatic ecosystems. Invasive species need to be controlled to reduce their impact.

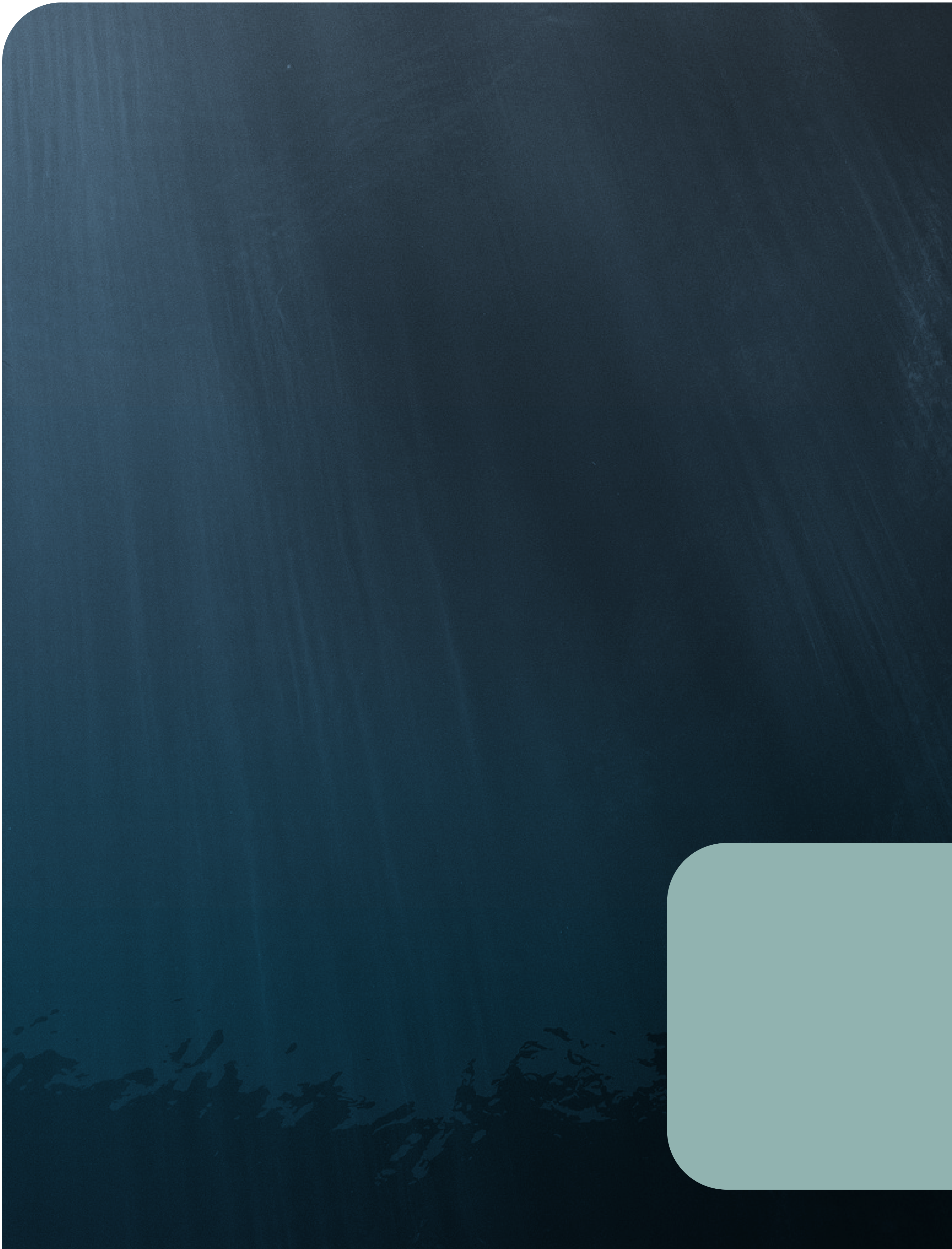
PRIORITY LEVEL E	ISSUE STATEMENT
Groundwater Protection - Groundwater Resources	Groundwater recharge areas (and particularly karst areas and coarse textured soils) of watershed within the planning area are vulnerable to contamination and need to be protected and understanding of groundwater resources needs to be improved.

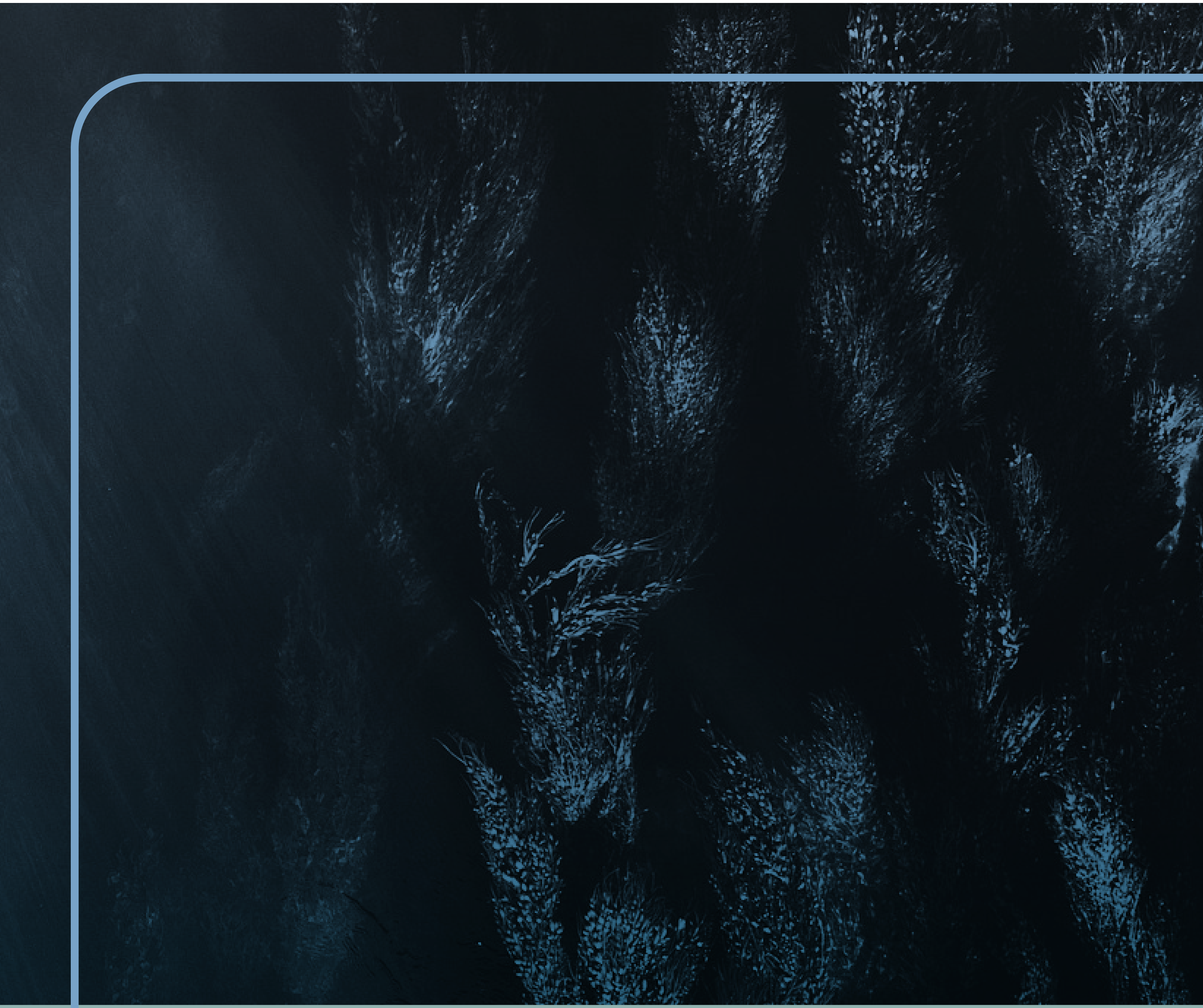
2.3 EMERGING ISSUES

This Plan is based on existing knowledge and evaluation of existing concerns. However emerging issues may require a shift in focus or may influence the implementation plan priorities and actions. There were four general categories of emerging issues that were identified in the aggregated data (Table 2-3). One emerging issue, climate change, was deemed to be a priority while multiple strategies under land development and changes were identified as priorities and were incorporated into the Plan's implementation table. The Partnership integrated action items that aim to alleviate impacts of climate change which include implementing water storage projects and tracking urban flooding in Albert Lea. Details on climate trends are presented in more detail in Appendix F. The Partnership will continue to monitor emerging issues throughout the planning period to ensure the implementation actions address the active issues.

Table 2-3: Emerging Issues Identified by Stakeholders

CATEGORY	SUBCATEGORY	NUMBER OF OCCURRENCES
Emerging Issues	Climate Change and Resilience	6
	Contaminants of Emerging Concern	19
	Land Development and Changes	9
	Reduce Pesticide and Fertilizer Impacts	19
	Other	1





CHAPTER 3.0

PRIORITY ISSUES AND MEASURABLE GOALS

3.0 PRIORITY ISSUES AND MEASURABLE GOALS

Following the selection and ranking of priority issue statements that are presented in Chapter 2, the Partnership developed a framework for each issue statement. The framework defines a desired future condition, goals, priority resources, and targeting, for each issue statement. This framework served as an outline that guided the process to develop measurable goals and targeted implementation schedule that is described in Chapter 4. Many of the Plan's issues are interrelated, therefore the focus when developing this framework and throughout the planning process was to use a multiple benefits approach when identifying priority areas and implementation practices that achieve the issue statement goals.

The framework for each issue statement that includes the priority resource targeting approach and final measurable goals are summarized in this section and are organized in order of issue statement priority. For the entire issue statement framework document developed by the partnership see Appendix D.

MEASURABLE GOALS + TARGETED IMPLEMENTATION ACTIONS

A significant amount of data gathering and a series of meetings, both in-person and online, were conducted to gather a wide net of information, data, and recommendations, to consolidate them into identifiable and measurable goals and targets.

3.1 ISSUE STATEMENT A1: SURFACE WATER QUANTITY

Landscape and channel alterations have caused adverse impacts to hydrology such as localized flooding. There is a risk of increased flooding due to inadequate storage and this risk is compounded due to increased rates of extreme weather events.

Desired Future Condition

Eliminate localized flooding during extreme weather events.

GOAL 1

Increase water storage to reduce downstream impacts.

MEASURABLE OUTCOME

Implement projects that store 6,247 acre-feet over the 10-year planning period.

PRIORITY RESOURCES AND TARGETING

Water storage is a watershed-wide goal that will be achieved through implementation of restored wetlands and cover crops. Restored wetlands reduce total runoff through increased infiltration, evaporation, and evapotranspiration while cover crops increase soil organic matter which in turn helps the soil retain more moisture and reduce runoff. Since these implementation actions are a part of addressing the water quality goals, the implementation targeting will be driven largely by the water quality benefits they provide to priority resources. Therefore, priority resources and targeting for these implementation actions followed the process identified in the water quality issue statement A2 and process described in Chapter 4. The outcomes of this targeting process identified the total area and location of cover crops and restored wetlands that will be implemented as a part of this plan. Using these areas, the total water storage was calculated using the HSPF model for restored wetlands and the cover crop storage assumption approach defined in the side bar. Combining the totals from these two approaches resulted in the cumulative water storage outcome for this goal. Achieving the measurable outcome for this goal will work towards accomplishing the goals referenced in the WRAPS reports of reducing peak stream flows by 15% in the Shell Rock River Watershed and 20% in the Winnebago River Watershed. While the measurable water storage goal will be achieved through implementation of restored wetlands and cover crops, efforts will be made to identify opportunities for large-scale storage projects across the planning area. Additionally, planning partners will collaborate with the drainage authority to advocate for alternative approaches to drainage management such as 3:1 ditch side slopes and controlled tile drainage.

During implementation, resources will be used to target at the field scale and includes:

- Restorable Wetland Prioritization Tool developed by the University of Minnesota and MPCA
- Restorable Wetland sites identified in Bancroft Creek area study
- County Ditch 23 (Steward Creek) Drainage Water Management Plan
- Sites identified in the Draft TMDL Implementation Plan [Barr, 2013]
- BMP Spreadsheet Targeting Tool [RESPEC, 2020]

Cover Crop Storage Assumptions

Assumptions were made to estimate the amount of water storage that would be associated with increased cover crop implementation. The assumptions were based on the relationship between increasing soil organic matter through adoption of cover crops and that increase in soil organic matter resulting in additional water storage. It was assumed that adding cover crops will increase soil organic matter by 0.1% annually. It was also assumed that an increase in soil organic matter of 0.1% would result in 2,000 gallons of water, or 0.0062 acre-ft/yr (2000 gallons = 268 cubic feet / 43,450 feet squared) of storage. The planned timing of implementation for cover crops was then used to calculate a cumulative storage amount. This approach was provided to the planning partnership by BWSR staff and will be updated if better information is made available during the 10-year planning period.

GOAL 2

Reduce the frequency and intensity of flooding.

MEASURABLE OUTCOME

Locations and duration of flooding in the City of Albert Lea will be documented. Building a record of localized flooding events will lead to a better understanding, helping to drive future management decisions and ultimately lead to a reduction in flooding incidents

PRIORITY RESOURCES AND TARGETING

Concerns over localized flooding following large rain events was brought up throughout the planning process, specifically for the City of Albert Lea. Tracking of flooding locations throughout the City will be conducted to develop a consistent record of the issue. The City will record water elevations at each location of flooding, each day during the flooding period. This takes approximately two hours per day during the event. This information will be used to guide future implementation projects in the City as deemed necessary and if project funds are secured. Additionally, actions to meet Goal 1 of this issue statement will increase upland water storage that will reduce the amount of water reaching certain areas of the City.

Specific locations of flooding in the City of Albert Lea that have been previously recorded and will continue to be tracked include:

- Lakeview Boulevard and Willamore Road
- South Broadway and East 5th Street
- West Main Street and St. Mary Avenue
- Lincoln Avenue
- South 4th Avenue and Plainview Lane

Albert Lea Lake water control structure

City of Albert Lea Flooding (2004)

3.2 ISSUE STATEMENT A2: SURFACE WATER QUALITY

Lakes and streams are threatened or impaired due to excess pollution, including nutrients, sediment, and bacteria. These pollutants can cause eutrophication, impact aquatic life, and decrease recreational use opportunities.

Desired Future Condition

All lakes and streams meet or exceed MPCA standards for aquatic life and recreational use.

Albert Lea Lake

Pickerel Lake Dam

Fountain Lake

GOAL 1

Improve lake water quality by decreasing total phosphorus concentrations.

MEASURABLE OUTCOME

Average summer total phosphorus (TP) concentrations will be reduced to 207 ug/L for Albert Lea Lake, 143 ug/L for Pickerel Lake, 256 ug/L for Fountain Lake West, and 244 ug/L for Fountain Lake East, while current TP concentrations will be maintained for the remaining lakes.

PRIORITY RESOURCES AND TARGETING

There are 13 lakes in the planning area that have data to develop the two sets of metrics that were evaluated to prioritize lakes. The first set of metrics are based on physical characteristic and include lake size to drainage area, lake land use disturbance, percent mean phosphorus (P) from standard, and water clarity trend. The second set of metrics for prioritizing lakes is based on the economic and recreational importance of each lake according to stakeholder surveys. Each metric ranged in value from zero to one, with the final score equal to the average of the metric scores with a heavy weight applied to the stakeholder value. A detailed summary of the lake metric analysis and metric values are included in Appendix D.

As a result of the metric analysis, lakes were ranked in value. Since there are only 13 lakes in the planning area, with each providing some level of important habitat and recreational value, all lakes are a priority. However, as a result of the analysis the top tier priority lakes are the three most valuable lakes according to the stakeholder survey. A summary of the metric results, priority tier, and location of each waterbody is shown in Table 3-1.

Additionally, two waterbodies were identified by planning partners as local priorities despite not having lake monitoring data. While the DNR does not label these waterbodies as lakes, they are deep wetlands identified as lakes in local references and are priorities for habitat projects.

Table 3-1: Priority Lakes

OVERALL METRIC RANK	PRIORITY TIER	LAKE NAME	CURRENT TP CONCENTRATION (UG/L)**	MANAGEMENT ZONE
1	1	Albert Lea	219	Albert Lea Lake
2	1	Pickerel	147.7	Fountain Lake
3	1	Fountain Lake	272 (West) 259.7 (East)	Fountain Lake
4	2	State Line	550	Winnebago River
5	2	White	178.8	Fountain Lake
6	2	Bear	262	Winnebago River
7	2	Goose	190	Fountain Lake
8	2	Upper Twin	267.4	Shell Rock River Outlet
9	2	Lower Twin	170.2	Shell Rock River Outlet
10	2	Halls	99.7	Fountain Lake
11	2	School Section	365.9	Fountain Lake
12	2	Mud	147	Fountain Lake
13	2	Sugar	84	Fountain Lake
14	2	Eberhart*	N/A	Shell Rock River Outlet
15	2	Church*	N/A	Shell Rock River Outlet

*Waterbodies identified by stakeholders as priorities and will be targeted for habitat projects
**TP data from 2020 monitoring season

Shell Rock River

Winnebago River

GOAL 2

Improve stream water quality by reducing E. coli, nutrient, and TSS source loading and implement practices that reduce flow alteration.

MEASURABLE OUTCOME

- Replace or upgrade 40 failing or non-compliant septic systems.
- Bring three feedlots into compliance with existing regulatory requirements.
- Ensure feedlots that are expanding maintain necessary management practices.
- Minimum daily dissolved oxygen (DO) concentrations will be above 5 mg/L and mean growing season DO flux will stay below 5 mg/L for stream reaches with current monitoring.
- Achieve TP and TSS pollutant reductions at outlets to tier 1 priority lakes as shown in Table 3-2. These values reflect the modeled reductions for TP and TSS from implementing the planned actions identified in this plan. The actions called for in the implementation schedule to address TP and TSS will also treat Total Nitrogen (TN). The MPCA's nitrogen reduction goals are summarized in the respective watersheds WRAPS reports and call for a 45% reduction in TN in the Shell Rock River Watershed and a 20% reduction in TN in the Winnebago River Watershed.

PRIORITY RESOURCES AND TARGETING

Priority streams include streams impaired for E.coli and streams that outlet into the top tier priority lakes (Table 3-1). Measurable outcomes for streams that outlet into top tier priority lakes are linked to the TP and TSS reductions identified for those lakes and are shown in Table 3-2. Implementation actions to achieve the pollutant reductions are based on the prioritization approach described in Chapter 4 that targets actions that provide multiple benefits in headwater areas. Efforts to address feedlots will focus on locations with the most significant infractions, and septic upgrades/replacements will be targeted to the highly vulnerable groundwater areas (Figure 1-8) as a highest priority.

Table 3-2: Major Outlets to Top Priority Lakes

STREAM NAME	MANAGEMENT ZONE	PRIORITY STREAM DUE TO:		RECEIVING PRIORITY LAKE	EXISTING TP LOAD (LBS/YR)	TP REDUCTION (LBS/YR)*	EXISTING TSS LOAD (TONS/YR)	TSS REDUCTION (TONS/YR)*
		E, COLI IMPAIRMENT	OUTLETS TO TIER I PRIORITY LAKE					
Wedge Creek	Fountain Lake	●	●	Fountain Lake	16,845**	1,222 (7%)	1,478***	224 (15%)
Bancroft Creek	Fountain Lake	●	●	Fountain Lake	17,748**	1,434 (8%)	1,425***	237 (17%)
Shoff Creek	Fountain Lake		●	Fountain Lake	4,810**	535 (11%)	500***	87 (17%)
Peter Lund Creek	Albert Lea Lake		●	Albert Lea Lake	13,003**	1,177 (9%)	792***	142 (18%)
Shell Rock River	Shell Rock River	●		N/A	132,042***	3,978 (3%)	8,641***	116 (1%)
Lime Creek	Winnebago River	●		N/A	8,316***	513 (6%)	3,253***	71 (2%)
				Total	**192,764**	**8,860 (5%)**	**16,089**	**877 (5%)**

*Reductions calculated from spreadsheet targeting tool and calibrated HSPF model.
** Existing loads are from approved 2021 TMDL
***Existing loads are from calibrated HSPF Model

3.1 ISSUE STATEMENT B1: EROSION AND SEDIMENT CONTROL

Increased and accelerated runoff have caused elevated or fluctuating water levels which result in shoreland and streambank erosion. There is increased erosion and sedimentation issues from streambanks and shoreland areas due to channel alterations, land use disturbance, drainage, and from land management practices. These impacts may be compounded due to increased rates of extreme weather events.

Desired Future Condition

Excessive erosion and sedimentation is controlled.

GOAL 1

Reduce overland runoff.

MEASURABLE OUTCOME

- Implement urban stormwater management practices in the City of Albert Lea over the 10-year plan period
  - Install a minimum of two raingardens
  - Install a minimum of two retention ponds
  - Install a minimum of two stormwater ponds
  - Replace two Sweeper units
- TSS reductions achieved through implementing BMPs that address Issue Statements A1 and A2
- Increase/promote stormwater management through outreach and education (e.g. street sweeping) in smaller urban areas

PRIORITY RESOURCES AND TARGETING

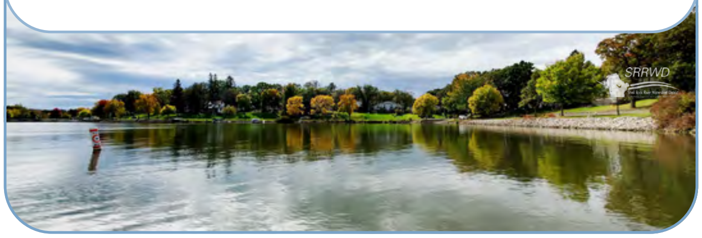
Priority areas to address this issue include the City of Albert Lea as well as smaller municipalities that express interest through the outreach and education efforts regarding stormwater management. Specific site locations for raingardens and stormwater ponds have been identified in previous studies of the area and are included in the city's capital improvement plan [City of Albert Lea, 2020].

GOAL 2

Reduce shoreline and streambank erosion.

MEASURABLE OUTCOME

Stabilize a minimum of 9,800 linear feet of eroding and failing streambanks and shoreline and complete inventory of failed streambanks.



PRIORITY RESOURCES AND TARGETING

Through outreach and coordination with landowners in the planning area, projects have been identified to stabilize 9,800 linear feet of streambanks which is the top priority to address this goal. Following completion of these projects a field inventory will be conducted throughout the watershed to identify additional locations that would be candidates for streambank restoration projects. Following the completion of the inventory, the planning partners will look to secure funding for restoration projects. Planning partners will coordinate with the MNDNR to explore opportunities to apply approaches such as natural channel design to restore the natural function and sustainability of impaired reaches. If implemented, these projects would help address water quality and habitat concerns identified in this plan.

3.2 ISSUE STATEMENT B2: PROTECT SOIL HEALTH

Degraded soil health conditions have resulted in reduced agricultural production, decreased nutrient and water holding capacity, decreased infiltration, and increased erosion across the landscape.

Desired Future Condition

Implement practices to improve soil health which will lead to increased agricultural production, increased nutrient and water holding capacity, increased infiltration, and decreased erosion. Adopting practices to increase soil health such as planting cover crops, practicing reduced or no tillage, crop rotations, and rotational or prescribed grazing will help achieve the five soil health principals: soil armoring, minimizing soil disturbance, plant diversity, continual live plant/root, and livestock integration.

GOAL 1

Better understand current implementation of soil health practices in the planning area.

MEASURABLE OUTCOME

Identify and quantify the existing efforts to improve soil health across the planning area, which includes implementation of cover crops, or no-till practices, to establish a baseline level of implementation. Outreach and education efforts to inform landowners of soil health practices and opportunities will continue (one winter workshop, one fall field day, 12 posts on social media per year, enter information into *Farming in the Heartland* twice a year, provide *No-Till Farmer Online/Magazine* subscriptions to local landowners).

PRIORITY RESOURCES AND TARGETING

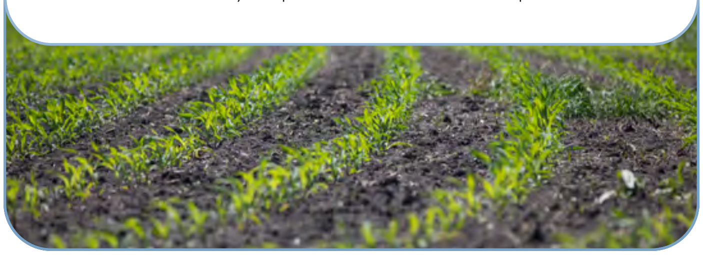
Addressing this issue concern is a watershed-wide effort and will leverage the best available information to estimate the amount of acres currently implementing cover crops or other practices that improve soil health.

GOAL 2

Increase the number of soil health practices on agricultural land.

MEASURABLE OUTCOME

9,984 acres of newly implemented soil health practices.



PRIORITY RESOURCES AND TARGETING

Meeting this measurable goal will be accomplished through implementing cover crops in the areas targeted for issue statements A1 and A2. Additional efforts to promote Nutrient Management Plans and BMPs will be done where opportunities arise with interested landowners.

Soil Health

Soil health is defined by the NRCS as "the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.". Healthy soil is vital to support plant growth and sustain natural processes that are key in breaking down nutrients and reducing excess runoff. This plan measures soil health through the implementation of practices that improve soil health.

3.3 ISSUE STATEMENT C1: PROTECT SITES OF HIGH ECOLOGICAL VALUE

The remaining sites of high ecological value are at risk of degradation and may need protection and enhancement.

Desired Future Condition

Significant portions of native habitat have been restored. Resources of high ecological value are protected and expanded.

GOAL 1

Protect and enhance outstanding, high, and moderate biologically significant areas in the planning area.

MEASURABLE OUTCOME

Enhance at least 190 acres of biologically significant areas and expand protected area adjacent to biologically significant areas.

PROTECT

Land held in perpetual easement, as well as state and federal lands.

ENHANCE

Remove or replace less desirable or invasive plants with native plants.

RESTORE

Create new habitat by changing landuse (i.e. changing row crops to native planting).

PRIORITY RESOURCES AND TARGETING

There are a number of key habitat areas throughout the planning area that require protection, enhancement, and restoration. Restoring landcover to perennial cover and restoring wetlands are Best Management Practices (BMPs) used to address water quality, but will also be used to restore and expand key habitat areas. While targeting implementation locations for these BMPs is largely based on addressing water quality following the approach described in Chapter 4, however; additional factors will be considered when implementing these BMPs to also address this issue concern. These factors include targeting areas adjacent to critical habitat areas, areas of biological or biodiversity significance, and considering the size of habitat restoration potential by prioritizing larger areas. These locations are shown in Figure 3-1 and overlaid with the targeting heat map in Figure E-5, which will be used during implementation to guide targeting efforts. The estimate of habitat enhanced and protected was based on the amount of existing critical habitat area. For example, if a drainage area has 5% of its area classified as critical habitat a minimum of 5% of the perennial cover and wetland restoration projects should be adjacent to these areas if possible. The results of this targeting approach will balance the water quality impacts of restoring perennial cover while targeting specific areas that improve habitat resources.

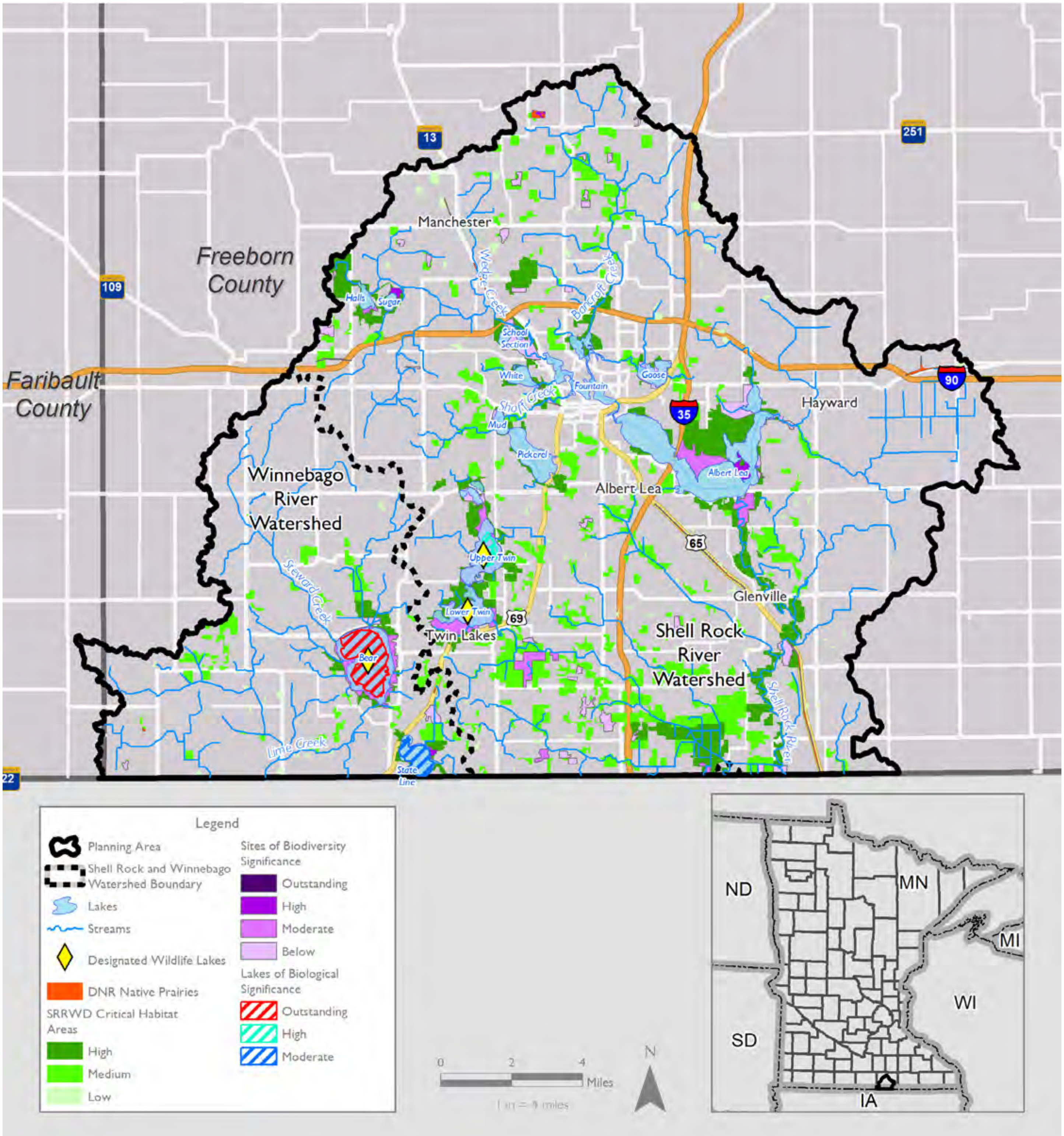


Figure 3-1: Biologically Significant and Critical Habitat Areas in the Planning Area

3.4 ISSUE STATEMENT C2: RESTORE WETLAND AND UPLAND HABITAT

Land use alterations have reduced, degraded, and decreased the quality and abundance of upland and wetland habitat.

Desired Future Condition

Significant portions of upland and wetland areas are restored.

GOAL 1

Restore altered wetlands and degraded upland habitat.

MEASURABLE OUTCOME

- Restore 1,728 acres of upland habitat.
- Restore 1,245 acres of wetland habitat.

PRIORITY RESOURCES AND TARGETING

Upland habitat restoration areas will align with projects implemented to address issue statement C1, while wetland habitat restoration will be accomplished through implementing restored wetlands targeted in issue statements A1 and A2 and wetland projects identified in previous work. Projects identified in previous work to secure grant funding from Lessard-Sams Outdoor Heritage Council (LSOHC) include four separate sites that total roughly 528 acres in area. Additional sites with potential for habitat restoration have been identified and added to the implementation schedule as Tier C funding projects. If possible, habitat restoration projects will consider plant species that enhance pollinator populations throughout the planning area.

3.5 ISSUE STATEMENT C3: GROUNDWATER QUANTITY AND QUALITY

Groundwater and drinking water supplies are threatened by human actions as well as naturally occurring contaminants. There may be areas that have low groundwater volume which could be impacted by high capacity wells.

Desired Future Condition

To have sustainable, drinkable groundwater.

GOAL 1

Reduce the risk of groundwater contamination.

MEASURABLE OUTCOME

- Replace and upgrade 40 failing or non-complaint septic systems.
- Bring three feedlots into compliance with existing regulatory requirements.
- Ensure feedlots that are expanding maintain necessary manure management practices.
- Seal five unused or abandoned private wells per year.
- Conduct outreach and education activities to increase awareness on arsenic in groundwater.

PRIORITY RESOURCES AND TARGETING

This is a watershed-wide priority that builds on existing efforts to protect drinking water from threats such as unused or abandoned wells, nitrate pollution, and other contaminants that make drinking water unsafe. These efforts include Freeborn County's cost share program to replace failing septic systems, inspecting feedlots for compliance, sealing unused or abandoned private wells, and conducting outreach and education. The existing septic cost-share program will be targeted to residents who qualify and will be conducted on a first come first serve basis. Through outreach and education efforts it is the hope of the planning partnership to increase awareness and understanding of pollutant risks to drinking water, particularly arsenic. Additionally, outreach and education will be used to increase awareness of the importance of sealing unused or abandoned private wells. If interest in sealing wells increases, wells in areas of higher groundwater pollutant sensitivity will be prioritized. Results of monitoring from these planning efforts will be shared with relevant state agencies such as MNDNR, MDH, and MDA.

Septic tank install

Mound septic system construction

Septic system mound

Photos courtesy of Freeborn County

3.6 ISSUE STATEMENT DI: IMPROVE DEGRADED AQUATIC HABITAT

Fish and macroinvertebrate populations are threatened by a lack of habitat, poor biological quality, channelized streams, altered hydrology, and poor water quality due to high sediment loading and algal blooms.

Desired Future Condition

Habitats that fully support fish and macroinvertebrate communities.

GOAL 1

Restore aquatic habitat.

MEASURABLE OUTCOME

- Implement projects targeting biologically impaired stream reaches that address causes identified in Stressor Identification reports [MPCA 2014; MPCA 2017].
- Restore habitat in ten shallow lakes.
- Restore habitat in Fountain lake through dredging and creating in-lake habitat structures.
- Outreach and education on shoreland management and benefits of maintaining buffer along shoreline.

PRIORITY RESOURCES AND TARGETING

Implementation actions are necessary to improve aquatic habitat. The planning team's goal is to implement habitat restoration projects on 10 lakes over the planning period, but recognizes the challenges that can occur to get projects permitted and implemented. Therefore, projects will be targeted for waterbodies as opportunities or needs arise that address degrading habitat conditions. All 13 lakes are priorities if projects are identified but specific lakes that will be targeted include: Albert Lea Lake, Fountain Lake, Bear Lake, Halls Lake, Upper and Lower Twin Lakes, State Line Lake, and Goose Lake. Implementation of projects will also build on previous work completed in the planning area. This includes completion of the Fountain Lake dredging project which will improve water quality that contributes to degraded habitat, working with the MNDNR to use drawdown structures as deemed necessary, and implementing projects identified in previous watershed work. Targeting efforts will also leverage the results of the MPCA's Stressor Identification Reports [MPCA 2014; MPCA 2017] to align implementation actions that address identified stressors to the local fish and bug communities. The Stressor Identification Reports identify stressors to the local biological communities using the macroinvertebrate index of biological integrity (MIBI) and fish index of biological integrity (FIBI) scores. By tracking the outcomes of these studies and any additional biological data made available as a part of this plan, the partnership will have a better understanding of habitat stressors. Implementation actions to address this goal include building on previous work, projects aimed at improving water quality that contributes to degraded habitat, and shoreland/streambank habitat restorations.

GOAL 2

Manage carp population, abundance, and distribution.

MEASURABLE OUTCOME

Maintain carp so they do not exceed desirable levels (100kg/hectare) [WSB Engineering, 2020].

PRIORITY RESOURCES AND TARGETING

Managing carp populations will be targeted to lakes with known carp populations.

Fountain Lake dredging project

GOAL 3

Enhance and restore native aquatic vegetation.

MEASURABLE OUTCOME

- Increased seeding and planting of native plants during restoration.
- Outreach and education on impacts from certain water recreation sports.

PRIORITY RESOURCES AND TARGETING

Outreach and education will be done to increase public understanding of various shoreland management options as well as recreational impacts on shoreline and aquatic habitats. Additionally, proper native seed mixes will be used during any restoration project.

3.7 ISSUE STATEMENT D2: INVASIVE SPECIES

Invasive species threaten the health and quality of upland, wetland, riparian, and aquatic ecosystems. Invasive species need to be controlled to reduce their impact.

Desired Future Condition

Invasive species have been controlled and no longer impact native ecosystems.

Carp Tagging

GOAL 1

Reduce aquatic invasive species impact to waterbodies.

MEASURABLE OUTCOME

- Manage aquatic invasive species in lakes, such as carp, when identified.
- Outreach and education events on invasive species management (educate on all aquatic invasives).

PRIORITY RESOURCES AND TARGETING

Efforts to address aquatic invasive species will be targeted at priority lakes with public landings and projects already identified from previous work conducted in the planning area.

GOAL 2

Reduce the area of wetland and upland impacted by invasive species.

MEASURABLE OUTCOME

Implement one invasive species management plan to reduce impacts from invasive species.

PRIORITY RESOURCES AND TARGETING

Implementation actions that address upland invasive species will be tied to actions that address higher priority issues and are in close proximity to high priority waterbodies. For example, invasive species management plans will be tied into habitat restoration actions implemented to address Issue Statement C1 and C2. Included in the invasive species management plan will be actions to address public reports of invasive species including aquatic, terrestrial and agricultural species.

GOAL 3

No newly detected invasive species will become established.

MEASURABLE OUTCOME

- Maintain aquatic invasive species watercraft inspections.
- Establish an early detection and rapid response plan for Fountain Lake.
- Share aquatic invasive species topics monthly via watershed districts Facebook page and information in watershed districts email chain three times per year.

PRIORITY RESOURCES AND TARGETING

Efforts will be targeted to Fountain Lake for watercraft inspections and the development of an early detection and rapid response plan.

3.8 ISSUE STATEMENT EI: GROUNDWATER PROTECTION

Groundwater recharge areas (and particularly coarse textured soils) of watersheds within the planning area are vulnerable to contamination and need to be protected and understanding of groundwater resources needs to be improved.

Desired Future Condition

Increase protection in known highly vulnerable areas, improve understanding of groundwater resources, and increase educational opportunities to help public better understand their role in improving their drinking water resources.

GOAL I

Protect known highly vulnerable areas as identified in Figure 1-8.

MEASURABLE OUTCOME

Land use risk within highly vulnerable areas is reduced by 1,370 acres through conversion to permanent protection or implementation of cover crops.

PRIORITY RESOURCES AND TARGETING

Increased groundwater protection will be achieved through implementation of cover crops and perennial cover that address higher priority issues. A portion of these actions will be targeted in areas of high aquifer vulnerability as shown in Figure 1-7 and Figure E-1.

GOAL 2

Enhance and collaborate with existing wellhead protection planning efforts.

MEASURABLE OUTCOME

Support MDH's efforts to establish wellhead protection areas for two communities.

PRIORITY RESOURCES AND TARGETING

The partnership will collaborate with the Minnesota Department of Health's (MDH) efforts to establish wellhead protection areas in the planning area for at least two communities.

GOAL 3

Increase understanding of groundwater resources and human influences.

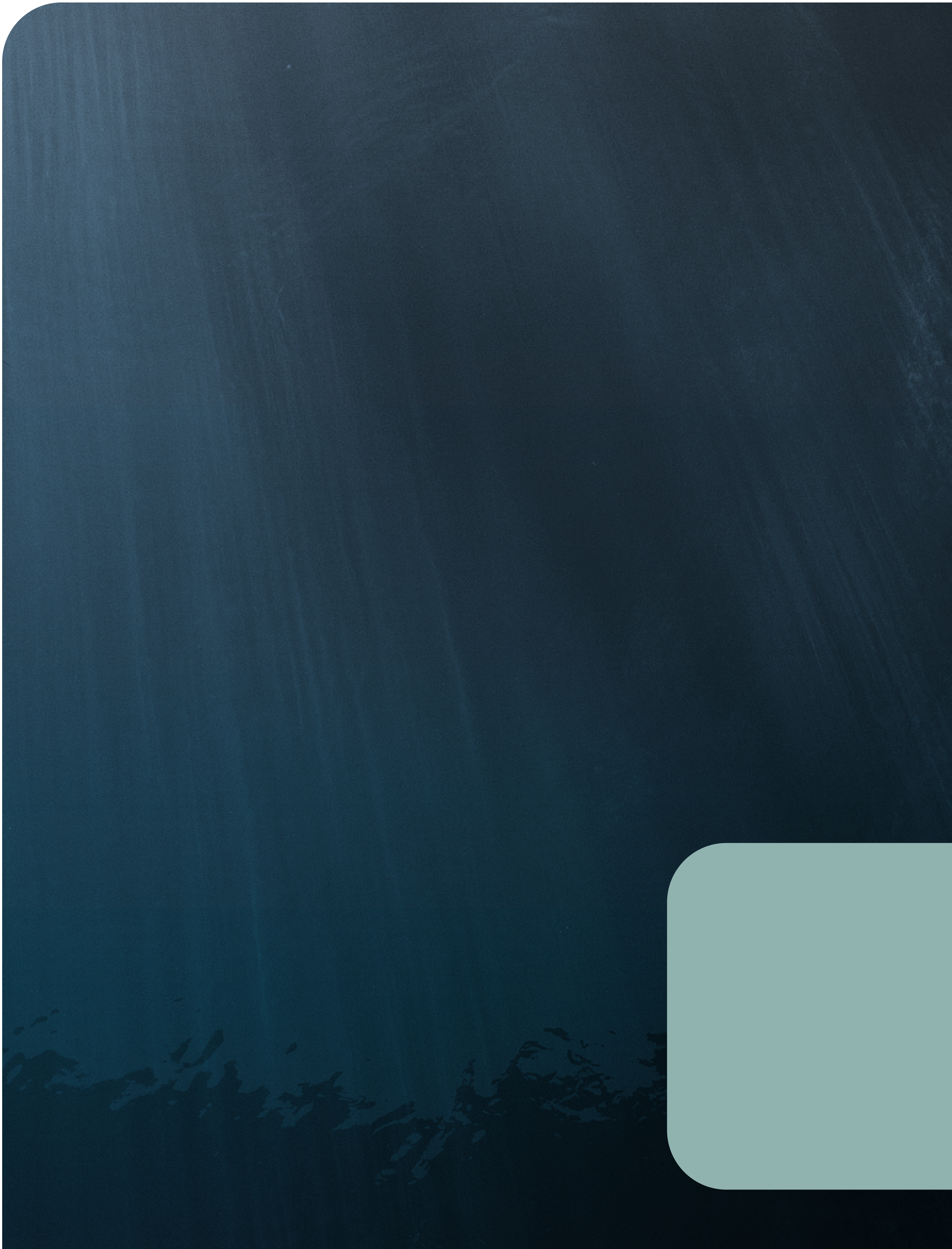
MEASURABLE OUTCOME

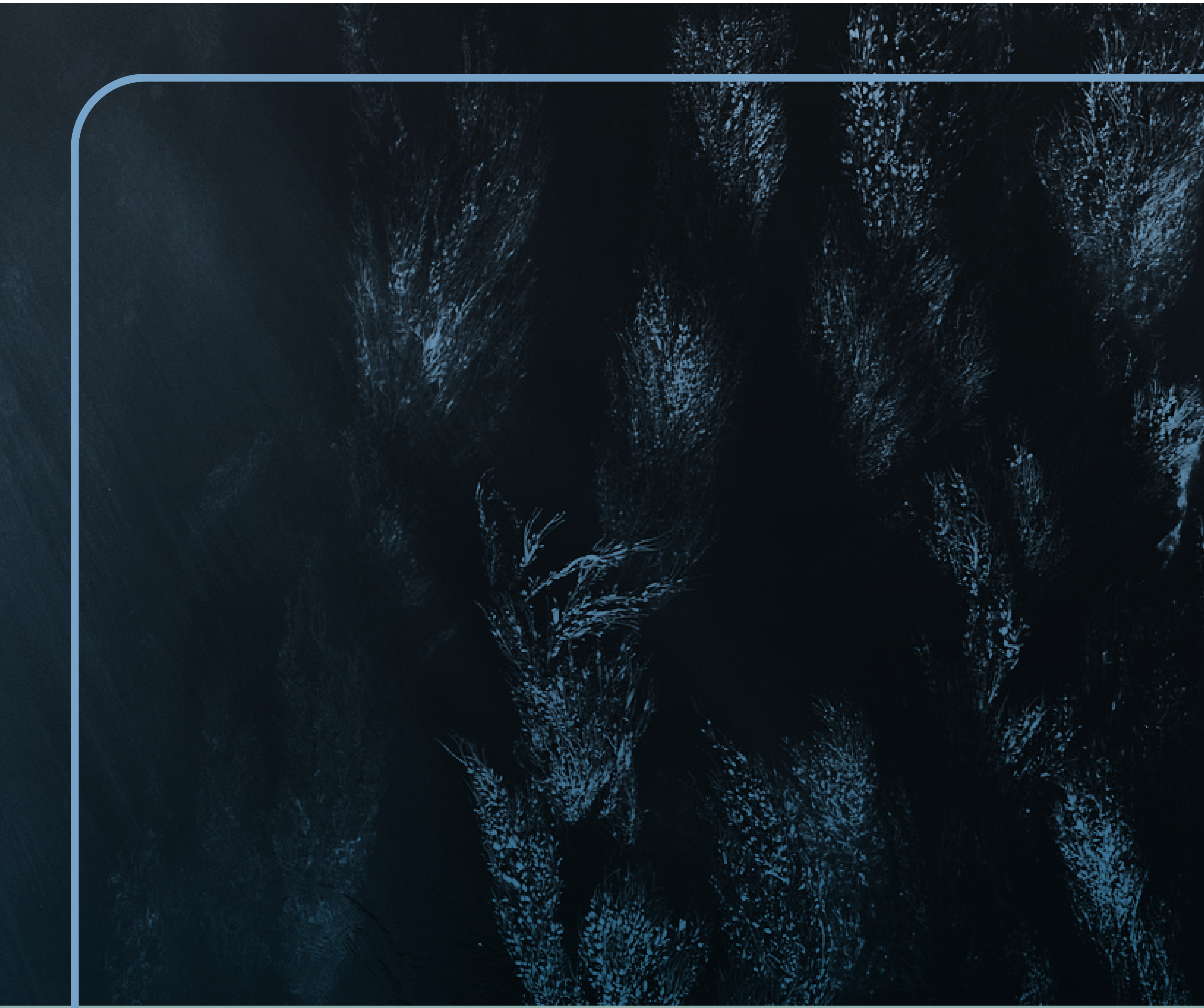
- Develop a County Geologic Atlas for Freeborn County and increase public awareness of human influences on groundwater quality.
- Track Nitrate test results above 3.0 mg/L.
- Ammonia levels in groundwater used for drinking water in the City of Albert Lea do not exceed 0.2 mg/L.

PRIORITY RESOURCES AND TARGETING

Freeborn County has begun coordinating with the University of Minnesota (UMN) and MNDNR to develop a County Geologic Atlas. Key information such as surface to groundwater connections gained from the county atlas will provide much of the necessary detail to further refine targeting of future implementation efforts focused on protecting groundwater. Additionally, efforts to track nitrate testing results by aggregating information from private wells and newly installed wells will be done immediately to leverage existing resources to better identify areas of concern.

Upper Twin pump station





CHAPTER 4.0

GEOGRAPHICAL MANAGEMENT ZONES AND IMPLEMENTATION

4.0 GEOGRAPHICAL MANAGEMENT ZONES AND IMPLEMENTATION

The planning area was divided into four management zones (Figure 4-1). These zones were created based on major drainage areas to priority resources. The management zones were then prioritized by the planning team to guide where in the watershed greater implementation efforts should be focused. The priority ranking of the management zones was based on two main factors, immediate drainage areas to priority waterbodies and areas upstream of multiple priority resources. Ranking management zones based on this criteria follows the consistent approach by the planning team to prioritize a multiple benefit approach.
When implementation efforts improve upstream priority resources, such as Fountain Lake, downstream resources benefit. This is supported in the Shell Rock River TMDL study that shows the boundary conditions or pollutants that come from the upstream waterbody are significant portions of the total load for Albert Lea Lake and Shell Rock River. Therefore, upstream drainage areas were prioritized as they will result in a cascading affect to multiple downstream resources. The priority ranking of management zones is shown in Table 4-1.

Table 4-1: Management Zone Priority Rank

PRIORITY RANK	MANAGEMENT ZONE
1	Fountain Lake
2	Albert Lea Lake
3	Shell Rock River Outlet
4	Winnebago River


FOUNTAIN LAKE


ALBERT LEA LAKE


SHELL ROCK RIVER OUTLET


WINNEBAGO RIVER

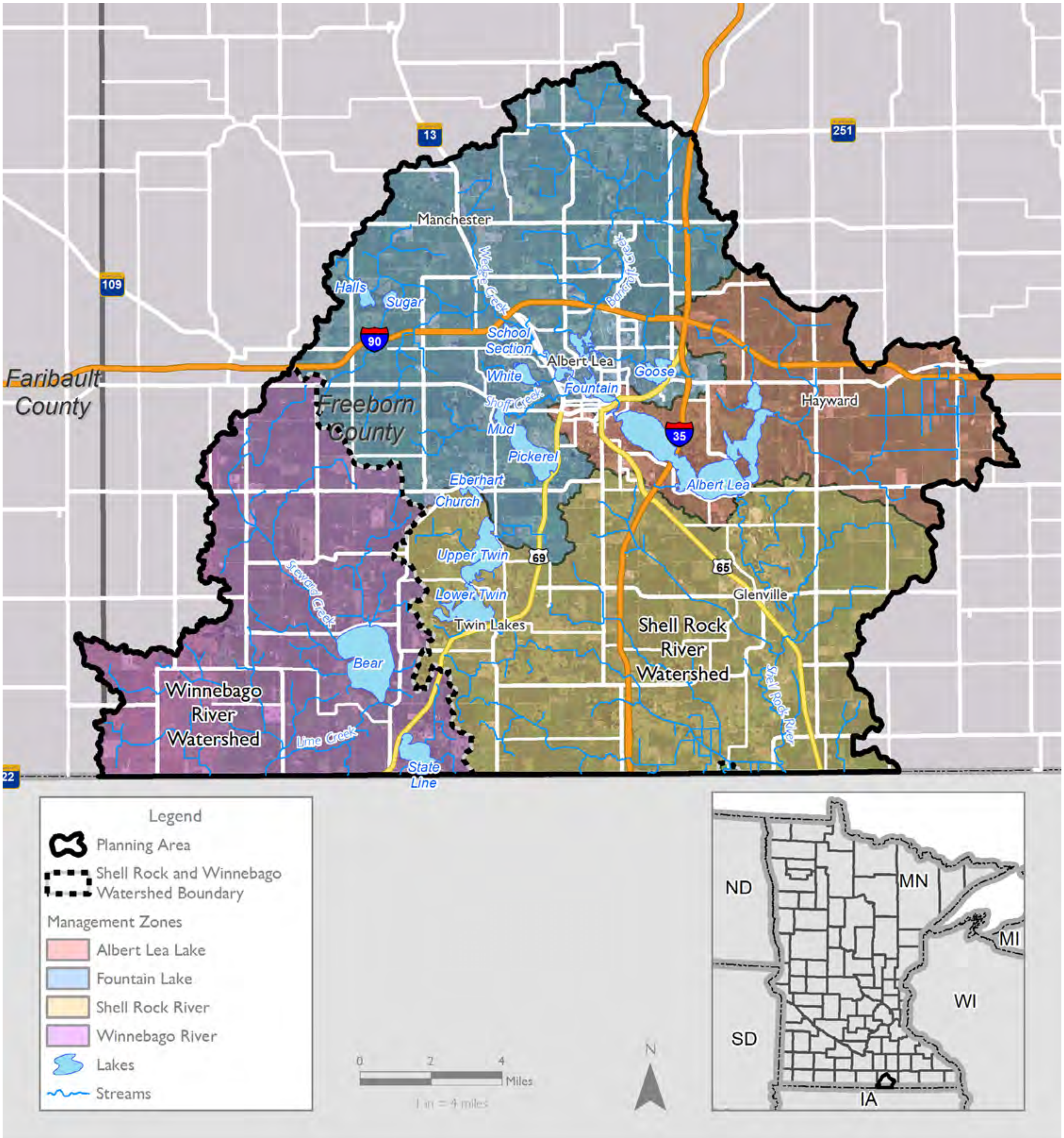


Figure 4-1: Management Zones in the Planning Area

4.1 TARGETING

Prior to establishing the implementation timeline, the Steering Committee worked through an iterative approach that considered staffing capacity and funding, selected implementation actions, priority ranking of management zone, and targeted locations based on cost effectiveness to develop measurable outcomes over the 10-year planning period.

The Steering Committee focused on developing a realistic and achievable plan. As a result, the first step was to determine expected staff capacity and funding. To estimate the annual staffing capacity to implement projects, the annual average acreage was calculated from the last five years of implemented projects. Estimates of expected annual funding was calculated from the last three to five years of each participating entity. Funding sources used in this calculation included base funding and existing long-term grants.

The Steering Committee used expected staffing capacity and funding, selected implementation actions, and priority ranking of each management zone to build a targeted measurable outcome using a spreadsheet targeting tool. The spreadsheet targeting tool was developed for the MPCA by RESPEC for the Shell Rock River and Winnebago River watersheds. The tool is based on the calibrated Hydrologic-Simulation Program – FORTRAN (HSPF) models for these watersheds with additional terrain analysis and calculations to determine pollutant loading from the landscape at a higher resolution [RESPEC, 2020]. The result is a tool that allows users to apply BMPs to a watershed and target areas that contribute the highest pollutant levels to the priority waterbodies. A detailed write-up of the tool's development methodology is included in Appendix G.

Using the spreadsheet targeting tool the Steering Committee applied the selected implementation actions in each management zone to estimate the measurable outcomes for priority resources. Implementation actions were distributed between the management zones based on zone priority ranking with more efforts being allocated to the higher priority Fountain Lake and Albert Lea Lake management zones. To target implementation actions within each management zone, drainage areas were established based on locations of priority resources. These drainage areas are shown in the maps of each management zone in this chapter with each management zone having two or three drainage areas that align with major tributaries in those management zones (Figures 4-3, 4-4, 4-5, and 4-6).

To further refine the targeting of implementation actions within each management zone's drainage area the spreadsheet targeting tool's cost effectiveness metric was used. This metric calculates the estimated pollutant load reduction per acre that a practice treats per dollar spent to install the practice. This metric was used to establish the priority implementation areas by targeting efforts to the areas that will result in the greatest potential to reduce pollutants at the lowest cost. The cost effectiveness maps will be used during implementation to select specific locations to target efforts. The cost effectiveness for each drainage area was combined for the entire planning area which is shown in Figure 4-2. The cost effectiveness values shown in Figure 4-2 are relative to the outlet of each drainage area and are only presented to highlight the outcomes of the spreadsheet tool. For the targeted implementation efforts there are maps for each BMP focusing on each drainage area to provide more detail that will be used to target actions. For instance, when a line in the implementation table identifies restored wetlands in the Bancroft Creek drainage area, the partnership will use the cost effectiveness map for restored wetlands in the Bancroft Creek drainage area to target the most cost effective areas to implement the practice. These maps are provided in Appendix E.

The final measurable outcomes from this targeting approach are aggregated in the implementation tables by drainage area. With this approach the implementation group will have more flexibility to work within each priority management zone to accomplish the plan goals.

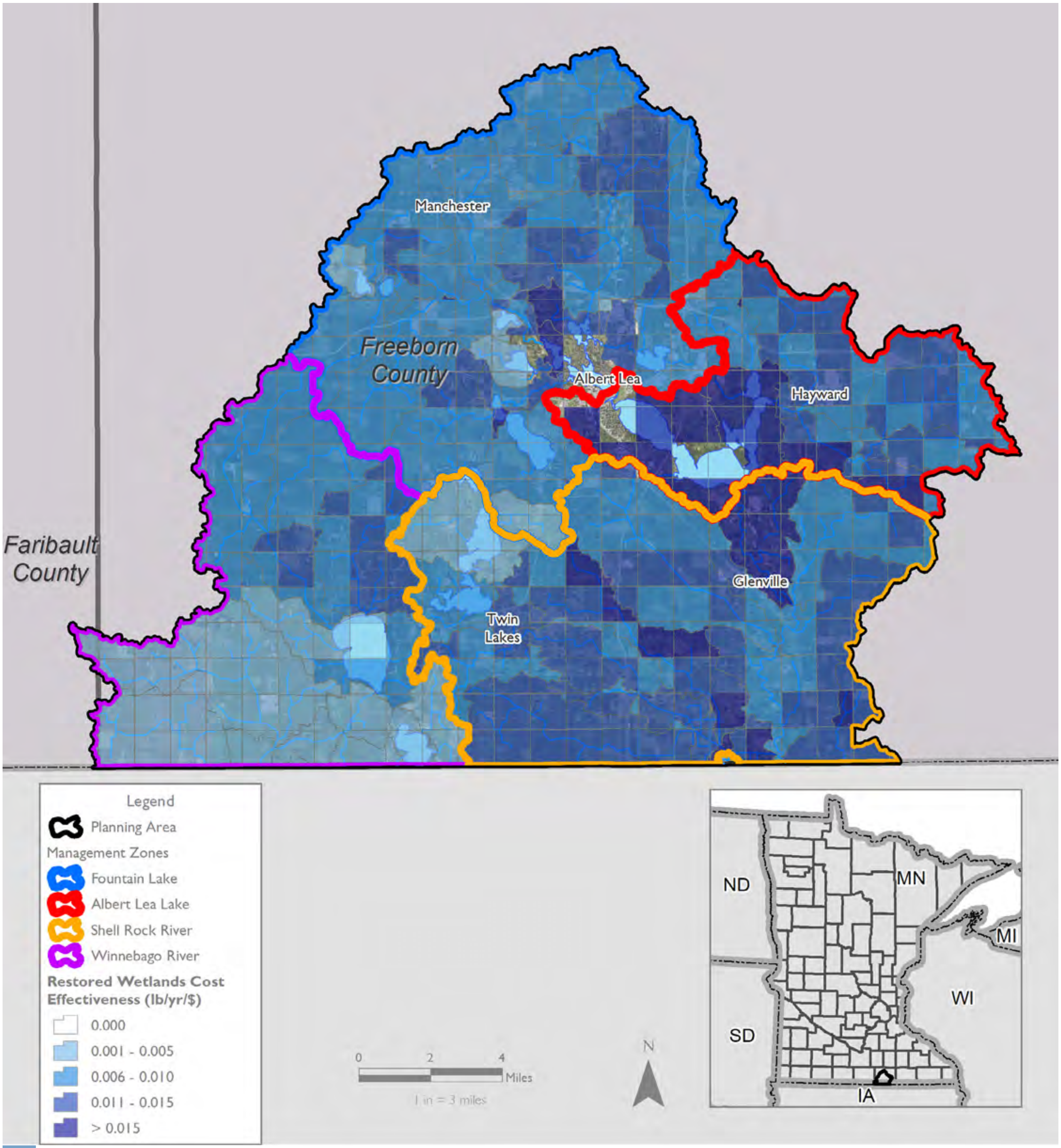


Figure 4-2: Cost Effectiveness Map for Restored Wetlands Treating Phosphorus in the Planning Area

4.2 FUNDING HIERARCHY

While the focus of the Steering Committee was to develop a realistic and achievable plan, there are a number of projects that have been identified in previous studies that address priority issues across the planning area but do not fit within the expected funding levels. To ensure these projects are included in the plan, a funding hierarchy was developed. This hierarchy establishes three funding tiers, A, B and C, that are described below. The funding tiers are independent of the prioritization of issues, resources, and targeted areas and are used to separate implementation actions that are included as a part of the overall plan costs (Tier A) from actions that are dependent on securing additional funds to implement. Implementation actions marked with a funding tier of "N/A" indicate the action is covered within existing efforts of the lead LGU. Actions listed as tier B or C may not include cost estimates but will be determined if actions are pursued as a part of this plan.

4.3 IMPLEMENTATION SCHEDULE

The Plan implementation tables are organized by management zone. The implementation actions are then organized by issue statement within each of the management zone's implementation table. The implementation table details what actions will be implemented, when, by whom, and the estimated costs.

The implementation tables reflect the combination of priority issues and areas in one detailed implementation schedule. The planning team will use the implementation tables to guide their efforts throughout the 10-year planning period and achieve their targeted measurable goals. Implementation actions of highest priority are reflected based on timing and location of efforts. For instance, water quantity is a top priority issue and Fountain Lake drainage area is a top priority management zone, therefore efforts to address water quantity in the Fountain Lake management zone are focused on in early biennium's relative to lower priority issues and areas. To target specific locations for implementation actions the planning team will use the cost effectiveness maps for the drainage area identified in the location column of the implementation tables.

Cost estimates are presented in 2021 value and will be updated to reflect the current costs during the development of the annual workplan. Unless otherwise noted, on-the-ground implementation actions include the costs for project specific technical assistance, design, permitting, easements, landowner contribution, and other direct project related costs.

Table 4-2 presents the total pollutant load reductions at the end of the 10-year planning period as a result of implementing all actions identified in this plan. These reductions were calculated using the spreadsheet targeting tool and reflect load reductions at the edge of field.

Table 4-2: Planned Pollutant Reduction by Management Zone

MANAGEMENT ZONE	TSS LOAD REDUCTION (T/YR)	TN LOAD REDUCTION (LB/YR)	TP LOAD REDUCTION (LB/YR)
Fountain Lake	625	219,972	3,612
Albert Lea Lake	173	84,364	1,305
Shell Rock River	125	60,728	943
Winnebago	90	49,589	685

FUNDING HIERARCHY

TIER A

Priority projects that are the focus of implementation that fit within the expected staffing capacity and funding. Combined, these projects result in the plan's measurable outcomes and final cost.

TIER B

Projects that address priority issues but lack necessary funding to implement. Grants will be actively sought when or if deemed necessary to meet plan goals.

TIER C

Projects identified in previous studies that align with priority issues but lack funding and are cost prohibitive. If momentum increases or additional grants are secured these projects will be implemented.

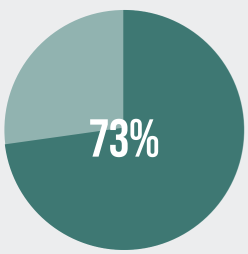
The implementation schedules for each management zone include projects from all funding tiers with a column that denotes which tier they fall under.

FAST FACTS

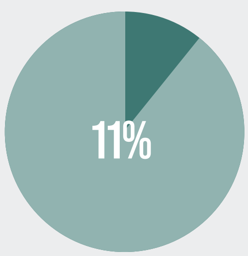
Area
100 mi²
(Rank 1 of 4)

Population (2010 Census)
17,843
(Rank 1 of 4)

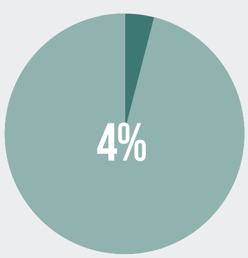
DOMINANT LAND COVER



CULTIVATED CROPS



DEVELOPED LAND



HAY/PASTURE

4.4 FOUNTAIN LAKE

The Fountain Lake management zone is the largest of four management zones in the planning area and covers roughly 100 square-miles (the entire planning area is roughly 316 square-miles). The management area landscape is dominated by cultivated crops (73%) followed by developed (11%) and hay/pasture (4%). The developed area is largely due to portions of this management zone covering areas of Albert Lea (2015 population: 17,843) which is the largest population center in the planning area. In addition to Albert Lea, population centers in the Fountain Lake management zone include Clarks Grove (2015 population: 606) and Manchester (2015 population: 39). The defining water feature in this management zone is Fountain Lake which sits at the heart of Albert Lea and provides numerous recreational and economic benefits to the area. This management zone is divided into three separate drainage areas which make up the three major tributaries to Fountain Lake, Bancroft Creek to the north (43 square-miles), Wedge Creek to the west (39 square-miles), and Shoff Creek to the south (18 square-miles). The landscape of each of these drainage areas are similar with cultivated crops dominating the landscape of each Bancroft Creek (73%), Wedge Creek (75%), and Shoff Creek (67%). The City of Albert Lea extends into all three drainage areas with Bancroft Creek having the largest portion of the city located in it, and Wedge Creek having the highest population. Population totals based on 2010 census data for each drainage area are; Bancroft Creek (4,945), Wedge Creek (5,400), and Shoff Creek (1,829) which makes this management zone the most populated.

FOUNTAIN LAKE

Drainage Areas/Major Tributaries

North	West	South
Bancroft Creek	Wedge Creek	Shoff Creek
43 mi²	39 mi²	18 mi²
73% Cultivated Crops	75% Cultivated Crops	67% Cultivated Crops

KEY FEATURES

The City of Albert Lea

Fountain Lake

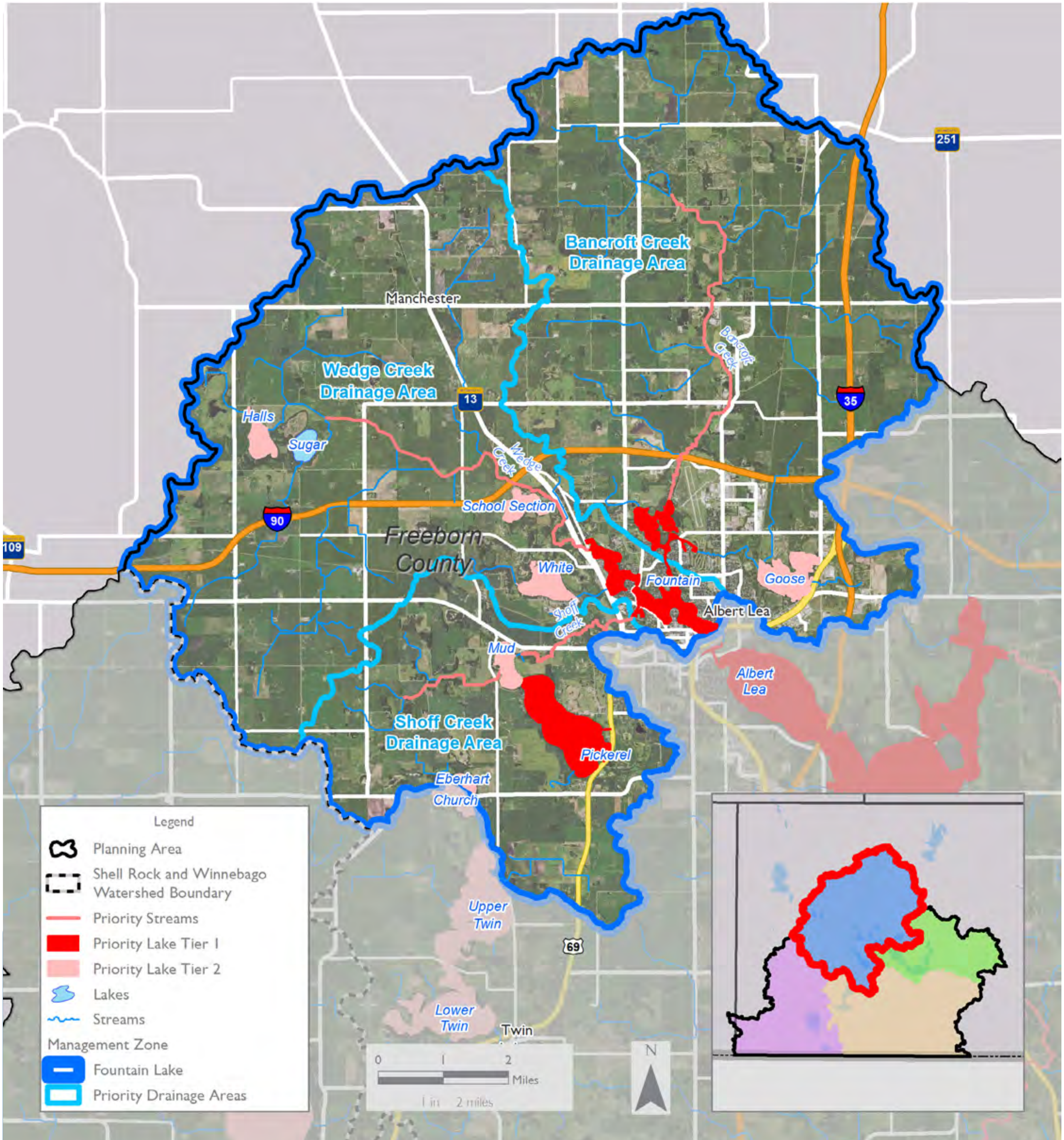


Figure 4-3: Fountain Lake Management Zone

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A1 Surface Water Quantity		
Cover Crops	Wedge Creek Drainage Area	Plant cover crops on 2437 acres of cropland and create 76.7 acre-feet of water storage.
Cover Crops	Bancroft Creek Drainage Area	Plant cover crops on 2631 acres of cropland and create 82.8 acre-feet of water storage.
Cover Crops	Shoff Creek Drainage Area	Plant cover crops on 500 acres of cropland and create 15.7 acre-feet of water storage.
Wetland Restoration	Wedge Creek Drainage Area	Implement 175 acres of restored wetland basins to create 1,296.3 acre-feet of water storage.
Wetland Restoration	Bancroft Creek Drainage Area	Implement 184 acres of restored wetland basins to create 1,357.7 acre-feet of water storage.
Wetland Restoration	Shoff Creek Drainage Area	Implement 32 acres of restored wetland basins to create 532.1 acre-feet of water storage.
Track Flooding	City of Albert Lea	Collect data of locations and duration of flooding in the City of Albert Lea.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	122 acres costing $6,093	609 acres costing $30,463	731 acres costing $36,555	609 acres costing $30,463	366 acres costing $18,278	A	$121,850	$121,850	SRRWD/ SWCD	
	132 acres costing $6,578	658 acres costing $32,888	789 acres costing $39,465	658 acres costing $32,888	395 acres costing $19,733	A	$131,550	$131,550	SRRWD/ SWCD	
	25 acres costing $1,250	125 acres costing $6,250	150 acres costing $7,500	125 acres costing $6,250	75 acres costing $3,750	A	$25,000	$25,000	SRRWD/ SWCD	
	25 acres costing $1,250	44 acres costing $297,160	52 acres costing $445,740	44 acres costing $371,450	26 acres costing $297,160	A	$1,485,800	$1,485,800	SRRWD/ SWCD	
	9 acres costing $78,200	46 acres costing $312,800	55 acres costing $469,200	46 acres costing $391,000	28 acres costing $312,800	A	$1,564,000	$1,564,000	SRRWD/ SWCD	
	2 acres costing $13,685	8 acres costing $54,740	10 acres costing $82,110	8 acres costing $68,425	5 acres costing $54,740	A	$273,700	$273,700	SRRWD/ SWCD	
	$-	$-	$-	$-	$-	N/A	$-	$-	City of Albert Lea	
Subtotal A1	**$180,095**	**$734,300**	**$1,080,570**	**$900,475**	**$706,460**		**$3,601,900**	**$3,601,900**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A2 Surface Water Quality (continued on next page)		
Cover Crops	Wedge Creek Drainage Area	Plant cover crops on 2437 acres of cropland to achieve pollutant reduction of: TP: 146 lbs/yr, TSS: 507 tons/yr, TN: 30189 lbs/yr.
Cover Crops	Bancroft Creek Drainage Area	Plant cover crops on 2631 acres of cropland to achieve pollutant reduction of: TP: 154 lbs/yr, TSS: 572 tons/yr, TN: 34383 lbs/yr.
Cover Crops	Shoff Creek Drainage Area	Plant cover crops on 500 acres of cropland to achieve pollutant reduction of: TP: 63 lbs/yr, TSS: 224 tons/yr, TN: 12340 lbs/yr.
Wetland Restoration	Wedge Creek Drainage Area	Implement 175 acres of restored wetland basins to achieve pollutant reduction of: TP: 622 lbs/yr, TSS: 83 tons/yr, TN: 40710 lbs/yr.
Wetland Restoration	Bancroft Creek Drainage Area	Implement 184 acres of restored wetland basins to achieve pollutant reduction of: TP: 653 lbs/yr, TSS: 83 tons/yr, TN: 43395 lbs/yr.
Wetland Restoration	Shoff Creek Drainage Area	Implement 32 acres of restored wetland basins to achieve pollutant reduction of: TP: 250 lbs/yr, TSS: 31 tons/yr, TN: 16716 lbs/yr.
Grassed Waterway	Wedge Creek Drainage Area	Implement 6 grassed waterways to achieve pollutant reduction of: TP: 77 lbs/yr, TSS: 5 tons/yr, TN: 1656 lbs/yr.
Grassed Waterway	Bancroft Creek Drainage Area	Implement 6 grassed waterways to achieve pollutant reduction of: TP: 105 lbs/yr, TSS: 13 tons/yr, TN: 2207 lbs/yr.
Grassed Waterway	Shoff Creek Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 32 lbs/yr, TSS: 2 tons/yr, TN: 836 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	1 Grassed Waterway/s costing $10,000	2 Grassed Waterway/s costing $20,000	2 Grassed Waterway/s costing $20,000	1 Grassed Waterway/s costing $10,000	0 Grassed Waterway/s costing $0	A	$60,000	$60,000	SRRWD/ SWCD	
	1 Grassed Waterway/s costing $10,000	2 Grassed Waterway/s costing $20,000	2 Grassed Waterway/s costing $20,000	1 Grassed Waterway/s costing $10,000	0 Grassed Waterway/s costing $0	A	$60,000	$60,000	SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	1 Grassed Waterway/s costing $10,000	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	A	$ 10,000	$20,000	SRRWD/ SWCD	

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A2 Surface Water Quality Continued		
WASCOB	Wedge Creek Drainage Area	Implement 3 WASCOBs to achieve pollutant reduction of: TP: 15 lbs/yr, TSS: 1 tons/yr, TN: 573 lbs/yr.
WASCOB	Bancroft Creek Drainage Area	Implement 4 WASCOBs to achieve pollutant reduction of: TP: 15 lbs/yr, TSS: 1 tons/yr, TN: 502 lbs/yr.
WASCOB	Shoff Creek Drainage Area	Implement 4 WASCOBs to achieve pollutant reduction of: TP: 21 lbs/yr, TSS: 2 tons/yr, TN: 689 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Wedge Creek Drainage Area	Plant conservation cover perennials on 384 acres and achieve pollutant reduction of: TP: 229 lbs/yr, TSS: 23 tons/yr, TN: 16381 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Bancroft Creek Drainage Area	Plant conservation cover perennials on 387 acres and achieve pollutant reduction of: TP: 191 lbs/yr, TSS: 12 tons/yr, TN: 13161 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Shoff Creek Drainage Area	Plant conservation cover perennials on 185 acres and achieve pollutant reduction of: TP: 98 lbs/yr, TSS: 7 tons/yr, TN: 6235 lbs/yr.
Lake Dredging	Fountain Lake	Complete dredging of Fountain Lake
Lake Alum Treatment	Fountain Lake West Bay	Conduct alum treatment on Fountain Lake West Bay and achieve pollutant reduction of: TP: 2300 lbs/yr
Lake Alum Treatment	Fountain Lake East Bay	Conduct alum treatment on Fountain Lake East Bay and achieve pollutant reduction of: TP: 3100 lbs/yr.

	TIMELINE									
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	1 WASCOB/s costing $5,000	1 WASCOB/s costing $5,000	1 WASCOB/s costing $5,000	0 WASCOB/s costing $0	0 WASCOB/s costing $0	A	$15,000	$15,000	SRRWD/ SWCD	
	1 WASCOB/s costing $5,000	2 WASCOB/s costing $10,000	1 WASCOB/s costing $5,000	0 WASCOB/s costing $0	0 WASCOB/s costing $0	A	$20,000	$20,000	SRRWD/ SWCD	
	1 WASCOB/s costing $5,000	2 WASCOB/s costing $10,000	1 WASCOB/s costing $5,000	0 WASCOB/s costing $0	0 WASCOB/s costing $0	A	$20,000	$20,000	SRRWD/ SWCD	
	19 acres costing $9,600	96 acres costing $48,000	115 acres costing $57,600	96 acres costing $48,000	58 acres costing $28,800	A	$192,000	$192,000	SRRWD/ SWCD	
	19 acres costing $9,675	97 acres costing $48,375	116 acres costing $58,050	97 acres costing $48,375	58 acres costing $29,025	A	$193,500	$193,500	SRRWD/ SWCD	
	9 acres costing $4,625	46 acres costing $23,125	56 acres costing $27,750	46 acres costing $23,125	28 acres costing $13,875	A	$92,500	$92,500	SRRWD/ SWCD	
	$3,750,000	$3,750,000	$-	$-	$-	A	$7,500,000	$7,500,000	SRRWD	
	$-	$-	$-	$-	$-	C	$-	$329,000	SRRWD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$862,000	SRRWD	MNDNR
Subtotal A2	**$3,808,900**	**$3,944,500**	**$208,400**	**$139,500**	**$71,700**		**$8,173,000**	**$9,364,000**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B1 Erosion and Sediment Control		
Cover Crops	Wedge Creek Drainage Area	Plant cover crops on 2437 acres of cropland to achieve pollutant reduction of: TP: 146 lbs/yr, TSS: 507 tons/yr, TN: 30189 lbs/yr.
Cover Crops	Bancroft Creek Drainage Area	Plant cover crops on 2631 acres of cropland to achieve pollutant reduction of: TP: 154 lbs/yr, TSS: 572 tons/yr, TN: 34383 lbs/yr.
Cover Crops	Shoff Creek Drainage Area	Plant cover crops on 500 acres of cropland to achieve pollutant reduction of: TP: 63 lbs/yr, TSS: 224 tons/yr, TN: 12340 lbs/yr.
Wetland Restoration	Wedge Creek Drainage Area	Implement 9309 acres of restored wetland basins to achieve pollutant reduction of: TP: 622 lbs/yr, TSS: 83 tons/yr, TN: 40710 lbs/yr.
Wetland Restoration	Bancroft Creek Drainage Area	Implement 1716 acres of restored wetland basins to achieve pollutant reduction of: TP: 653 lbs/yr, TSS: 83 tons/yr, TN: 43395 lbs/yr.
Wetland Restoration	Shoff Creek Drainage Area	Implement 1317 acres of restored wetland basins to achieve pollutant reduction of: TP: 250 lbs/yr, TSS: 31 tons/yr, TN: 16716 lbs/yr.
Grassed Waterway	Wedge Creek Drainage Area	Implement 6 grassed waterways to achieve pollutant reduction of: TP: 77 lbs/yr, TSS: 5 tons/yr, TN: 1656 lbs/yr.
Grassed Waterway	Bancroft Creek Drainage Area	Implement 6 grassed waterways to achieve pollutant reduction of: TP: 105 lbs/yr, TSS: 13 tons/yr, TN: 2207 lbs/yr.
Grassed Waterway	Shoff Creek Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 32 lbs/yr, TSS: 2 tons/yr, TN: 836 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B1 Erosion and Sediment Control continued		
WASCOB	Wedge Creek Drainage Area	Implement 3 WASCOBs to achieve pollutant reduction of: TP: 15 lbs/yr, TSS: 1 tons/yr, TN: 573 lbs/yr.
WASCOB	Bancroft Creek Drainage Area	Implement 4 WASCOBs to achieve pollutant reduction of: TP: 15 lbs/yr, TSS: 1 tons/yr, TN: 502 lbs/yr
WASCOB	Shoff Creek Drainage Area	Implement 4 WASCOBs to achieve pollutant reduction of: TP: 21 lbs/yr, TSS: 2 tons/yr, TN: 689 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Wedge Creek Drainage Area	Plant conservation cover perennials on 384 acres and achieve pollutant reduction of: TP: 229 lbs/yr, TSS: 23 tons/yr, TN: 16381 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Bancroft Creek Drainage Area	Plant conservation cover perennials on 387 acres and achieve pollutant reduction of: TP: 191 lbs/yr, TSS: 12 tons/yr, TN: 13161 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Shoff Creek Drainage Area	Plant conservation cover perennials on 185 acres and achieve pollutant reduction of: TP: 98 lbs/yr, TSS: 7 tons/yr, TN: 6235 lbs/yr.
Replace Street Sweeper Units	City of Albert Lea	Replace 2 street sweeper units.
Restore/Stabilize Eroding and Failing Streambanks	Shoff Creek	Restore 1400 linear feet of failing streambank.
Restore/Stabilize Eroding and Failing Streambanks	Bancroft Creek	Restore 8000 linear feet of failing streambank.
Restore/Stabilize Eroding and Failing Streambanks	Fountain Lake Outlet to Main St Bridge	Restore/Rehab streambanks from lake outlet to Main Street bridge.

TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
$-	$-	$-	$-	$-	C	$-	$480,000	City of Albert Lea	
$-	$-	$-	$50,000	$-	A	$50,000	$50,000	SRRWD	MNDNR
$-	$-	$-	$200,000	$-	A	$200,000	$200,000	SRRWD	MNDNR
$-	$-	$-	$-	$-	C	$-	$750,000	City of Albert Lea/ SRRWD	MNDNR

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B1 Erosion and Sediment Control continued		
Retention Pond	Front Street Retention Pond	Install Retention Pond Near Plainview Ave and 4th Street.
Rain Garden	Fairway Park Rain Garden	Construct rain garden in the Fairway Park area.
Water Quality Treatment Pond	Pickerel Lake Drainage Area (Model Subwater-shed 82)	Install Water quality treatment pond in the Pickerel Lake drainage area.
Rain Gardens	White Lake Drainage Area (Model Subwater-shed 72)	Install Rain gardens in the White Lake Immediate drainage area
Water Quality Treatment Ponds	Fountain Lake West Bay Drainage Area (Model Subwatershed 80)	Install Water quality treatment pond in the Fountain Lake West Bay immediate drainage area.
Rain Gardens	Fountain Lake West Bay Drainage Area (Model Subwatershed 80)	Install rain gardens in the Fountain Lake West Bay Immediate drainage area.
Water Quality Treatment Ponds	Fountain Lake East Bay Drainage Area (Model Subwatershed 101)	Install Water quality treatment pond in the Goose Creek drainage area.
Water Quality Treatment Ponds	Fountain Lake East Bay Drainage Area (Model Subwatershed 102)	Install Water quality treatment pond in the Fountain Lake North Bay immediate drainage area.
Water Quality Treatment Ponds	Fountain Lake East Bay Drainage Area (Model Subwatershed 120)	Install Water quality treatment pond in the Fountain Lake East Bay immediate drainage area.
Rain Gardens	Fountain Lake East Bay Drainage Area (Model Subwatershed 120)	Install rain gardens in Fountain Lake East Bay immediate drainage area.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	$-	$-	$-	$-	$-	C	$-	$300,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$50,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$564,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$26,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$598,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$19,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$655,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$1,047,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$1,331,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$67,000	City of Albert Lea	
Subtotal B1	**$-**	**$-**	**$-**	**$250,000**	**$-**		**$250,000**	**$6,137,000**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B2 Protect Soil Health		
Expand Acres Implementing Soil Health Practices	Wedge Creek Drainage Area	Plant Cover Crops to create 2212 acres of newly implemented soil health practices.
Expand Acres Implementing Soil Health Practices	Bancroft Creek Drainage Area	Plant Cover Crops to create 2405 acres of newly implemented soil health practices.
Expand Acres Implementing Soil Health Practices	Shoff Creek Drainage Area	Plant Cover Crops to create 951 acres of newly implemented soil health practices.
C1 Protect Sites of High Ecological Value		
Enhance Critical Habitat Areas	Highly Critical Habitat Areas	Enhance 260 acres of highly critical habitat area.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Target working lands adjacent to highly critical habitat areas.	Expand protected land area adjacent to critical habitat areas.
C2 Restore Wetland and Upland Habitat		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Fountain Lake Management Area	Establish 956 acres of perennial vegetation.
Wetland Restoration	Fountain Lake Management Area	Establish 391 acres of upland area to restored wetlands.
Wetland Habitat Restoration	Wedge Creek Drainage Area	Restore 75 acres of wetland habitat.
Wetland Habitat Restoration	Wedge Creek Drainage Area	Restore 20 acres of wetland habitat.
Wetland Habitat Restoration	Wedge Creek Drainage Area	Restore 80 acres of wetland habitat.
Wetland Habitat Restoration	Bancroft Creek Drainage Area	Restore 50 acres of wetland habitat.
Restore Upland Habitat	Pickerel Lake Drainage Area	Restore 57 acres of upland habitat.
Upland and Wetland Habitat Restoration	Shoff Creek Drainage Area	Restore 218 acres of upland and wet-land habitat.
Upland and Wetland Habitat Restoration	Bancroft Creek Drainage Area	Restore 112 acres of upland and wet-land habitat.

	TIMELINE									
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
Subtotal B2										
	$2,600	$2,600	$2,600	$2,600	$2,600	A	$13,000	$13,000	SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal C1	**$2,600**	**$2,600**	**$2,600**	**$2,600**	**$2,600**		**$13,000**	**$13,000**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	$201,250	$-	$-	$-	$-	A	$201,250	$201,250	SRRWD	
	$225,625	$-	$-	$-	$-	A	$225,625	$225,625	SRRWD	
	$371,250	$-	$-	$-	$-	A	$371,250	$371,250	SRRWD	
	$-	$365,000	$-	$-	$-	A	$365,000	$365,000	SRRWD	
	$456,025	$-	$-	$-	$-	A	$456,025	$456,025	SRRWD	
	$1,126,000	$-	$-	$-	$-	A	$1,126,000	$1,126,000	SRRWD	
	$857,900	$-	$-	$-	$-	A	$857,900	$857,900	SRRWD	
Subtotal C2	**$3,238,050**	**$365,000**	**$-**	**$-**	**$-**		**$3,603,050**	**$3,603,050**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
D1 Improve Degraded Aquatic Habitat		
Outreach and Education	Lakeshore Property Owners	Provide information to lakeshore land-owners about lakeshore management including "Score your Shore".
Lake Dredging	Fountain Lake	Complete dredging of Fountain Lake.
Lake Level Drawdown	Pickerel Lake	Conduct a lake level drawdown if deemed necessary later in Plan 10-year period.
Restore Native Aquatic Vegetation	Lakes and Wetlands being restored	Increase seeding and planting of native vegetation during restoration activities.
Restore/Stabilize Eroding and Failing Streambanks	Shoff Creek	Restore 1400 linear feet of failing streambank.
Restore/Stabilize Eroding and Failing Streambanks	Bancroft Creek	Restore 8000 linear feet of failing streambank.
Restore/Stabilize Eroding and Failing Lakeshore	Fountain Lake along Lakeshore Dr.	Restore shoreline and place erosion prevention.
Restore/Stabilize Eroding and Failing Streambanks	Fountain Lake Outlet to Main St Bridge	Restore/Rehab streambanks from lake outlet to Main Street bridge.
Restore/Stabilize Eroding and Failing Streambanks	Locations Identified in Failing Streambank Inventory	Restore failing streambanks identified in the inventory assessment.
Manage Carp Populations	Lakes with Carp Populations	Manage carp so they do not exceed 100 kg/hectare.
Fish Community Reclamation/Rotenone	White Lake (Model Subwatershed 72)	Conduct fish community reclamation to remove carp, reducing TP by 110 lbs/yr.
Fish Community Reclamation/Rotenone	School Section Lake (Model Subwatershed 32)	Conduct fish community reclamation to remove carp, reducing TP by 50 lbs/yr.
Fish Community Reclamation/Rotenone	Goose Lake (Model Subwatershed 99)	Conduct fish community reclamation to remove carp, reducing TP by 330 lbs/yr.

	TIMELINE									
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	$500	$500	$500	$500	$500	A	$2,500	$2,500	SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD	
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD/ SWCD	
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$-	SRRWD	MNDNR
	$-	$-	$-	$-	$-	B	$-	$154,000.00	SRRWD	MNDNR
	$-	$-	$-	$-	$-	B	$-	$142,000.00	SRRWD	MNDNR
	$-	$-	$-	$-	$-	B	$-	$142,000.00	SRRWD	MNDNR
Subtotal D1	**$500**	**$500**	**$500**	**$500**	**$500**		**$2,500**	**$440,500**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
D2 Invasive Species		
Manage Carp Populations	Lakes with Carp Populations	Manage Carp so they do not exceed 100 kg/hectare.
Watercraft Inspections	Fountain Lake	Maintain existing level of aquatic invasive watercraft inspections.
Develop Early Detection and Rapid Response Plan	Fountain Lake	Develop an early detection and rapid response plan to minimize impacts of possible aquatic invasive species infestations to Fountain Lake.
Pump Drawdown Macrophyte Management	Pickerel Lake (Model Subwatershed 82)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	Pickerel Lake (Model Subwatershed 82)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.
Pump Drawdown Macrophyte Management	White Lake (Model Subwatershed 72)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	White Lake (Model Subwatershed 72)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.
Pump Drawdown Macrophyte Management	School Section Lake (Model Subwatershed 32)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	School Section Lake (Model Subwatershed 32)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.
Pump Drawdown Macrophyte Management	Fountain Lake West Bay (Model Subwatershed 80)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	Fountain Lake West Bay (Model Subwatershed 80)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.
Pump Drawdown Macrophyte Management	Goose Lake (Model Subwatershed 99)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	Goose Lake (Model Subwatershed 99)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.
Pump Drawdown Macrophyte Management	Fountain Lake East Bay (Model Subwatershed 120)	Conduct pumped drawdown for macrophyte management to treat curly-leaf pondweed infestation.
Herbicide Macrophyte Management	Fountain Lake East Bay (Model Subwatershed 120)	Conduct herbicide macrophyte management to treat curly-leaf pondweed infestation.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "D1 Improve Degraded Aquatic Habitat"								SRRWD	MNDNR
	$10,000	$10,000	$10,000	$10,000	$10,000	A	$50,000	$50,000	County	
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD	
	$-	$-	$-	$-	$-	C	$-	$430,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$816,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$91,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$280,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$47,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$208,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$137,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$166,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$47,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$208,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$190,000.00	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$437,000.00	SRRWD/ SWCD	MNDNR
Subtotal D2	**$10,000**	**$10,000**	**$10,000**	**$10,000**	**$10,000**		**$50,000**	**$3,107,000**		

Table 4-3: Fountain Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
E1 Groundwater Protection		
Cover Crops	Priority Locations to protect highly vulnerable aquifers.	Plant cover crops on 335 acres.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Priority Locations to protect highly vulnerable aquifers.	Plant perennial vegetation on 56 acres.
Fountain Lake Management Area Total		

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal E1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$7,240,145	**$5,056,900**	**$1,302,070**	**$1,303,075**	**$791,260**		**$15,693,450**	**$26,266,450**		

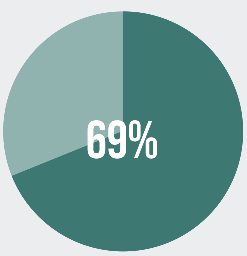
FAST FACTS

Area
50 mi^2
(Rank 4 of 4)

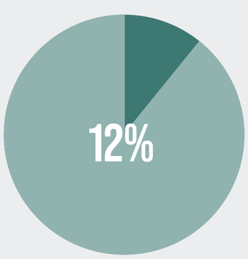
Open Water Space
Albert Lea Lake (4.2 mi^2)
Maximum depth: 5.5 ft.
Average depth: 3.5 ft.

Population (2010 Census)
8,462
(Rank 2 of 4)

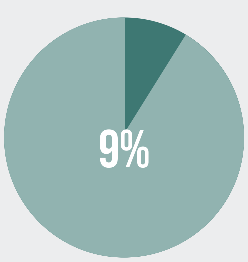
DOMINANT LAND COVER



CULTIVATED CROPS



DEVELOPED LAND



OPEN WATER

4.5 ALBERT LEA LAKE

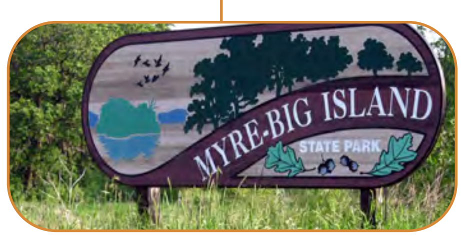
The Albert Lea Lake management zone is the smallest of four management zone in the planning area and covers roughly 50 square-miles. The management area landscape is dominated by cultivated crops (69%) followed by developed (12%) and open water (9%). Developed area in this watershed is largely attributed to Albert Lea, with Hayward (2015 population: 269) being the only other population center located in the Albert Lea Lake management zone. The large amount of open water space is attributed to Albert Lea Lake (4.2 square-miles). Albert Lea Lake is a shallow lake with a maximum depth of 5.5 feet and average depth of 3.5 feet It is known historically for being a wildlife hub with travelers coming for across the United States to hunt and fish the waters. With travelers coming from as far as New York, it received the name New York Point. Currently, it is known for providing recreational opportunities with Myre-Big Island State Park located on its north shore. The Albert Lea Lake management zone is divided into two drainage areas with the one being the major tributary, Peter Lund Creek (29 square-miles), to the east and the immediate Albert Lea Lake lakeshed and north tributary being the second (21 square-miles). The landscape varies greatly between these two drainage areas with Peter Lund Creek largely cultivated crops (91%) and Albert Lea Lake with more of a variety with cultivated crops (40%), open water (21%), and developed (19%). The City of Albert Lea makes up a majority of the landscape in the eastern portion of the Albert Lea Lake lakeshed. Population totals based on 2010 census data for each drainage area are; Peter Lund Creek (564) and Albert Lea Lake (7,898) which makes this management area the second most populated.

ALBERT LEA LAKE

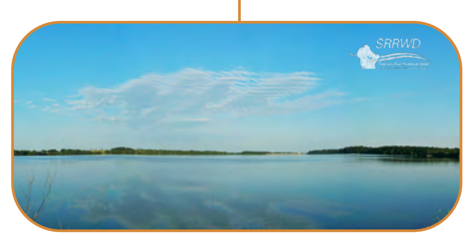
Drainage Areas/Major Tributaries

East	West
Peter Lund Creek	Albert Lea Lake Lakeshed
29 mi^2	21 mi^2
91% Cultivated Crops	40% Cultivated Crops 21% Open Water 19% Developed Land

KEY FEATURES



Myre-Big Island State Park


Albert Lea Lake

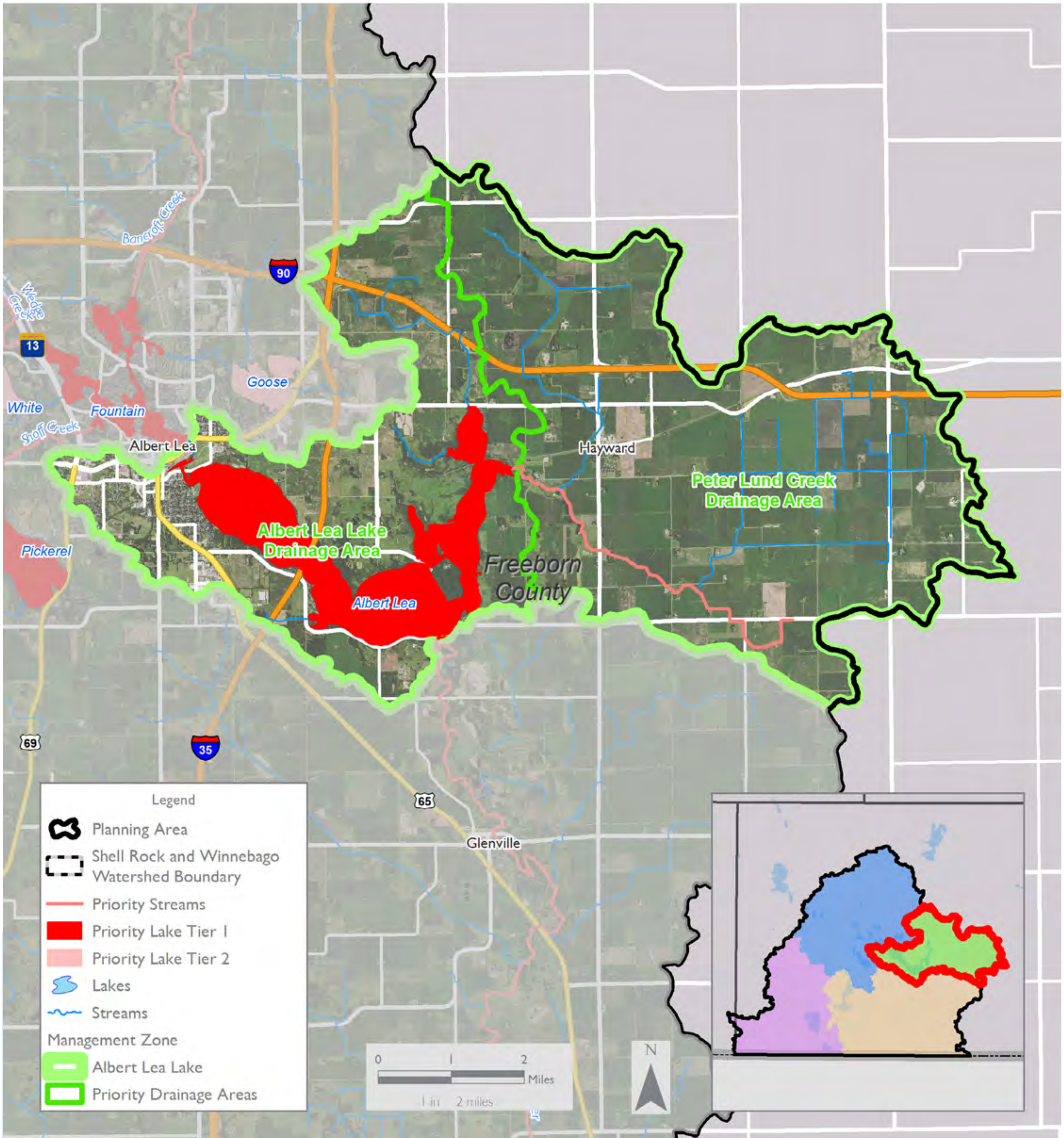


Figure 4-4: Albert Lea Lake Management Zone

Table 4-4: Albert Lea Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A1 Surface Water Quantity		
Cover Crops	Peter Lund Creek Drainage Area	Plant cover crops on 1959 acres of cropland and create 6.7 acre-feet of water storage.
Cover Crops	Albert Lea Lake Drainage Area	Plant cover crops on 161 acres of cropland and create 5.0 acre-feet of water storage.
Wetland Restoration	Peter Lund Creek Drainage Area	Implement 147 acres of restored wetland basins to create 925.7 acre-feet of water storage.
Wetland Restoration	Albert Lea Lake Drainage Area	Implement 9 acres of restored wetland basins to create 101.0 acre-feet of water storage.
Track Flooding	City of Albert Lea	Collect data of locations and duration of flooding in the City of Albert Lea.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	98 acres costing $4,898	490 acres costing $24,488	588 acres costing $29,385	490 acres costing $24,488	294 acres costing $14,693	A	$97,950	$97,950	SRRWD/ SWCD	
	8 acres costing $403	40 acres costing $2,013	48 acres costing $2,415	40 acres costing $2,013	24 acres costing $1,208	A	$8,050	$8,050	SRRWD/ SWCD	
	7 acres costing $78,200	37 acres costing $312,800	44 acres costing $391,000	37 acres costing $312,800	22 acres costing $195,500	A	$1,290,300	$1,251,200	SRRWD/ SWCD	
	0 acres costing $0	2 acres costing $39,100	3 acres costing $39,100	2 acres costing $39,100	1 acres costing $0	A	$117,300	78,200$	SRRWD/ SWCD	
	$-	$-	$-	$-	$-	N/A	$-	$-	City of Albert Lea	
Subtotal A1	**$83,500**	**$378,400**	**$461,900**	**$378,400**	**$211,400**		**$1,513,600**	**$1,435,400**		

Table 4-4: Albert Lea Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A2 Surface Water Quality		
Cover Crops	Peter Lund Creek Drainage Area	Plant cover crops on 1959 acres of cropland to achieve pollutant reduction of: TP: 437 lbs/yr, TSS: 90 tons/yr, TN: 27950 lbs/yr.
Cover Crops	Albert Lea Lake Drainage Area	Plant cover crops on 161 acres of cropland to achieve pollutant reduction of: TP: 38 lbs/yr, TSS: 9 tons/yr, TN: 2420 lbs/yr.
Wetland Restoration	Peter Lund Creek Drainage Area	Implement 147 acres of restored wetland basins to achieve pollutant reduction of: TP: 514 lbs/yr, TSS: 47 tons/yr, TN: 35111 lbs/yr.
Wetland Restoration	Albert Lea Lake Drainage Area	Implement 9 acres of restored wetland basins to achieve pollutant reduction of: TP: 41 lbs/yr, TSS: 6 tons/yr, TN: 2435 lbs/yr.
Grassed Waterway	Peter Lund Creek Drainage Area	Implement 5 grassed waterways to achieve pollutant reduction of: TP: 56 lbs/yr, TSS: 3 tons/yr, TN: 1223 lbs/yr.
WASCOB	Peter Lund Creek Drainage Area	Implement 3 WASCOBs to achieve pollutant reduction of: TP: 17 lbs/yr, TSS: 4 tons/yr, TN: 566 lbs/yr.
Conservation C over Perennials (convert working lands to perennial vegetation)	Peter Lund Creek Drainage Area	Plant conservation cover perennials on 336 acres and achieve pollutant reduction of: TP: 183 lbs/yr, TSS: 12 tons/yr, TN: 13644 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Albert Lea Lake Drainage Area	Plant conservation cover perennials on 28 acres and achieve pollutant reduction of: TP: 13 lbs/yr, TSS: 1 tons/yr, TN: 906 lbs/yr.
Lake Dredging	Albert Lea Lake	Dredge Albert Lea Lake.
B1 Erosion and Sediment Control		
Cover Crops	Peter Lund Creek Drainage Area	Plant cover crops on 1959 acres of cropland to achieve pollutant reduction of: TP: 437 lbs/yr, TSS: 90 tons/yr, TN: 27950 lbs/yr.
Cover Crops	Albert Lea Lake Drainage Area	Plant cover crops on 161 acres of cropland to achieve pollutant reduction of: TP: 38 lbs/yr, TSS: 9 tons/yr, TN: 2420 lbs/yr.
Wetland Restoration	Peter Lund Creek Drainage Area	Implement 563 acres of restored wetland basins to achieve pollutant reduction of: TP: 514 lbs/yr, TSS: 47 tons/yr, TN: 35111 lbs/yr.
Wetland Restoration	Albert Lea Lake Drainage Area	Implement 1090 acres of restored wetland basins to achieve pollutant reduction of: TP: 41 lbs/yr, TSS: 6 tons/yr, TN: 2435 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	2 Grassed Waterway/s costing $20,000	1 Grassed Waterway/s costing $10,000	0 Grassed Waterway/s costing $0	A	$40,000	$50,000	SRRWD/ SWCD	
	0 WASCOB/s costing $0	1 WASCOB/s costing $5,000	1 WASCOB/s costing $5,000	1 WASCOB/s costing $5,000	0 WASCOB/s costing $0	A	$15,000	$15,000	SRRWD/ SWCD	
	17 acres costing $8,400	84 acres costing $42,000	101 acres costing $50,400	84 acres costing $42,000	50 acres costing $25,200	A	$168,000	$168,000	SRRWD/ SWCD	
	0 acres costing $0	11 acres costing $4,900	8 acres costing $4,200	7 acres costing $3,500	4 acres costing $2,100	A	$14,700	$14,000	SRRWD/ SWCD	
	$-	$-	$-	$-	$-	C	$-	$35,000,000	SRRWD	
Subtotal A2	**$8,400**	**$61,900**	**$79,600**	**$60,500**	**$27,300**		**$237,700**	**$35,247,000**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	

Table 4-4: Albert Lea Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
Grassed Waterway	Peter Lund Creek Drainage Area	Implement 5 grassed waterways to achieve pollutant reduction of: TP: 56 lbs/yr, TSS: 3 tons/yr, TN: 1223 lbs/yr.
WASCOB	Peter Lund Creek Drainage Area	Implement 3 WASCOBs to achieve pollutant reduction of: TP: 17 lbs/yr, TSS: 4 tons/yr, TN: 566 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Peter Lund Creek Drainage Area	Plant conservation cover perennials on 336 acres and achieve pollutant reduction of: TP: 183 lbs/yr, TSS: 12 tons/yr, TN: 13644 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Albert Lea Lake Drainage Area	Plant conservation cover perennials on 28 acres and achieve pollutant reduction of: TP: 13 lbs/yr, TSS: 1 tons/yr, TN: 906 lbs/yr.
Replace Street Sweeper Units	City of Albert Lea	Replace 2 street sweeper units.
Stormwater Ponds	Old Godfathers	Construct 2 stormwater ponds along East Main Street.
Stormwater Ponds	East Main/Co Rd 38	Construct stormwater pond if needed pending results of study.
Retention Pond	19 St Retention Pond	Install retention pond near Meyers Road and 19th Street.
Rain Garden	Academy Park Rain Garden	Construct 2 rain gardens in the Academy Park area.
Channel Restoration	Banks around Canadian Pacific Railroad Bridge upstream of Albert Lea Lake inlet	Restore or rehab streambanks around the Canadian Pacific Railroad bridge.
Dredge Channel	Channel near E. Pearl Street and Elizabeth Avenue upstream of Albert Lea Lake inlet	Dredge channel upstream of Albert Lea Lake inlet.
Lakeshore Restoration	Albert Lea Lake	Restore 400 ft of failing lakeshore on Albert Lea Lake.
Water Quality Treatment Pond	Albert Lea Lake Drainage Area (Model Subwatershed 140)	Install water quality treatment pond in the Albert Lea Lake drainage area.

**Scope and cost of project is unknown at time of planning but will be updated in work plan following completion of study*

	TIMELINE Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under Fountain Lake Management Area's "A1 Surface Water Quantity"								City of Albert Lea	
	$2,600,000	$-	$-	$-	$-	A	$2,600,000	$2,600,000	City of Albert Lea	
	$-	$-	$-	$-	$-	A	$-	TBD*	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$130,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$30,000	City of Albert Lea/ SRRWD	
	$-	$-	$-	$-	$-	C	$-	$1,340,000	City of Albert Lea	
	$-	$-	$-	$-	$-	C	$-	$500,000	City of Albert Lea	MNDNR
	$-	$-	$-	$100,000	$100,000	A	$200,000	$200,000	SRRWD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$173,000	City of Albert Lea	
Subtotal B1	**$2,600,000**	**$-**	**$-**	**$100,000**	**$100,000**		**$2,800,000**	**$4,973,000**		

Table 4-4: Albert Lea Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B2 Protect Soil Health		
Expand Acres Implementing Soil Health Practices	Peter Lund Creek Drainage Area	Plant Cover Crops to create 1959 acres of newly implemented soil health practices.
Expand Acres Implementing Soil Health Practices	Albert Lea Lake Drainage Area	Plant Cover Crops to create 161 acres of newly implemented soil health practices.
C1 Protect Sites of High Ecological Value		
Enhance Critical Habitat Areas	Highly Critical Habitat Areas	Enhance 208 acres of highly critical habitat area.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Target working lands adjacent to highly critical habitat areas.	Expand protected land area adjacent to critical habitat areas.
C2 Restore Wetland and Upland Habitat		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Albert Lea Lake Management Area	Establish 365 acres of perennial vegetation.
Wetland Restoration	Albert Lea Lake Management Area	Establish 156 acres of upland area to restored wetlands.
D1 Improve Degraded Aquatic Habitat		
Outreach and Education	Lakeshore Property Owners	Provide information to lakeshore landowners about lakeshore management including "Score your Shore".
Lake Dredging	Albert Lea Lake	Dredge Albert Lea Lake.
In-Lake Habitat Improvements	Albert Lea Lake	Create in-lake and shoreline habitat structures for improved fisheries habitat in Albert Lea Lake.
Lake Level Drawdown	Albert Lea Lake	Conduct a lake level drawdown if deemed necessary later in Plan 10-year period.
Manage Carp Populations	Albert Lea Lake	Conduct fish community reclamation to remove carp, reducing TP by 5010 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
Subtotal B2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$-	$-	$2,100	$4,200	$4,200	B	$10,500	$10,500	SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal C1	**$-**	**$-**	**$2,100**	**$4,200**	**$4,200**		**$10,500**	**$10,500**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
Subtotal C2	$-	$-	$-	$-	$-		$-	$-		
	$100	$100	$100	$100	$100	A	$500	$500	SRRWD/ SWCD	MNDNR
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	$-	$-	$-	$-	$-	B	$-	$200,000	SRRWD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$-	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	C	$-	$481,000	SRRWD	MNDNR
Subtotal D1	**$100**	**$100**	**$100**	**$100**	**$100**		**$500**	**$681,500**		

Table 4-4: Albert Lea Lake Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
D2 Invasive Species		
Manage Carp Populations	Lakes with Carp Populations	Manage Carp so they do not exceed 100 kg/hectare.
E1 Groundwater Protection		
Cover Crops	Priority Locations to protect highly vulnerable aquifers.	Plant cover crops on 261 acres.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Priority Locations to protect highly vulnerable aquifers.	Plant perennial vegetation on 44 acres.
Albert Lea Lake Management Area Total		

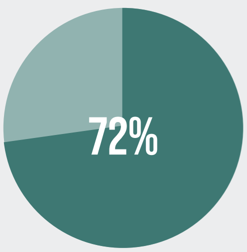
	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under "D1 Improve Degraded Aquatic Habitat"								SRRWD	MNDNR
Subtotal D2	$-	$-	$-	$-	$-		$-	$-		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal E1	$-	$-	$-	$-	$-		$-	$-		
	$2,692,000	$440,400	$543,700	$543,200	$343,000		$4,562,300	$42,347,400		

FAST FACTS

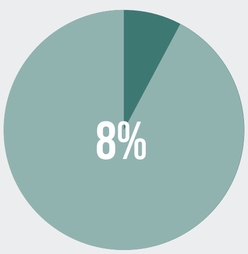
Area
96 mi²
(Rank 2 of 4)

Population (2010 Census)
2,741
(Rank 3 of 4)

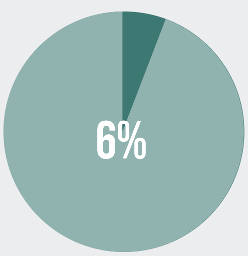
DOMINANT LAND COVER



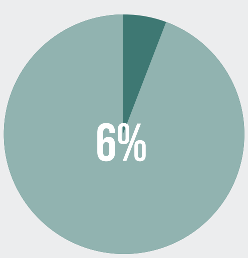
CULTIVATED CROPS



WETLANDS



DEVELOPED LAND



HAY/PASTURE

4.6 SHELL ROCK RIVER OUTLET

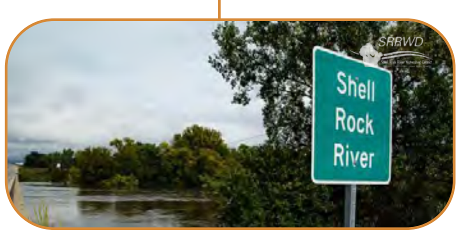
The Shell Rock River Outlet management zone covers all of the area that drains to the Shell Rock River downstream of Albert Lea Lake and is the second largest management zone in the SRWRW (96 square-miles). The management area landscape is dominated by cultivated crops (72%), followed by wetlands (8%), hay/pasture (6%), and developed (6%). Population centers include the southern most extents of Albert Lea, Glenville (2015 population: 586), Gordonsville Township (population unknown), and Twin Lakes (2015 population: 176). Water features of importance in this management zone include Upper and Lower Twin Lakes and Shell Rock River. Upper and Lower Twin Lakes are shallow lakes (maximum depth of 2.5 feet for both) and provide native habitat for waterfowl. These lakes do not allow motorized boats and drain to Goose Creek which flows to its confluence with the Shell Rock River near the Iowa border. The Shell Rock River in this management zone flows from the outlet of Albert Lea Lake, through Glenville, and to the Iowa border and is the outlet of the Shell Rock River Watershed. This management zone is divided into two drainage areas, the Shell Rock River (48 square-miles) and Twin Lakes/Goose Creek (48 square-miles) drainage areas. The landcover is similar in both drainage areas with Shell Rock River mostly cultivated crops (80%) followed by developed (7%), and wetlands (5%), and Twin Lakes/Goose Creek mostly cultivated crops (65%) followed by wetlands (11%), and hay/pasture (8%). Population totals based on 2010 census data for each drainage area are: Shell Rock River (2,042) and Twin Lakes/Goose Creek (699) making it the third most populated management zone.

SHELL ROCK RIVER OUTLET

Drainage Areas/Major Tributaries

East	West
Shell Rock River	Twin Lakes/Goose Creek
48 mi²	48 mi²
80% Cultivated Crops 7% Developed Land 5% Wetlands	65% Cultivated Crops 11% Wetlands 8% Hay/Pasture

KEY FEATURES



Shell Rock River

Upper and Lower Twin Lakes

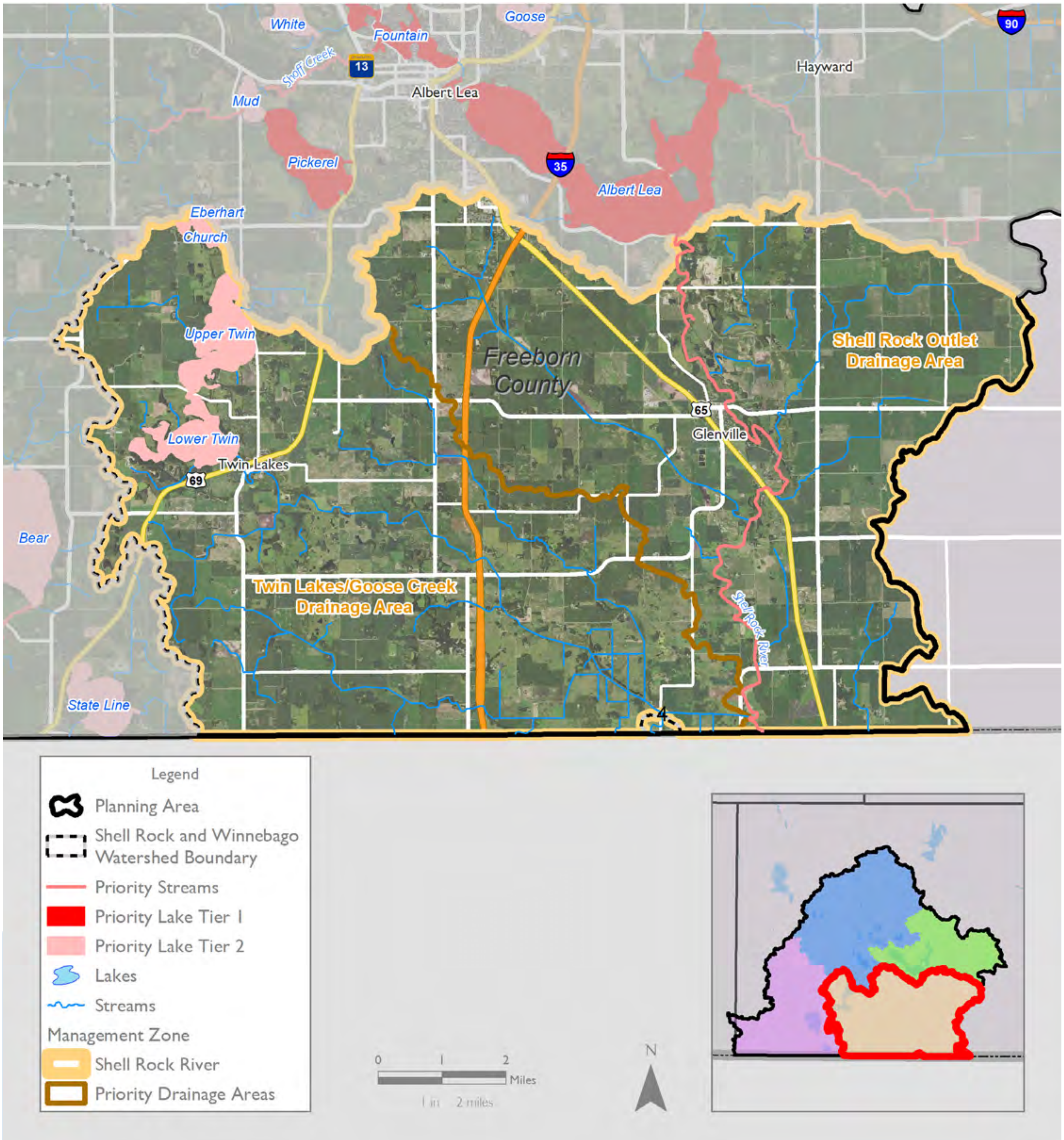


Figure 4-5: Shell Rock River Outlet Management Zone

Table 4-5: Shell Rock River Outlet Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A1 Surface Water Quantity		
Cover Crops	Twin Lakes/Goose Creek Drainage Area	Plant cover crops on 550 acres of cropland and create 12.2 acre-feet of water storage.
Cover Crops	Shell Rock River Outlet Drainage Area	Plant cover crops on 790 acres of cropland and create 17.6 acre-feet of water storage.
Wetland Restoration	Twin Lakes/Goose Creek Drainage Area	Implement 46 acres of restored wetland basins to create 636.8 acre-feet of water storage.
Wetland Restoration	Shell Rock River Outlet Drainage Area	Implement 55 acres of restored wetland basins to create 742.2 acre-feet of water storage.
A2 Surface Water Quality		
Cover Crops	Twin Lakes/Goose Creek Drainage Area	Plant cover crops on 550 acres of cropland to achieve pollutant reduction of: TP: 142 lbs/yr, TSS: 34 tons/yr, TN: 8768 lbs/yr.
Cover Crops	Shell Rock River Outlet Drainage Area	Plant cover crops on 790 acres of cropland to achieve pollutant reduction of: TP: 184 lbs/yr, TSS: 29 tons/yr, TN: 12546 lbs/yr.
Wetland Restoration	Twin Lakes/Goose Creek Drainage Area	Implement 46 acres of restored wetland basins to achieve pollutant reduction of: TP: 202 lbs/yr, TSS: 25 tons/yr, TN: 13810 lbs/yr.
Wetland Restoration	Shell Rock River Outlet Drainage Area	Implement 55 acres of restored wetland basins to achieve pollutant reduction of: TP: 204 lbs/yr, TSS: 23 tons/yr, TN: 13878 lbs/yr.
Grassed Waterway	Twin Lakes/Goose Creek Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 33 lbs/yr, TSS: 4 tons/yr, TN: 757 lbs/yr.
Grassed Waterway	Shell Rock River Outlet Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 32 lbs/yr, TSS: 2 tons/yr, TN: 843 lbs/yr.
WASCOB	Shell Rock River Outlet Drainage Area	Implement 2 WASCOBs to achieve pollutant reduction of: TP: 10 lbs/yr, TSS: 1 tons/yr, TN: 283 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	0 acres costing $0	55 acres costing $2,750	110 acres costing $5,500	193 acres costing $9,625	193 acres costing $9,625	A	$27,500	$27,500	SRRWD/ SWCD	
	0 acres costing $0	79 acres costing $3,950	158 acres costing $7,900	277 acres costing $13,825	277 acres costing $13,825	A	$39,500	$39,500	SRRWD/ SWCD	
	0 acres costing $0	5 acres costing $39,100	9 acres costing $78,200	16 acres costing $117,300	16 acres costing $156,400	A	$391,000	$391,000	SRRWD/ SWCD	
	0 acres costing $0	6 acres costing $39,100	11 acres costing $117,300	19 acres costing $156,400	19 acres costing $156,400	A	$469,200	$469,200	SRRWD/ SWCD	
Subtotal A1	**$-**	**$84,900**	**$208,900**	**$297,150**	**$336,250**		**$927,200**	**$927,200**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	1 Grassed Waterway/s costing $10,000	A	$20,000	$20,000	SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	1 Grassed Waterway/s costing $10,000	A	$20,000	$20,000	SRRWD/ SWCD	
	0 WASCOB/s costing $0	0 WASCOB/s costing $0	0 WASCOB/s costing $0	1 WASCOB/s costing $5,000	1 WASCOB/s costing $5,000	A	$10,000	$10,000	SRRWD/ SWCD	

Table 4-5: Shell Rock River Outlet Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A2 Surface Water Quality Continued		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Twin Lakes/Goose Creek Drainage Area	Plant conservation cover perennials on 94 acres and achieve pollutant reduction of: TP: 61 lbs/yr, TSS: 5 tons/yr, TN: 4542 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Shell Rock River Outlet Drainage Area	Plant conservation cover perennials on 131 acres and achieve pollutant reduction of: TP: 69 lbs/yr, TSS: 3 tons/yr, TN: 5121 lbs/yr.
B1 Erosion and Sediment Control		
Cover Crops	Twin Lakes/Goose Creek Drainage Area	Plant cover crops on 550 acres of cropland to achieve pollutant reduction of: TP: 142 lbs/yr, TSS: 34 tons/yr, TN: 8768 lbs/yr.
Cover Crops	Shell Rock River Outlet Drainage Area	Plant cover crops on 790 acres of cropland to achieve pollutant reduction of: TP: 184 lbs/yr, TSS: 29 tons/yr, TN: 12546 lbs/yr.
Wetland Restoration	Twin Lakes/Goose Creek Drainage Area	Implement 2847 acres of restored wetland basins to achieve pollutant reduction of: TP: 202 lbs/yr, TSS: 25 tons/yr, TN: 13810 lbs/yr.
Wetland Restoration	Shell Rock River Outlet Drainage Area	Implement 409 acres of restored wetland basins to achieve pollutant reduction of: TP: 204 lbs/yr, TSS: 23 tons/yr, TN: 13878 lbs/yr.
Grassed Waterway	Twin Lakes/Goose Creek Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 33 lbs/yr, TSS: 4 tons/yr, TN: 757 lbs/yr.
Grassed Waterway	Shell Rock River Outlet Drainage Area	Implement 2 grassed waterways to achieve pollutant reduction of: TP: 32 lbs/yr, TSS: 2 tons/yr, TN: 843 lbs/yr.
WASCOB	Shell Rock River Outlet Drainage Area	Implement 2 WASCOBs to achieve pollutant reduction of: TP: 10 lbs/yr, TSS: 1 tons/yr, TN: 283 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Twin Lakes/Goose Creek Drainage Area	Plant conservation cover perennials on 94 acres and achieve pollutant reduction of: TP: 61 lbs/yr, TSS: 5 tons/yr, TN: 4542 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Shell Rock River Outlet Drainage Area	Plant conservation cover perennials on 131 acres and achieve pollutant reduction of: TP: 69 lbs/yr, TSS: 3 tons/yr, TN: 5121 lbs/yr.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	0 acres costing $0	9 acres costing $4,700	19 acres costing $9,400	33 acres costing $16,450	33 acres costing $16,450	A	$47,000	$47,000	SRRWD/ SWCD	
	0 acres costing $0	13 acres costing $6,550	26 acres costing $13,100	46 acres costing $22,925	46 acres costing $22,925	A	$65,500	$65,500	SRRWD/ SWCD	
Subtotal A2	**$-**	**$11,250**	**$22,500**	**$64,375**	**$64,375**		**$162,500**	**$162,500**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal B1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		

Table 4-5: Shell Rock River Outlet Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
B2 Protect Soil Health		
Expand Acres Implementing Soil Health Practices	Twin Lakes/Goose Creek Drainage Area	Plant Cover Crops to create 550 acres of newly implemented soil health practices.
Expand Acres Implementing Soil Health Practices	Shell Rock River Outlet Drainage Area	Plant Cover Crops to create 790 acres of newly implemented soil health practices.
C1 Protect Sites of High Ecological Value		
Enhance Critical Habitat Areas	Highly Critical Habitat Areas	Enhance 427 acres of highly critical habitat area.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Target working lands adjacent to highly critical habitat areas.	Expand protected land area adjacent to critical habitat areas.
C2 Restore Wetland and Upland Habitat		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Shell Rock River Outlet Management Area	Establish 225 acres of perennial vegetation.
Wetland Restoration	Shell Rock River Outlet Management Area	Establish 101 acres of upland area to restored wetlands.
Restore Upland Habitat Areas	Shell Rock River near Glenville	Restore 21 acres of habitat along stream-bank.
Restore Upland Habitat	Headwaters of Shell Rock River Downstream of Albert Lea Lake	Restore 25 acres of upland habitat along Shell Rock River.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	See Timeline under “A1 Surface Water Quantity”								SRRWD/ SWCD	
	See Timeline under “A1 Surface Water Quantity”								SRRWD/ SWCD	
Subtotal B2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$-	$-	$4,300	$8,600	$8,600	A	$21,500	$21,500	SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal C1	**$-**	**$-**	**$4,300**	**$8,600**	**$8,600**		**$21,500**	**$21,500**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	$-	$132,610	$-	$-	$-	A	$132,610	$132,610	SRRWD	
	$775,625	$-	$-	$-	$-	A	$775,625	$775,625	SRRWD/ SWCD	
Subtotal C2	**$775,625**	**$132,610**	**$-**	**$-**	**$-**		**$908,235**	**$-**		

Table 4-5: Shell Rock River Outlet Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
D1 Improve Degraded Aquatic Habitat		
In-Lake Habitat Improvements	Upper/Lower Twin Lakes	Create in-lake and shoreline habitat structures for improved fisheries habitat in Upper and Lower Twin Lakes Lake.
Lake Level Drawdown	Upper/Lower Twin Lakes	Conduct a lake level drawdown if deemed necessary later in Plan 10-year period.
D2 Invasive Species		
Manage Carp Populations	Lakes with Carp Populations	Manage Carp so they do not exceed 100 kg/hectare.
E1 Groundwater Protection		
Cover Crops	Priority Locations to protect highly vulnerable aquifers.	Plant cover crops on 272 acres.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Priority Locations to protect highly vulnerable aquifers.	Plant perennial vegetation on 46 acres.
Shell Rock River Outlet Management Area Total		

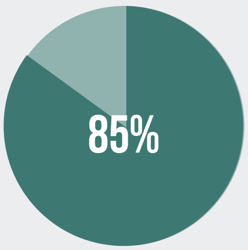
	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	$-	$-	$-	$-	$-	B	$-	$-	SRRWD	MNDNR
	$-	$-	$-	$-	$-	B	$-	$-	SRRWD/ SWCD	MNDNR
Subtotal D1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	See Timeline under "D1 Improve Degraded Aquatic Habitat"								SRRWD	MNDNR
Subtotal D2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal E1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$775,625	**$228,760**	**$235,700**	**$370,125**	**$409,225**		**$2,019,435**	**$1,111,200**		

FAST FACTS

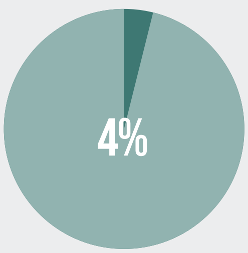
Area
71 mi²
(Rank 3 of 4)

Population (2010 Census)
1,138
(Rank 4 of 4)

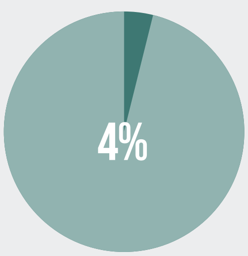
DOMINANT LAND COVER



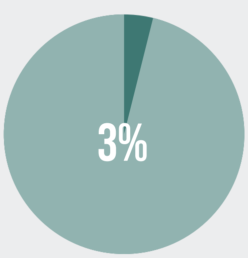
CULTIVATED CROPS



WETLANDS



DEVELOPED LAND



OPEN WATER

4.7 WINNEBAGO RIVER

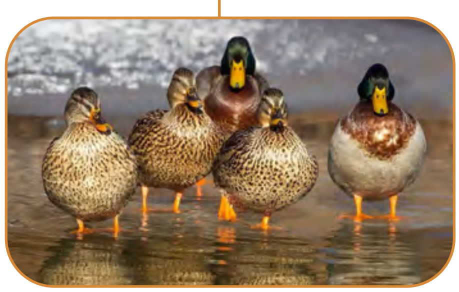
The Winnebago River management zone is the third largest management zone (71 square-miles) of the four in the SRWRW area. This management area makes up the entirety of the Winnebago River watershed. The management area landscape is dominated by cultivated crops (85%), followed by wetlands (4%), developed (4%), and open water (3%). City population centers located in the Winnebago River management zone include Emmons (2015 population: 413) and Conger (2015 population: 176). Water features of importance in this management zone include Bear Lake and Lime Creek. Bear Lake is a shallow lake with a maximum depth of 6 feet and provides habitat for waterfowl. Lime Creek flows from the outlet of Bear Lake to the Iowa border at the outlet of watershed. This management zone is divided into two drainage areas, the Bear Lake (39 square-miles) and Winnebago River watershed outlet (32 square-miles) drainage areas. The landcover is similar in both drainage areas with Bear Lake mostly being cultivated crops (84%) followed by wetlands (5%), open water (4%), and developed (4%), and Winnebago River Watershed outlet mostly cultivated crops (86%) followed by developed (4%), and wetlands (3%). Population totals based on 2010 census data for each drainage area are: Bear Lake (537) and Winnebago River Watershed outlet (601) making it the least populated management zone.

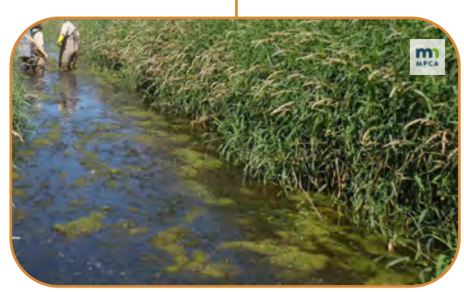
WINNEBAGO RIVER

Drainage Areas/Major Tributaries

North	South
Bear Lake	Winnebago River Watershed outlet
39 mi²	32 mi²
84% Cultivated Crops 5% Wetlands 4% Open Water 4% Developed Land	86% Cultivated Crops 4% Developed Land 3% Wetlands

KEY FEATURES


Bear Lake - Waterfowl


Headwaters of the Winnebago River

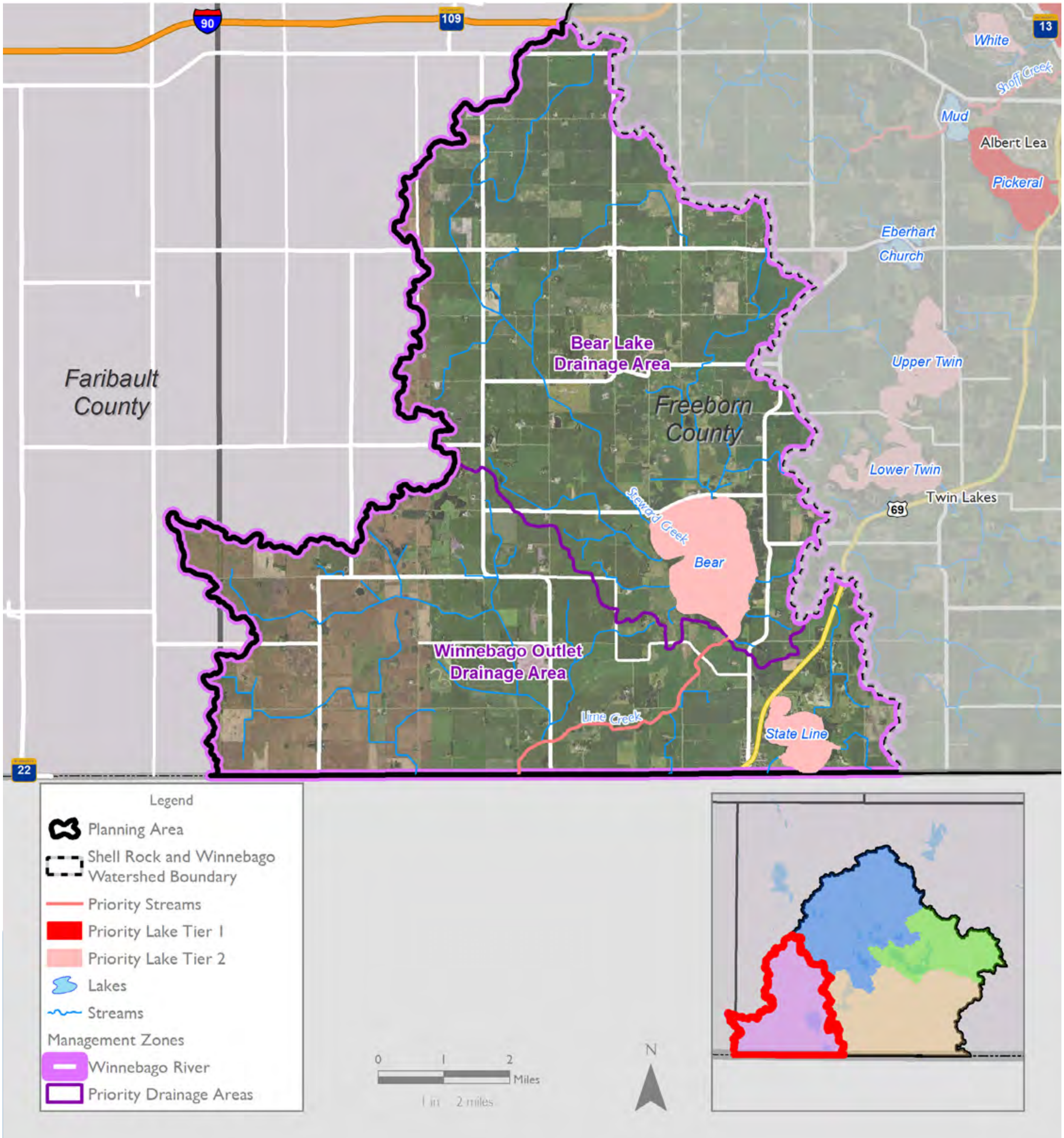


Figure 4-6: Winnebago River Management Zone

Table 4.6: Winnebago River Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A1 Surface Water Quantity		
Cover Crops	Bear Lake Drainage Area	Plant cover crops on 454 acres of cropland and create 10.1 acre-feet of water storage.
Cover Crops	Winnebago River Outlet Drainage Area	Plant cover crops on 504 acres of cropland and create 11.2 acre-feet of water storage.
Wetland Restoration	Bear Lake Drainage Area	Implement 32 acres of restored wetland basins to create 166.5 acre-feet of water storage.
Wetland Restoration	Winnebago River Outlet Drainage Area	Implement 37 acres of restored wetland basins to create 195.9 acre-feet of water storage.
A2 Surface Water Quality		
Cover Crops	Bear Lake Drainage Area	Plant cover crops on 454 acres of cropland to achieve pollutant reduction of: TP: 104 lbs/yr, TSS: 30 tons/yr, TN: 6447 lbs/yr.
Cover Crops	Winnebago River Outlet Drainage Area	Plant cover crops on 504 acres of cropland to achieve pollutant reduction of: TP: 135 lbs/yr, TSS: 20 tons/yr, TN: 10881 lbs/yr.
Wetland Restoration	Bear Lake Drainage Area	Implement 32 acres of restored wetland basins to achieve pollutant reduction of: TP: 123 lbs/yr, TSS: 16 tons/yr, TN: 8380 lbs/yr.
Wetland Restoration	Winnebago River Outlet Drainage Area	Implement 37 acres of restored wetland basins to achieve pollutant reduction of: TP: 171 lbs/yr, TSS: 14 tons/yr, TN: 13992 lbs/yr.
Grassed Waterway	Bear Lake Drainage Area	Implement 1 grassed waterway to achieve pollutant reduction of: TP: 16 lbs/yr, TSS: 1 tons/yr, TN: 375 lbs/yr.
Grassed Waterway	Winnebago River Outlet Drainage Area	Implement 1 grassed waterway to achieve pollutant reduction of: TP: 22 lbs/yr, TSS: 2 tons/yr, TN: 531 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Bear Lake Drainage Area	Plant conservation cover perennials on 86 acres and achieve pollutant reduction of: TP: 51 lbs/yr, TSS: 6 tons/yr, TN: 3491 lbs/yr.

	TIMELINE									
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	0 acres costing $0	45 acres costing $2,270	91 acres costing $4,540	159 acres costing $7,945	159 acres costing $7,945	A	$22,700	$22,700	SRRWD/ SWCD	
	0 acres costing $0	50 acres costing $2,520	101 acres costing $5,040	176 acres costing $8,820	176 acres costing $8,820	A	$25,200	$25,200	SRRWD/ SWCD	
	0 acres costing $0	3 acres costing $39,100	6 acres costing $78,200	11 acres costing $78,200	11 acres costing $78,200	A	$273,700	$273,700	SRRWD/ SWCD	
	0 acres costing $0	4 acres costing $39,100	7 acres costing $39,100	13 acres costing $117,300	13 acres costing $117,300	A	$312,800	$312,800	SRRWD/ SWCD	
Subtotal A1	**$-**	**$82,990**	**$126,880**	**$212,265**	**$212,265**		**$634,400**	**$634,400**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	0 Grassed Waterway/s costing $0	A	$10,000	$10,000	SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	0 Grassed Waterway/s costing $0	1 Grassed Waterway/s costing $10,000	A	$10,000	$10,000	SRRWD/ SWCD	
	0 Grassed Waterway/s costing $0	9 acres costing $4,300	17 acres costing $8,600	30 acres costing $15,050	30 acres costing $15,050	A	$43,000	$43,000	SRRWD/ SWCD	

Table 4-6: Winnebago River Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A2 Surface Water Quality Continued		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Winnebago River Outlet Drainage Area	Plant conservation cover perennials on 97 acres and achieve pollutant reduction of: TP: 58 lbs/yr, TSS: 2 tons/yr, TN: 5362 lbs/yr.
B1 Erosion and Sediment Control		
Cover Crops	Bear Lake Drainage Area	Plant cover crops on 454 acres of cropland to achieve pollutant reduction of: TP: 104 lbs/yr, TSS: 30 tons/yr, TN: 6447 lbs/yr.
Cover Crops	Winnebago River Outlet Drainage Area	Plant cover crops on 504 acres of cropland to achieve pollutant reduction of: TP: 135 lbs/yr, TSS: 20 tons/yr, TN: 10881 lbs/yr.
Wetland Restoration	Bear Lake Drainage Area	Implement 1941 acres of restored wetland basins to achieve pollutant reduction of: TP: 123 lbs/yr, TSS: 16 tons/yr, TN: 8380 lbs/yr.
Wetland Restoration	Winnebago River Outlet Drainage Area	Implement 262 acres of restored wetland basins to achieve pollutant reduction of: TP: 171 lbs/yr, TSS: 14 tons/yr, TN: 13992 lbs/yr.
Grassed Waterway	Bear Lake Drainage Area	Implement 1 grassed waterway to achieve pollutant reduction of: TP: 16 lbs/yr, TSS: 1 tons/yr, TN: 375 lbs/yr.
Grassed Waterway	Winnebago River Outlet Drainage Area	Implement 1 grassed waterway to achieve pollutant reduction of: TP: 22 lbs/yr, TSS: 2 tons/yr, TN: 531 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Bear Lake Drainage Area	Plant conservation cover perennials on 86 acres and achieve pollutant reduction of: TP: 51 lbs/yr, TSS: 6 tons/yr, TN: 3491 lbs/yr.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Winnebago River Outlet Drainage Area	Plant conservation cover perennials on 97 acres and achieve pollutant reduction of: TP: 58 lbs/yr, TSS: 2 tons/yr, TN: 5362 lbs/yr.
B2 Protect Soil Health		
Expand Acres Implementing Soil Health Practices	Bear Lake Drainage Area	Plant Cover Crops to create 454 acres of newly implemented soil health practices.
Expand Acres Implementing Soil Health Practices	Winnebago River Outlet Drainage Area	Plant Cover Crops to create 504 acres of newly implemented soil health practices.

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	0 Grassed Waterway/s costing $0	10 acres costing $4,850	19 acres costing $9,700	34 acres costing $16,975	34 acres costing $16,975	A	$48,500	$48,500	SRRWD/ SWCD	
Subtotal A2	**$-**	**$9,150**	**$18,300**	**$42,025**	**$42,025**		**$111,500**	**$111,500**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal B1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
Subtotal B2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		

Table 4-6: Winnebago River Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
C1 Protect Sites of High Ecological Value		
Enhance Critical Habitat Areas	Highly Critical Habitat Areas	Enhance 103 acres of highly critical habitat area.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Target working lands adjacent to highly critical habitat areas.	Expand protected land area adjacent to critical habitat areas.
C2 Restore Wetland and Upland Habitat		
Conservation Cover Perennials (convert working lands to perennial vegetation)	Winnebago River Outlet Management Area	Establish 182 acres of perennial vegetation.
Wetland Restoration	Winnebago River Outlet Management Area	Establish 69 acres of upland area to restored wetlands.
D1 Improve Degraded Aquatic Habitat		
Lake Level Drawdown	State Line Lake	Conduct a lake level drawdown if deemed necessary later in Plan 10-year period.
Lake Level Drawdown	Bear Lake	Conduct a lake level drawdown if deemed necessary later in Plan 10-year period.
D2 Invasive Species		
Manage Carp Populations	Lakes with Carp Populations	Manage Carp so they do not exceed 100 lbs/hectare.
E1 Groundwater Protection		
Cover Crops	Priority Locations to protect highly vulnerable aquifers.	Plant cover crops on 298 acres.
Conservation Cover Perennials (convert working lands to perennial vegetation)	Priority Locations to protect highly vulnerable aquifers.	Plant perennial vegetation on 57 acres.
Winnebago River Outlet Management Area Total		

	TIMELINE									
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)	PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	$1,000	$1,000	$1,000	$1,000	$1,000	A	$5,000	$5,000	SWCD	
	See Timeline under "A2 Surface Water Quality"								SWCD	
Subtotal C1	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$1,000**		**$5,000**	**$5,000**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A1 Surface Water Quantity"								SRRWD/ SWCD	
Subtotal C2	$-	$-	$-	$-	$-		$-	$-		
	$-	$-	$-	$-	$-	B	$-	$-	SRRWD/ SWCD	MNDNR
	$-	$-	$-	$-	$-	B	$-	$-	SRRWD/ SWCD	MNDNR
Subtotal D1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	See Timeline under "D1 Improve Degraded Aquatic Habitat"									MNDNR
Subtotal D2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
	See Timeline under "A2 Surface Water Quality"								SRRWD/ SWCD	
Subtotal E1	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$1,000	**$93,140**	**$146,180**	**$255,290**	**$255,290**		**$750,900**	**$750,900**		

4.8 WATERSHED-WIDE

Implementation actions that are not targeted to a specific management zone were separated into a watershed-wide implementation table.

Table 4.7: Watershed-Wide Management Zone

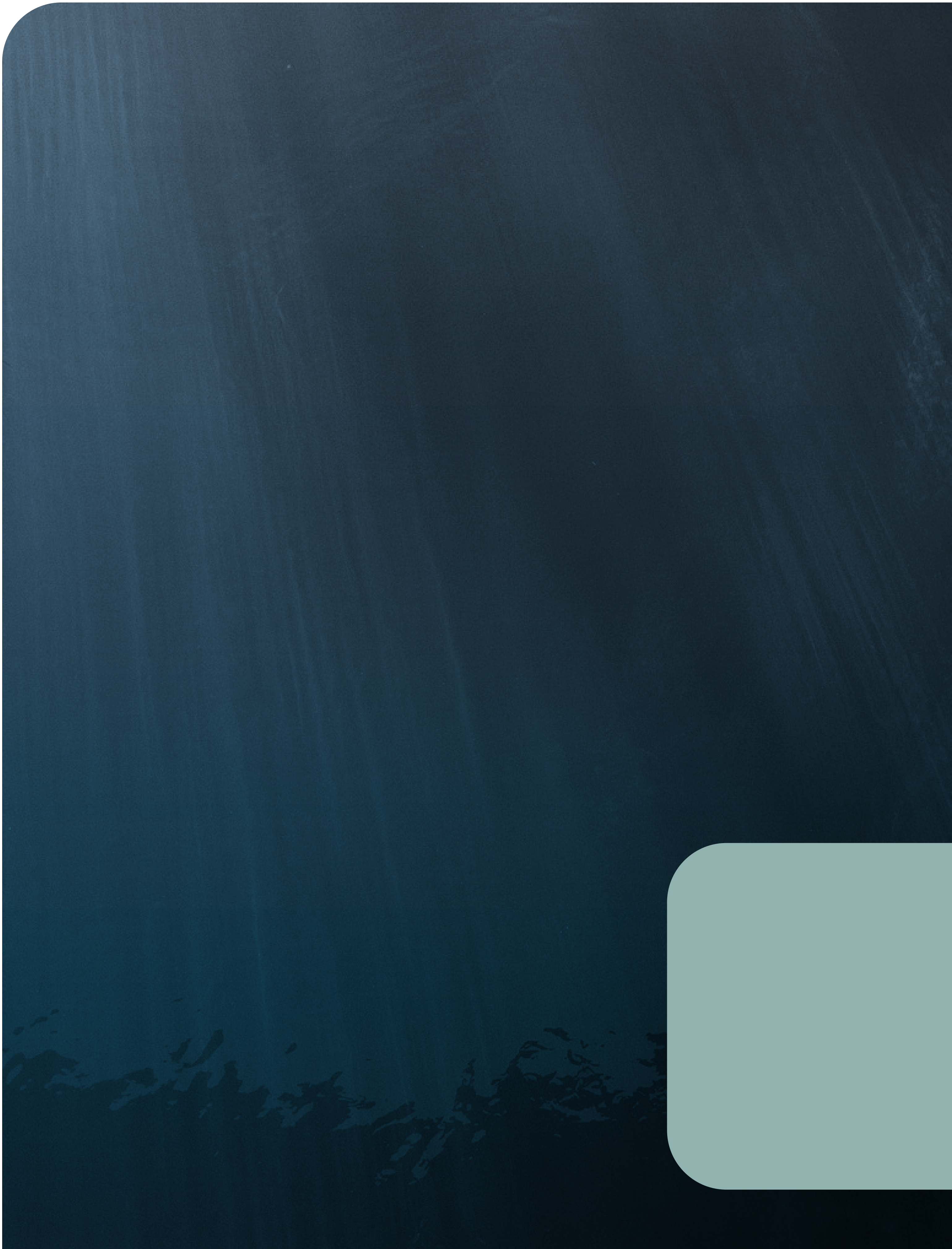
IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
A1 Surface Water Quantity		
Introduce New Water Storage Practices.	Fountain Lake Drainage Area	Implement 3 water storage practices including but not limited to two-stage ditches and drainage management.
Alternative Drainage Management	Watershed-Wide	Planning partners will collaborate with the drainage authority to advocate for alternative approaches to drainage management such as 3:1 ditch side slopes and controlled tile drainage.
A2 Surface Water Quality		
Replace/Upgrade Failing or Non-Compliant Septic Systems	Watershed-Wide	Replace or upgrade 40 failing or non-compliant septic systems.
Improve Priority Feedlots	Watershed-Wide	Improve feedlots as needed.
Manage Expanding Feedlots to Ensure Compliance	Watershed-Wide	Manage growing feedlots.
Water Quality Monitoring	Watershed-Wide	Conduct Water Quality Monitoring across watershed to track existing conditions and validate model results.
B1 Erosion and Sediment Control		
Outreach and Education	Watershed-Wide	Conduct outreach and education in smaller urban areas to promote awareness of stormwater management actions.
Street Sweeping	Watershed-Wide	Conduct street sweeping in smaller urban areas that don't own street sweeper units
Inventory Failing Streambanks	Watershed-Wide	Conduct inventory of failed streambanks and County Ditch Systems across the watershed to identify locations for future stream-bank restoration work.
Restore/Stabilize Eroding and Failing Streambanks	Locations Identified in Failing Streambank Inventory	Restore failing streambanks identified in the inventory assessment using approaches such as natural channel design.
Outreach and Education	Watershed-Wide	Conduct outreach and education to inform property owners along ditch systems of benefits of 3:1 slopes for long term sustainability and cost reductions.

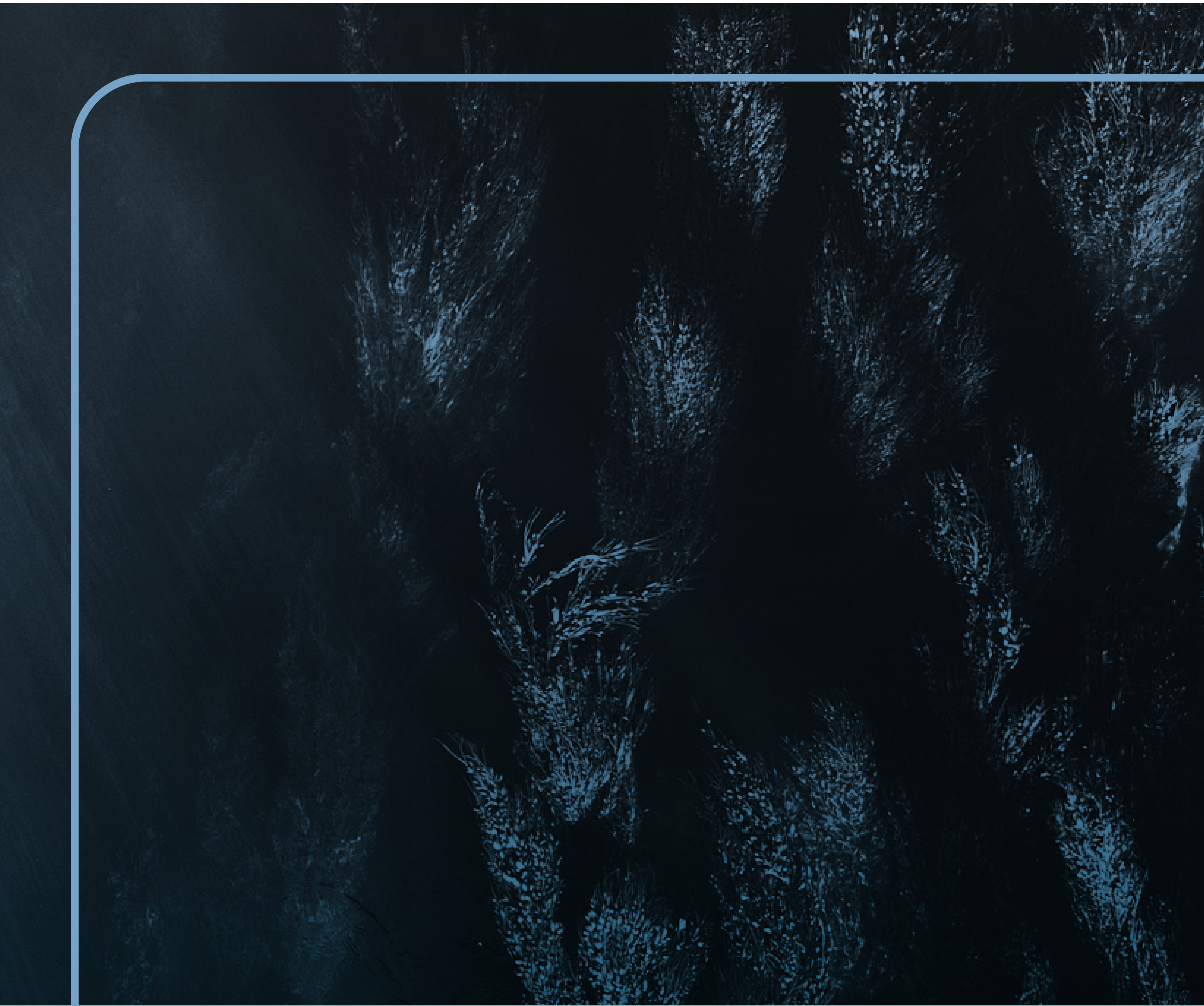
	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	$-	$-	$-	$-	$-	C	$-	$50,000	SRRWD/ SWCD	
	$-	$-	$-	$-	$-	C	$-	$-	County/ SRRWD/ SWCD	
Subtotal A1	**$0**	**$0**	**$0**	**$0**	**$0**		**$-**	**$50,000**		
	$-	Replace/ Upgrade 10 Septic systems costing $50,000	Replace/ Upgrade 10 Septic systems costing $50,000	Replace/ Upgrade 10 Septic systems costing $50,000	Replace/ Upgrade 10 Septic systems costing $50,000	A	$200,000	$200,000	County	
	$-	$-	$-	$-	$-	N/A	$-	$-	County	
	$-	$-	$-	$-	$-	N/A	$-	$-	County	
	$80,000	$80,000	$80,000	$80,000	$80,000	A	$400,000	$400,000	SRRWD	MPCA
Subtitle A2	**$80,000**	**$130,000**	**$130,000**	**$130,000**	**$130,000**		**$600,000**	**$600,000**		
	$1,000	$1,000	$1,000	$1,000	$1,000	A	$5,000	$5,000	City of Albert Lea/ SRRWD	
	$20,000	$20,000	$20,000	$20,000	$20,000	A	$100,000	$100,000	SRRWD	
	$-	$10,000	$-	$-	$-	A	$10,000	$10,000	SRRWD/ SWCD	MDNR
	$-	$-	$-	$-	$-	B	$-	$-	SRRWD/ SWCD	MDNR
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD	
Subtotal B1	**$31,000**	**$21,000**	**$21,000**	**$21,000**	**$21,000**		**$115,000**	**$115,000**		

Table 4.7: Watershed-Wide Management Zone

IMPLEMENTATION ACTION	LOCATION	MEASURABLE OUTPUT FOR THIS ACTIVITY
C3 Groundwater Quantity and Quality		
Seal Wells	Watershed-Wide	Seal a minimum of 5 unused or abandoned wells per year.
Track Nitrate Testing Results	Watershed-Wide	Track results of private well nitrate tests that exceed 3 mg/L. in database or spreadsheet that will be shared with planning partners and partnering state agencies to identify problem areas if present.
Outreach and Education	Watershed-Wide	Inform public regularly that county provides funding to seal private wells.
Outreach and Education	Watershed-Wide	Increase public's awareness on Arsenic and it's risks in groundwater
Replace/Upgrade Failing or Non-Compliant Septic Systems	Watershed-Wide	Replace/Upgrade 40 Failing or Non-Compliant Septic Systems
Improve Priority Feedlots	Watershed-Wide	Improve Feedlots as needed
Manage Expanding Feedlots to Ensure Compliance	Watershed-Wide	Manage growing feedlots
D1 Improve Degraded Aquatic Habitat		
Track MIBI/FIBI Scores	Watershed-Wide	Track changes in MIBI/FIBI scores when updated by MPCA.
Inventory Failing Streambanks	Watershed-Wide	Conduct inventory of failed streambanks across the watershed to identify locations for future streambank restoration work.
Outreach and Education	Watershed-Wide	Increase public's awareness on recreational activities that negatively impact shoreline habitat and vegetation.
D2 Invasive Species		
Outreach and Education	Watershed-Wide	Increase public's awareness on impacts of aquatic invasive species through topics shared monthly via watershed districts Facebook page and information in watershed district's email chain 3 times per year.
E1 Groundwater Protection		
Support MDH in Establishing a Wellhead Protection Plan	Watershed-Wide	Establish a minimum of two additional wellhead protection plans by providing MDH with necessary support.
Develop County Geologic Atlas	Watershed-Wide	Provide support to help establish a Freeborn County Geologic Atlas
Watershed-Wide Area Total		

	TIMELINE					PROJECT FUNDING TIER (A/B/C)	TIER A PROJECT (COST)	TOTAL ESTIMATED COST FOR ALL FUNDING TIERS	LEAD LGU	SUPPORTING AGENCY
	Years 1-2 ($$)	Years 3-4 ($$)	Years 5-6 ($$)	Years 7-8 ($$)	Years 9-10 ($$)					
	$-	$15,000	$15,000	$15,000	$15,000	A	$60,000	$60,000	County	
	$-	$-	$-	$-	$-	N/A	$-	$-	County	
	$1,000	$1,000	$1,000	$1,000	$1,000	A	$5,000	$5,000	County	MDH
	$200	$200	$200	$200	$200	A	$1,000	$1,000	County	MDH
	See Timeline under "A2 Surface Water Quality"								County	
	See Timeline under "A2 Surface Water Quality"								County	
	See Timeline under "A2 Surface Water Quality"								County	
Subtotal C3	**$1,200**	**$16,200**	**$16,200**	**$16,200**	**$16,200**		**$66,000**	**$66,000**		
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD	MPCA
	See Timeline under "B1 Erosion and Sediment Control"								SRRWD	MNDNR
	$100	$100	$100	$100	$100	A	$500	$500	SRRWD	
Subtotal D1	**$100**	**$100**	**$100**	**$100**	**$100**		**$500**	**$500**		
	$-	$-	$-	$-	$-	N/A	$-	$-	SRRWD	
Subtotal D2	**$-**	**$-**	**$-**	**$-**	**$-**		**$-**	**$-**		
	$-	$-	$-	Supporting MDH's efforts	Supporting MDH's efforts	N/A	$-	$-	SRRWD/ County/ MDH	MDH
	$-	$-	$-	$-	$-	N/A	$-	$-	County	
Subtotal E1	**$-**	**$-**	**$-**	**$-**	**$-**	**N/A**	**$-**	**$-**		
	$102,300	**$177,300**	**$167,300**	**$167,300**	**$167,300**		**$781,500**	**$831,500**		





CHAPTER 5.0
PLAN IMPLEMENTATION PROCESS

5.0 PLAN IMPLEMENTATION PROCESS

Plan implementation programs support the implementation actions and are necessary to ensure that the Plan goals are accomplished.

5.1 INCENTIVE PROGRAMS

Incentive programs are formal programs used to promote specific actions or behaviors. Various mechanisms can be used for conducting incentive programs including financial assistance or providing benefits for enrolling in programs. The Partnership organizations will strive to coordinate incentive programs to provide consistency across the watershed while following the targeting approach identified in Chapter 4 to guide project selection and dispersal of funds.

Cost Share Programs

In a cost-share program, the costs of systems or practices that are designed to protect and improve surface and groundwater quality, habitat, and soil and water resources are shared between the landowner and a sponsoring entity such as the local, state, or federal government. The BMPs and conservation practices (CPs) typically eligible are those that avoid, control, and trap nutrients, sediment, and E. coli from entering surface water and groundwater. Structural practices that may be eligible include sediment-control structures or streambank stabilization projects. Nonstructural practices that may be eligible include soil health practices such as cover crops, no till and strip till farming, and adding perennials to a crop rotation, etc., and manure management planning services, along with the implementation of those plans. Eligibility may vary depending on local priorities and needs.

Minnesota Agriculture Water Quality Certification Program

The Minnesota Agricultural Water Quality Certification Program (MAWQCP) provides an opportunity for producers to voluntarily enroll in this program. By enrolling, producers agree to implement and maintain approved farm management practices and obtain certification that their operation protects surface waters from the impacts of agricultural practices. Technical and financial assistance is prioritized for those who enroll but are not yet certified. After participants have been certified, they obtain regulatory certainty for a period of 10 years.

MINNESOTA WATER QUALITY CERTIFIED FARM

REMAIN CERTIFIED FOR 10 YEARS!

Fee Discounts

Local governments or nonprofit entities may offer reduction in fees for implementing projects and practices that align with program goals; for instance, public-drainage authorities could offer discounted permit application, review, and inspection fees if the landowner voluntarily implements a rate reduction project, or stormwater fees could be reduced if a landowner voluntarily converts cropped acres to a permanent vegetative cover.

Low Interest Loans

Low interest loans may be available through various state agencies to landowners for agricultural best management practices, septic system replacement, or other projects that meet funding eligibility criteria.

Fountain Lake dredging project

1M+ CUBIC YARDS
OF MATERIAL REMOVED

FALL 2021
PROJECTED COMPLETION DATE OF PHASE 2

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

1,500 ACRES
IMPACTED BY COMPLETED PROJECTS

$4.5M +
IN GRANT MONEY FOR COMPLETED PROJECTS

1,500 ACRES
TO BE IMPACTED BY FUTURE PROJECTS

$7M
ADDITIONAL GRANT MONEY FOR FUTURE PROJECTS

5.2 CAPITAL IMPROVEMENT PROJECTS

Definition

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 incentive and cost-share programs. The types of projects eligible to be considered as a capital improvement typically provide significant regional benefits and may require feasibility studies before design and construction. These projects require operations and maintenance (O&M) plans for the life of the project including inspection plans to ensure the project's effectiveness. An easement or land acquisition are both potential components of capital improvement projects. These projects are often completed in cooperation with multiple entities and are good candidates for state or federal grant funding.

Current Projects

Large scale projects already underway in the planning area are addressing concerns for a variety of high priority resources. These projects are highlighted by Fountain Lake dredging, wetland habitat restoration enhancement, and permanent protection projects. The Fountain Lake dredging project is a multi-year effort lead by the SRRWD to remove phosphorus laden sediment that contributes to internal loading from Edgewater Bay, Dane's Bay, and Main Bay. The project is currently in phase two which will be completed in the fall of 2021 and will result in over one million cubic yards of material being removed from Fountain Lake. Funding for the first two phases has come from a combination of state funds ($7.5 million) and local option sales tax ($9.5 million). The SRRWD is also leading efforts to restore, enhance, and protect significant areas of native habitat across the planning area. SRRWD was awarded grant money through the Lessard-Sams Outdoor Heritage Council to fund this work on habitat across the planning area. The SRRWD has completed projects impacting roughly 1,500 acres using over $4.5 million in grant money with plans to improve an additional 1,500 acres using an additional $7 million in grant money. The largest individual project planned will restore 232 acres of fish habitat in Fountain Lake using over $1 million in grant funding. These projects continue a long history of the SRRWD securing significant funding to support it's management of natural resources.

Future Projects

Opportunities to implement large scale projects in the future will largely depend on the ability to secure necessary funding. The Partnership has identified the priority projects which are included in the implementation tables. These projects are phase three of the Fountain Lake dredging project, conducting dredging on Albert Lea Lake, and a series of urban Best Management Practices (BMPs) in the City of Albert Lea. Funding options to complete these projects will be explored by the planning team during the development of each biennium's workplan. Keeping water on the land to reduce flooding and streambank erosion will require wetland restoration and other projects suitable for integrating with large-scale, multi-purpose drainage management projects across the entire planning region. The Partnership will regularly engage with drainage inspectors and drainage authorities to ensure that drainage projects are consistent with the goals of the Plan. Where possible, the Partnership will assist drainage authorities in integrating water storage, water quality, and habitat improvements into drainage projects.

5.3 OPERATION AND MAINTENANCE PLANS

After BMP and capital improvement construction is completed, regular inspections and maintenance are important to keep the project functioning at its design capacity and life expectancy. The parties responsible for operations and maintenance (O&M) inspection procedures and enforcement will vary based on the type of project, funding entity, and contractual requirements. O&M plans must be prepared before construction. The O&M plans should include expected activities, timing of activities, and an inspection schedule. Information should also be developed on the procedure to be followed if the inspection determines maintenance is required or if required maintenance has not been performed, including potential penalties or enforcement actions. Minnesota State Rules 8400.1700 and 8400.1750 outline program requirements for projects funded through state cost-share programs.

Program Requirements Outline

Minnesota State Rules 8400.1700 and 8400.1750

Inspections should be conducted on a regular basis and after significant weather events throughout the life of the practice to confirm that the O&M plan is being followed and that the practice is still performing as designed. Site inspections should include a written record, photographs, and a report regarding the status of the practice and outline repairs or maintenance required. Inspection records should be kept throughout the life of the practice to verify maintenance activities. Ultimately, local staff will determine the appropriate level of rigor required in an O&M plan for a given project. An example of the general outline for an O&M plan recommended by BWSR is as follows:

- Conservation practice with a minimum effective life of 10 years: the years that end in 1, 3, and 9 following the certified completion.
- Capital-improvement projects having a minimum effective life of 25 years: the years that end in 1, 8, 17, and 24 following certified completion is a recommended minimum.

If easements were acquired as part of a conservation practice or capital improvement project, or if a conservation practice is not being maintained as per contract requirements, appropriate measures authorized by Minnesota state rules will be used to compel compliance.

PUBLIC OUTREACH ACTIVITIES

- structured
- informative

- targeted audience
- meant to achieve the highest level of plan implementation possible

- active participation
- build trust
- address questions or concerns

PUBLIC ENGAGEMENT ACTIVITIES

GENERAL OUTREACH ACTIVITIES

- newsletters
- social media posts
- appearances at various public events

5.4 OUTREACH AND EDUCATION PROGRAM

The Plan is primarily a restoration plan and also includes goals and actions that protect resources from degradation. As such, an effective public outreach program is crucial to achieving watershed goals. Restoration plans have easily identified audiences who are eager to find information on how they can participate in land management and improvement programs. The Partnership understands that they must coordinate outreach campaigns and activities to create awareness of the importance of restoring watershed health and to inspire landowners, organizations, and visitors to take actions to prevent degradation of resources.

Public outreach, including both information and education, is an integral part of the Plan goals. The success of this Plan relies on individuals changing their behavior and adopting practices that reduce their impact on watershed resources. Success also relies on local government authorities adopting policies that will result in better protection, mitigation of future impacts, and management of watershed resources. To achieve these outcomes, the Plan will employ a wide range of outreach and engagement activities that are structured around the watershed goals. Specific outreach and engagement activities are listed in the watershed wide implementation table. However, these actions are not intended to be distinct, standalone activities but rather are intended to be fully integrated into all programming efforts to support the Plan goals.

This Plan includes both outreach and public engagement activities. Outreach activities are typically prepared and delivered to various targeted audiences. These activities are structured, and communication is typically one-way with the goal of informing the targeted audience. In comparison, public engagement activities are structured to generate active participation with the targeted audience. Active participation helps to build trust, and address questions or concerns from the target audience.

The Partnership will leverage both outreach and public engagement activities to achieve the highest level of Plan implementation possible. Partnership organizations have long-standing relationships with landowners throughout the planning area and will build upon this trust to deliver implementation results. Targeted outreach actions will be conducted by contacting individual landowners via mail and social media outlets. The locations of this outreach will be guided by the priority targeting approach for each implementation action described in previous chapters within this Plan. General outreach activities to increase public awareness will be shared via newsletters, social media posts, and appearances at various public events. Engagement opportunities will be made available via the Citizens Advisory Committee meetings that are led by the SRRWD. These meetings will include landowners outside of the SRRWD boundaries but within the planning area boundaries.

5.5 LAND USE MANAGEMENT

Implementing the restoration and protection practices and projects outlined in Chapter 4 will achieve the goals of the Plan if no additional, future impacts occurred in the watershed. Therefore, mitigating these impacts is critical to reducing risk to watershed health. It is uncertain what effect climate factors, water availability, and economics will have on natural resources in the Shell Rock River–Winnebago River Watersheds. Due to these factors, land use controls are an important tool for protecting against decline in quality of the watershed resources in the Shell Rock River and Winnebago River watersheds. Existing land use controls will be leveraged to reduce impacts from shoreland development and harmful land-management practices.

Opportunities exist for land use authorities to manage planning for the long-term protection of resources in the Shell Rock River and Winnebago River Watersheds in a way that balances economic growth with ecological and environmental management. A key aspect of a successful land use program is obtaining consistent requirements and enforcement of land use management controls across the watersheds.

Land Use Management Plans

1 Describe the land use authorities within the watershed

2 Describe potential opportunities to achieve goals through, or potential conflicts with, comprehensive land use plans

LAND USE MANAGEMENT PLANS

County and municipal comprehensive or land use management plans are important tools that guide future land management activities to prevent harmful impacts to environmental and economic concerns. These plans indicate where orderly growth will occur and must include goals for protecting open space and the environment.

The goals and objectives contained in comprehensive plans are reflected in the zoning ordinances, permit standards, and conditional use criteria that the county or municipality employs to ensure the comprehensive land use management plan goals are obtained. Although watershed districts in Minnesota do not implement land use controls, they do have the ability to "control the use and development of land in the floodplain and the greenbelt and open space areas of the watershed district" (103D.335, Subd 19). The date of the most recent comprehensive land use management plans for each partnering LGU is listed in table 5.1.

Table 5.1: Comprehensive Land Use Plans and Adoption Dates

LGU	COMPREHENSIVE PLAN AND ADOPTION DATE
Shell Rock River Watershed District	Comprehensive Watershed Management Plan - 2015
Freeborn County Adopted by SWCD	Comprehensive Land Use Policy Plan (Chapter 24, Article II of County Ordinances) - 2017
City of Albert Lea	Comprehensive Plan – 2008 (updated plan to be completed in 2023)

STATE ORGANIZATIONS

LAND USE MANAGEMENT CONTROLS

Local units of government, including counties, cities, townships, and watershed districts, are responsible for regulating land-use controls and implementing various state programs and legislation, such as the MNDNR Shoreland Management Program and Minnesota's Wetland Conservation Act. In addition to local controls, federal and state laws, regulations, and rules are in place that relate to watershed and natural resource management. The Shell Rock River Watershed District regulatory controls are focused on wetland protection, floodplain management, and pollution control. A summary and a table of the regulatory controls most related to watershed management is presented in the "Existing Regulatory Controls" section below. Local governments can provide up-to-date information regarding regulatory controls.

RECOMMENDATIONS

A key aspect of a successful land use management programs is the consistent application of standards and criteria in planning, zoning, and permitting as well as enforcement of land use management controls. Opportunities exist for land use authorities to achieve consistency and manage planning for the long-term protection of watershed resources in a way that balances economic growth with ecological and environmental needs. Implementation actions identified in this plan will help participating LGU's achieve their land use plan goals. These actions include:

- Implementation of restored wetlands in targeted areas.
- Restoring native habitat in floodplain areas.
- Tracking growth of feedlots to ensure they maintain necessary management practices.

INFLUENCING STATE POLICY

The Partnership members are eligible to participate in their respective associations: Minnesota Association of Soil and Water Conservation Districts (MASWCD), Association of Minnesota Counties (AMC), League of Minnesota Cities (LMC), and Minnesota Association of Watershed Districts (MAWD). Each association has a resolution and policy process and platform. The Local Implementation Work Group (LIWG) will review issues of significant importance and brainstorm potential policies to improve regulatory support on an annual basis. The Partnership will seek opportunities to improve watershed management programs through various channels including local, regional, and statewide organizations.

Existing Regulatory Controls

Local units of government, including counties, cities, and townships are responsible for regulating land-use controls and implementing various state programs, such as the shoreland program. Table 5-2 provides a summary of current local regulatory controls. The SRRWD is not a permitting district and therefore is not included in the table but has adopted the rules.

In addition to the local controls, federal and state laws, regulations, and rules are in place that relate to watershed and natural resource management. A summary of the regulatory controls most related to watershed management is provided in the following descriptions.

Table 5-2: Existing Regulatory Controls or Program Management by Planning Partners

MEETS   MANAGES   NONE/NA

REGULATORY CONCERN	FREEBORN COUNTY	FREEBORN COUNTY SWCD	CITY OF ALBERT LEA
Wetland Management	Meets	None/NA	Meets
Floodplain Management	Meets	Manages	Meets
Shoreland Management	Meets	None/NA	Meets
Buffer Management	Meets	Manages	None/NA
Subsurface Sewage Treatment Systems	Meets	None/NA	None/NA
Groundwater/Surface Water Use	None/NA	None/NA	Meets
Aquatic Invasive Species	None/NA	None/NA	None/NA
Terrestrial Invasive Species	Meets	None/NA	None/NA
Feedlots	Meets	None/NA	None/NA
Extraction	None/NA	None/NA	Meets
Soil Loss	None/NA	Manages	Meets
Forest Land Protection	None/NA	None/NA	Meets
Agricultural Land Protection	Meets	Manages	None/NA
Stormwater Runoff	None/NA	None/NA	Meets
Urban Expansion/Annexation	None/NA	None/NA	Meets
Land Use (Comprehensive Land Use Plan)	Meets	Manages	Meets

Wetland Regulations

MN Statute portions of 103B and 103G

MN State Rule Chapter 8420

Wetland Management

There are regulatory controls that govern the discharge of dredged or fill materials into waters of the United States including wetlands. U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency share responsibilities for implementing Section 404 of the Clean Water Act. Section 401 of the Clean Water Act requires certification of water quality compliance measures. This certification is a requirement of various federal permit programs and is implemented at the state level by the MPCA. USDA implements the Federal Farm Bill policies regarding draining or filling wetlands for farm program participation. Minnesota also has the Wetland Conservation Act (WCA) that is intended to result in "no-net loss" of wetlands through various mitigation, replacement, and permitting activities. BWSR administers the program however, the program is implemented through local governments. The WCA entities within the planning area are Freeborn County and the City of Albert Lea for wetlands within the city's boundary.

Floodplain Management

The Federal Emergency Management Agency (FEMA) administers federal floodplain management, mapping, insurance, and flood-assistance programs. The MNDNR oversees state program and administers the National Flood Insurance Program for the state. Local zoning regulations identify permitted land use in the floodway, flood fringe, and floodplain. Digital Flood Insurance Rate Maps (DFRIMs) have been completed for Freeborn County (ftp://ftp.dnr.state.mn.us/pub/waters/floodplain/County_data/Freeborn/PDF/27047CV000A.pdf).

Shoreland Regulations

MN Statute 103F and MN Rules 6120.2500 – 3900

Shoreland Management

Minnesota has standards that are identified in rules and are overseen by the MNDNR. Local governments are required to adopt land-use controls that protect shorelands along rivers and lakes. Freeborn County has adopted and administered the state required shoreland land use controls.

Buffer Regulations

Minnesota Statutes 103B and 103F.48, Subd. 4.

Buffer Management

Buffers are required on public waters and drainage systems. According to legislation enacted in 2015, buffers of perennial vegetation are required to be an average of 50 feet with a minimum of 30 feet on public waters and 16.5 feet for public drainage systems. Flexibility is provided if other practices provide the same water quality benefit as a buffer. Exceptions are allowed for areas that are covered by roads, buildings, or other structures; areas that are enrolled in the EQIP; public-water accesses; and municipalities that follow federal and state stormwater requirements. BWSR is the regulatory authority of this program, which is operated at the county level. Freeborn County has elected to enforce the state buffer law through a locally adopted ordinance, while BWSR carries a responsibility for state oversight of those entities implementing and enforcing the ordinance at the local level.

Point Source Pollution

Mandates regulating point sources of pollution were a major component of the Clean Water Act which was passed in 1972. The U.S. Environmental Protection Agency (EPA) is responsible for regulating point sources through the National Pollutant Discharge Elimination System (NPDES). The Minnesota Pollution Control Agency (MPCA) implements this program, which includes municipal sewage treatment plants, industrial discharges, stormwater, and concentrated animal feeding operations (CAFOs) at the state level. Minnesota has general permits that govern activities such as confined animal feedlots and the standards are outlined in state rule. An example of a point source in the planning area is the City of Albert Lea's wastewater treatment plant.

Point Source Pollution Regulations

MN Statutes 115 and 116, as amended

MN Rules Chapters 7001, 7050, 7060 and 7090

MN Rules Chapters 7050 and 7052

Subsurface Sewage Treatment Systems

The goal of the Subsurface Sewage Treatment Systems (SSTS) program is to protect the public health and the environment by adequately dispersing and treating domestic sewage from dwellings or other establishments that generate volumes less than 10,000 gallons per day. SSTS requirements are adopted and enforced locally. Each county in the planning area may have grants available for SSTS upgrades for individuals that meet limited income qualifications.

Subsurface Sewage Treatment Systems Regulations

MN Statutes 115.55 and 115.56,

MN Rules Chapters 7080, 7081, 7082, 7083.

Waste Management

Waste-management permitting and regulatory programs are implemented by the MPCA. These programs include hazardous waste, storage tanks, and solid waste. Local land-use and zoning controls may regulate whether waste storage and handling facilities are a compatible use. Waste from areas within the watershed is disposed of at several landfills in Freeborn County. The Freeborn County Solid Waste Facility in Albert Lea accepts household hazardous waste.

Waste Management Regulations

MN Statutes 115.55

MN Rules Chapters 7001, 7035, 7045, 7150, 7151, 9215, 9220.

Groundwater/Surface Water (Sitting Wells)

A water use (appropriation) permit from MNDNR Division of Ecological Water Resources is required for all users withdrawing more than 10,000 gallons of water per day or one million gallons per year. The MNDNR is required to manage water resources to ensure an adequate supply to meet long-range seasonal requirements for domestic, agricultural, fish and wildlife, recreational, power, navigation, and quality control purposes. SWCDs and planning and zoning offices are offered the opportunity In addition to permitting water use, a Groundwater Protection rule (MR1573) was recently adopted in the state to minimize the potential sources of nitrate pollution. The rule restricts the application of nitrogen fertilizer in the fall and on frozen soils in areas identified as vulnerable to contamination.

Groundwater/Surface Water Use Regulations

MN Statute 103G for appropriation; 103H, 1989 Groundwater Act

Groundwater Protection Rule

MN Rules Chapter 1573

Invasive Species

MNDNR has regulatory authority over aquatic plants and animals, and terrestrial vertebrates. The Minnesota Department of Agriculture (MDA) has regulatory authority over terrestrial plants (noxious weeds) and plant pests. Each county has an agriculture inspector whose responsibility is to ensure that all laws and rules related to noxious weeds are carried out. There is no counterpart for aquatic plants and animals or terrestrial vertebrates.

Feedlot Regulations

MN Rules Chapter 7020

Public Waters Regulations

MN Statute 103G.245

Extraction/Extractive Use Regulations

MN Statute 93.44—93.51 and amendments thereto

Public Drainage Systems Regulations

MN Statute 103E

Feedlots

The MPCA administers the feedlot regulations in Minnesota. Additionally, counties in the state may be delegated by the MPCA to administer the program for feedlots that are not required to have a state or federal permit (see Point Source Pollution above). Freeborn County is delegated by the MPCA to carryout 7020 rules.

Public Waters

The MNDNR administers the Public Waters Permit Work Permit Program which regulates activities below the Ordinary High-Water Level (OHWL) in public waters and wetlands. There are many activities that are required to be permitted prior to beginning work. These activities may include excavation, dredging, filling, putting in structures, and shore protection measures.

Extraction/Extractive Use

Counties are responsible for administering land use controls for extraction. Extractive use means the use of land for the removal of surface or subsurface sand, gravel, rock, industrial minerals, a nonmetallic mineral, or peat not regulated by Minnesota statutes. Extractive Use mining may include construction sand and gravel used in concrete, aggregates, concrete products, asphalt, road base, fill, snow and ice control and other miscellaneous uses. Peat, black dirt, rock, and other soils are used extensively for landscaping.

Public Drainage Systems

Artificial drainage (subsurface drainage tile and open ditches) was used historically to increase the amount of arable land. Over the past several decades, more extensive tiling (pattern tiling) has been used to optimize crop production by ensuring soil moisture does not prevent planting at the optimal time or create undesired crop stress due to excess soil/surface moisture. Public drainage systems are publicly managed drainage systems that provide outlets for private tile and ditches. Management of public drainage systems by drainage authorities (typically counties or watershed districts) is governed by Minnesota Statute 103E. Drainage authorities work with landowners to ensure adequate drainage and enforcement of relevant regulations (e.g., buffer requirements). Freeborn County is delegated by the MPCA to carryout 7020 rules and is the only drainage authority for the entire planning area. A summary of the drainage systems under Freeborn County's authority are shown in Table 5-3.

Table 5-3: Drainage Systems Under The Freeborn County Ditch Authority for Management in the Shell Rock River–Winnebago River Watersheds

DITCH NAME	MANAGEMENT ZONE	TOTAL SYSTEM LENGTH (MILES)
CD J5	Fountain Lake	10.1
CD 5	Winnebago River	5.8
CD J9	Fountain Lake	10.3
CD 11	Fountain Lake	14.2
CD 15	Albert Lea Lake	4.1
CD 16	Shell Rock River	23.4
CD 17	Shell Rock River	6.2
CD J19	Albert Lea Lake	1.0
CD J20	Shell Rock River	12.9
CD J21	Fountain Lake	9.7
CD J22	Albert Lea Lake	11.1
CD 23	Winnebago River	20.7
JCD J25	Winnebago River	11.8
CD J26	Winnebago River	14.0
CD 32	Albert Lea Lake	22.9
CD 40	Shell Rock River	14.8
CD 49	Shell Rock River	6.9
CD 54	Fountain Lake	12.8
CD 55	Shell Rock River	33.7
CD 62	Albert Lea Lake	18.2
CD 63	Fountain Lake	16.9
CD 65	Fountain Lake	13.2
CD 68	Fountain Lake	11.1
CD 76	Shell Rock River	3.9
CD 77	Fountain Lake	24.3
CD 79	Winnebago River	13.1

5.6 MONITORING PROGRAM

An important component of watershed management is understanding watershed conditions and trends. It is also important to gain knowledge about our lesser understood resources. Data obtained through research and monitoring programs provides the information that allows implementation actions to be adapted and tailored to meet changing conditions. This section of the Plan presents information about current monitoring and data gathering efforts, identifies potential future data gathering and research efforts, and provides information about the organizations and programs that are involved in monitoring and research efforts.

Data collected through locally led efforts will use standard methods and protocols and will be integrated in locally led modeling and resource management projects. Data acquired though local efforts may be submitted to the appropriate agency. Agencies are responsible for updating state sponsored modeling and resource assessment efforts, such as the Hydrological Simulation Program – Fortran (HSPF) and Minnesota's Watershed Approach with the data acquired through local efforts.

Additional resources

Summary information and several in-depth reports can be found on the MPCA website. Simply open your web browser and enter the search term 'MPCA Shell Rock River' or 'MPCA Winnebago River' to find the MPCA's Shell Rock River and Winnebago River watershed pages. Some of the information that you will find includes:

- The Shell Rock River Watershed Monitoring and Assessment Report
- The Shell Rock River Watershed Biotic Stressor Identification Report
- The Winnebago River and Upper Wapsipinicon River Watersheds Monitoring and Assessment Report
- The Winnebago River Stressor Identification Report

Key Concept: IBI

What is an Index of Biological Integrity (IBI)?

Biological integrity is the ability of a stream, lake, or wetland to support a healthy and diverse population of organisms. An IBI uses a number of biological data and indicators to create an overall assessment of biological conditions. Since an index is cumulative assessment, IBIs are used to rate resources in relation to each other.

SURFACE WATER

Streams

- There are 62 active or recently sampled stream monitoring sites across the planning area with the MPCA maintaining 49 and the SRRWD maintaining 13 locations. Sites with the largest dataset include major tributaries to lakes and the Shell Rock River. Stream monitoring locations are shown in Figure 6-2.
- Water monitoring data includes analysis of a variety of potential pollutants and includes Phosphorus, Orthophosphorus, Total Suspended Solids, Nitrate and Nitrite, Dissolved Oxygen, and Temperature.
- The USGS maintains a long-term, flow monitoring station on the Shell Rock River upstream of the Iowa boarder.
- The MPCA conducts stream monitoring roughly every 10 years as a part of the intensive watershed approach. The first round of monitoring in the Shell Rock River and Winnebago River watersheds began in 2009 and 2015 respectively and the second round was completed in 2019/2020.

Lakes

- There are 60 active or recently sampled lake monitoring sites across the planning area with the MPCA maintaining 48 and the SRRWD maintaining 12 locations. Sites with the largest dataset include Fountain Lake, Pickerel Lake, and Albert Lea Lake. Lake monitoring locations are shown in Figure 6-2.
- Water monitoring data includes analysis of a variety of potential pollutants with a focus on Phosphorus, Total Suspended Solids, water clarity, Dissolved Oxygen, Chlorophyll-a, and temperature.
- The MPCA conducts lake monitoring roughly every 10 years as a part of the intensive watershed monitoring approach. The first round of monitoring in the Shell Rock River and Winnebago River watersheds began in 2009 and 2015 respectively, and the second round was completed in 2019/2020.
- The state's Citizens Monitoring Program provides useful information on lake water clarity which is used to calculate long-term water clarity trends. Currently, there are five active citizen monitoring sites in the planning area.

INDICATOR (N.)

A metric, benchmark, or measuring stick used to determine progress towards goals. In some cases, when a metric is not clear or feasible, the indicator might be the number of inputs or outputs themselves.

GROUNDWATER

- Numerous organizations are involved in monitoring groundwater quality and quantity. Figure 5-2 provides a graphical overview of the state agencies involved in monitoring groundwater.
- The MPCA monitors water quality conditions in three rural wells in the Shell Rock River Watershed and one rural well in the Winnebago River Watershed.
- The MNDNR in partnership with Freeborn County monitors groundwater quantity through the MNDNR's Cooperative Groundwater Monitoring Program. There are a total of eight monitoring wells in Freeborn County.
- The MDA maintains one ambient monitoring well in the planning area and monitors for nitrates and pesticides.
- The MDH requires all new wells installed to be tested for nitrate, arsenic, and bacteria. The MDH also monitors all public water systems for drinking water standards required in the EPA Safe Drinking Water Act.
- Water from private wells can be tested by Freeborn County (https://www.co.freeborn.mn.us/182/Water) or any MDH accredited labs (https://www.health.state.mn.us/communities/environment/water/docs/wells/waterquality/labmap.pdf).

HABITAT

- As part of the MPCA's Intensive Watershed Monitoring Program, rivers and select lakes are tested for fish and invertebrate population abundance and diversity. The resulting assessment is an index of biologic integrity (IBI). If the biological populations are impaired, streams and lakes are assessed to determine what is causing the stress to the biologic community. Stressors include a loss of habitat, low dissolved oxygen (DO) excessive sediment, altered hydrology, or a lack of stream connectivity. Results from this assessment can be found in the MPCA's Stressor Identification Reports.
- The MNDNR's Watershed Health Assessment Framework (WHAF) provides information that helps to target habitat focused projects using the Wildlife Action Network Layer and can be accessed at https://www.dnr.state.mn.us/mnwap/mnwap_resources.html. Additional layers that are included in this tool that can be used include perennial cover, wetland loss, soil erosion susceptibility, terrestrial habitat, biological diversity, and many other upland items. Additionally, the National Wetland Inventory (NWI) inventories the existing wetlands, and Duck's Unlimited has studied where restorable wetlands exist.
- The MNDNR fisheries conduct fish-population surveys on most lakes on a three- to six-year rotation depending on lake size, public access, and fisheries management goals, objectives, and projects.

CLIMATE

Periodic summaries of recent and long-term weather-reporting station data may be helpful in modifying monitoring activities and interpreting data to reflect weather variability. Data summaries are available from the Minnesota Climatology Office (http://climate.umn.edu/) and the Midwestern Regional Climate Center (http://mrcc.isws.illinois.edu/CLIMATE/) with local reporting stations near Albert Lea. The MNDNR's WHAF also includes climate summaries for each watershed which can be accessed at https://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/climate_summary_index_map.pdf.

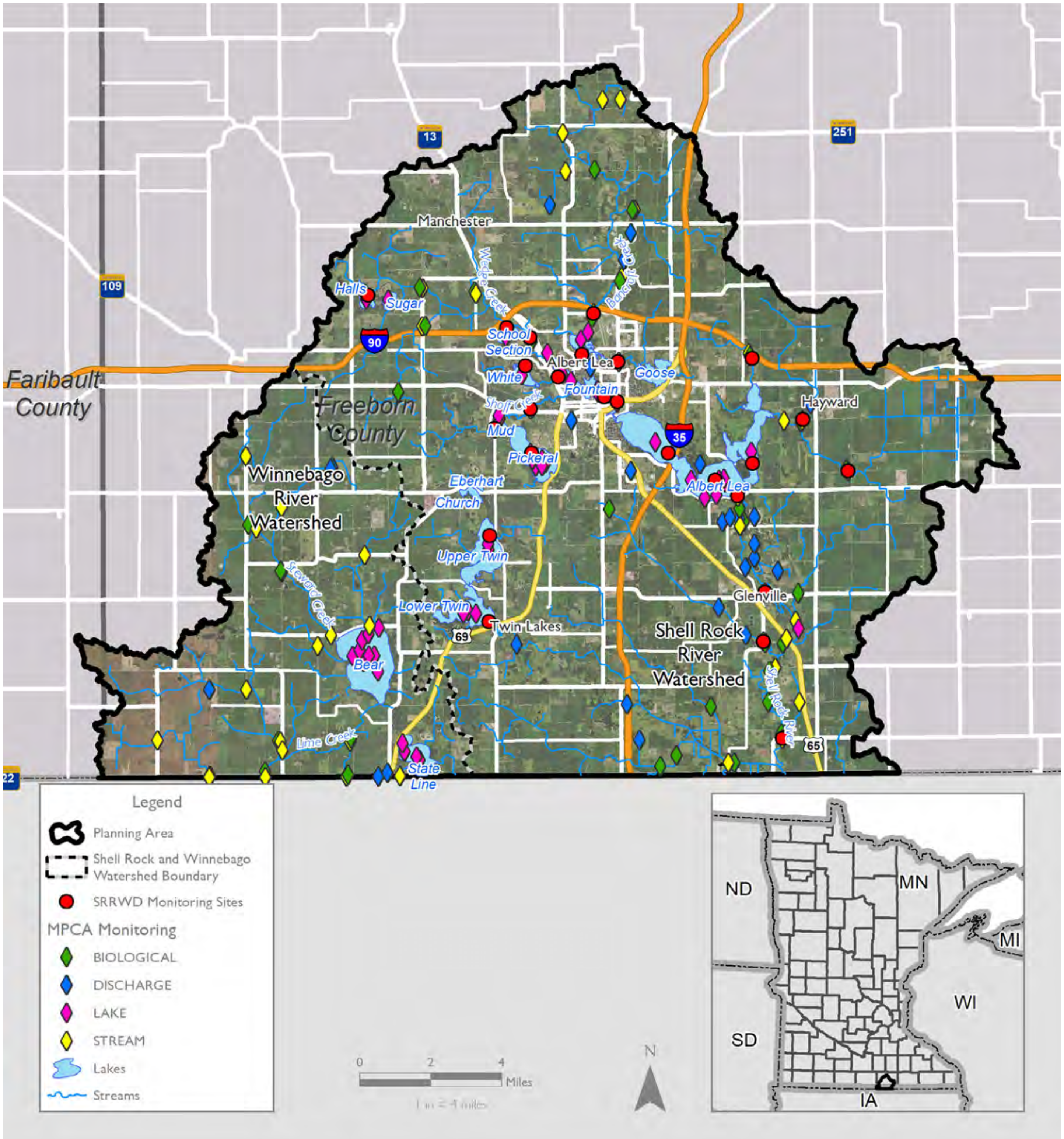


Figure 5-1: Shell Rock River–Winnebago River USGS (Flow), SRRWD (Flow and WQ), and MPCA (Biological, Lake, and Stream) Monitoring Locations with Data After the Year 2000.

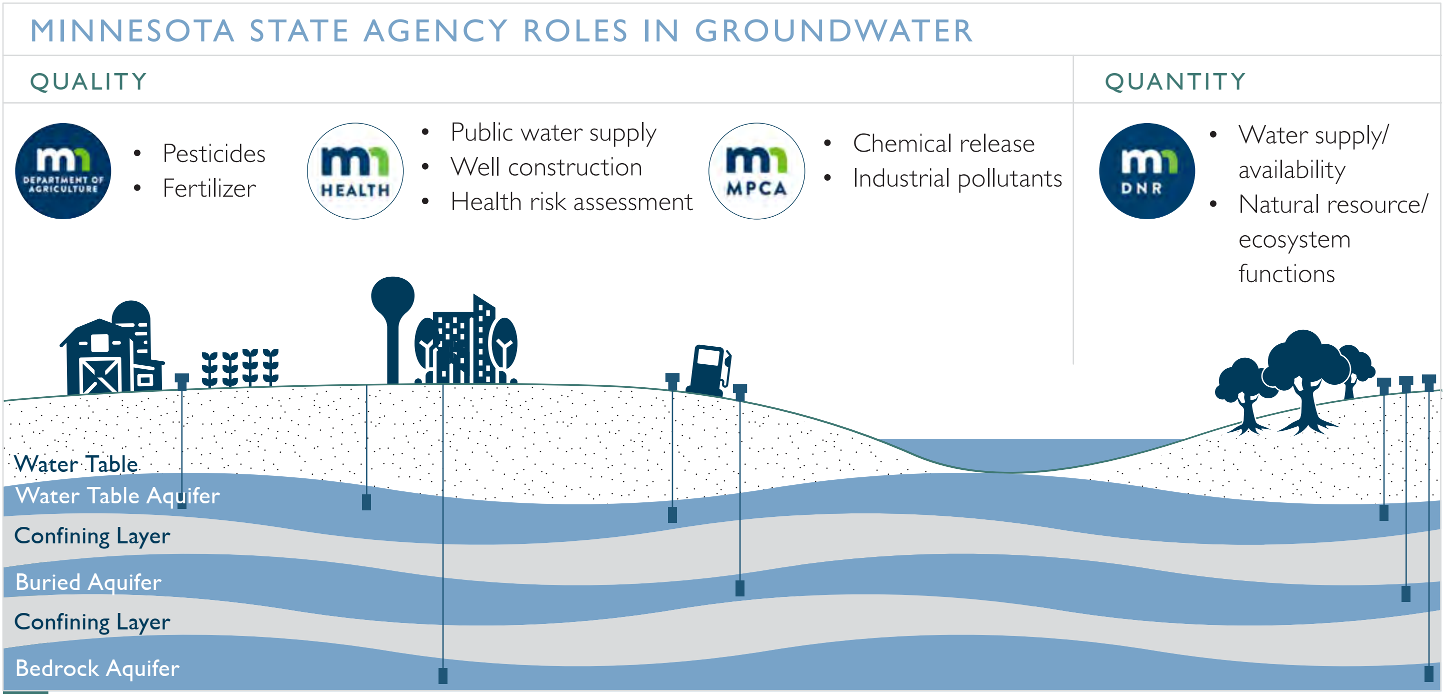


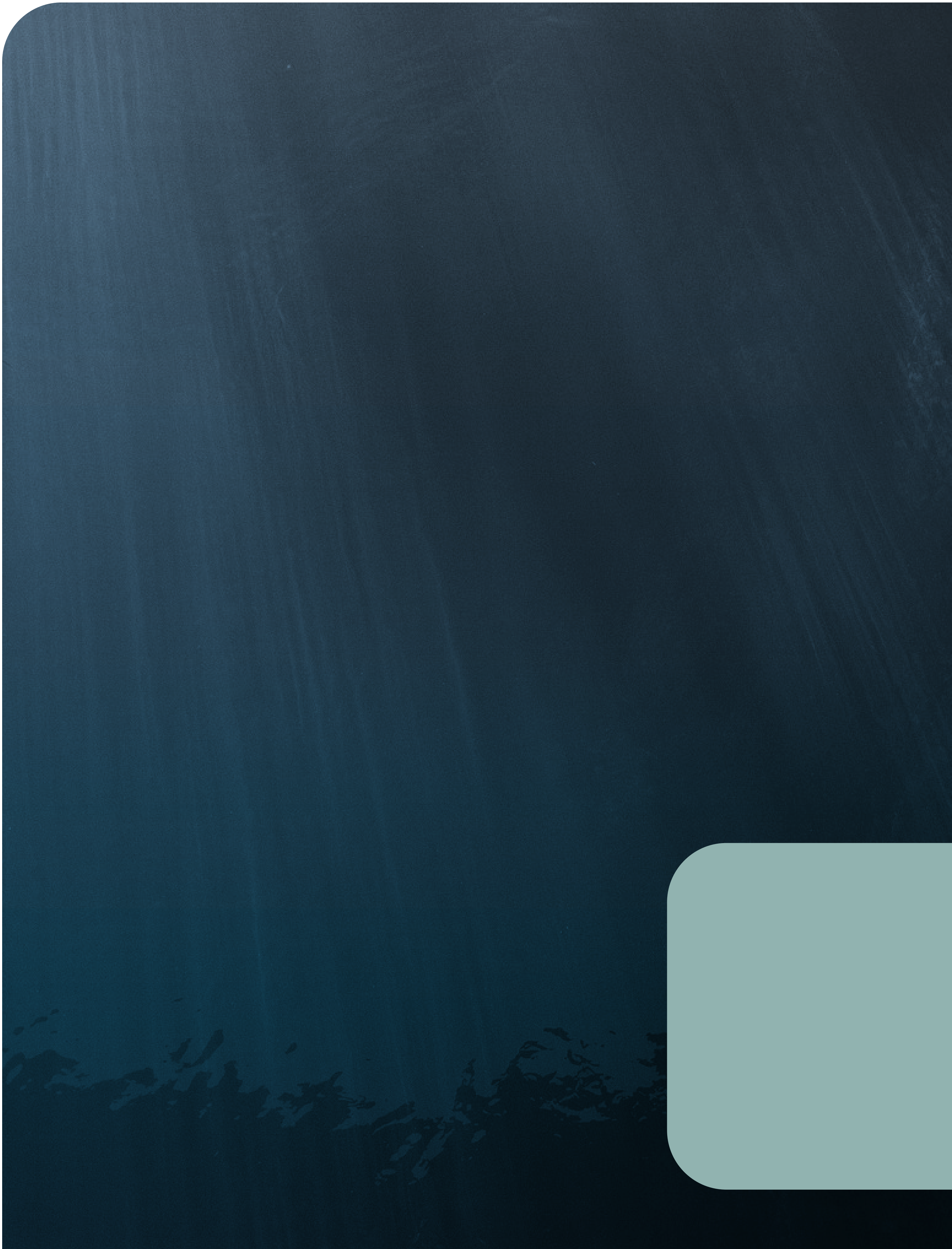
Figure 5-2: Schematic of Agencies Involved in Groundwater Monitoring

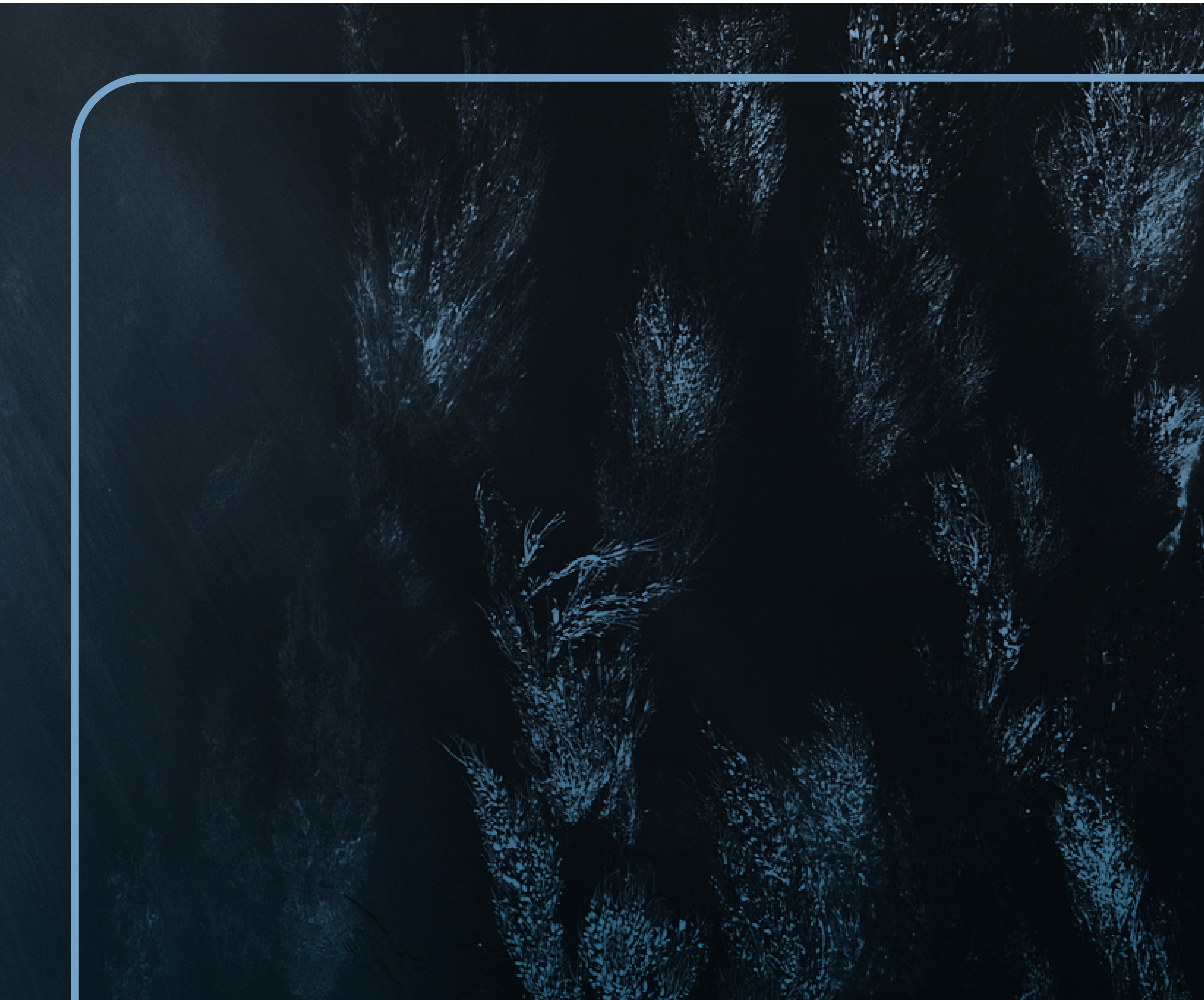
Future Monitoring Considerations, Resources, and Goals

Additional data, information, and studies are needed to better assess watershed conditions, evaluate implementation effectiveness and diagnostic analysis, detect trends, and fill data gaps. These efforts—aimed to better quantify watershed conditions, evaluate implementation effectiveness, and diagnostic analysis—will provide the information needed for future restoration and protection efforts. A summary of monitoring, data acquisition, and studies anticipated over the 10-year plan period, including whether efforts are new or continued, are indicated in Table 5.4. Additional details for these monitoring activities are provided in the implementation schedule located in Chapter 4. Specific monitoring efforts identified in the implementation schedule are intended to fill existing data gaps. These efforts will result in a better understanding of the existing areas using soil health practices, locations of flooding in Albert Lea, stream bank failures, and degraded lake shoreland conditions. Existing surface water quality monitoring will continue to be conducted by the SRRWD, to track changes in water quality conditions for priority waterbodies throughout the planning area. Monitoring locations will be guided in part by plan goals and data gaps that are identified during work planning. Planning partners will coordinate with state agencies as needed to support state monitoring goals such as continuous DO monitoring in ditches, assessing existing BMP effectiveness, tillage and crop residue surveys, and addition of flow gages.

Table 5-4: Future Monitoring and Data Collection Efforts

AREA	EFFORT	NEW MONITORING EFFORT AS A RESULT OF THE PLAN
Waterbodies	Water quality monitoring	
	Inventory failing streambanks	●
Upland	Quantify existing implementation level of soil health practices	●
Flooding	Track instances of flooding in Albert Lea	
Groundwater	Development of the Freeborn County Geologic Atlas	●
	Track private well testing results	●
	Provide support in developing a wellhead protection plan	●
Invasive Species	Develop invasive species management plan	●
Shoreland	Collect data to evaluate shoreland habitat quality	●





CHAPTER 6.0
PLAN ADMINISTRATION AND COORDINATION

6.0 PLAN ADMINISTRATION AND COORDINATION

This section describes how the watershed Partnership will work together, how the Plan will be administered, implemented, monitored, and funded.

6.1 DECISION MAKING AND STAFFING

A Memorandum of Agreement (MOA) was established by the local units of government for the development of the Shell Rock River-Winnebago River Comprehensive Watershed Management Plan (Plan). The Steering Committee recommended that a Joint Powers Collaboration (JPC) be established to form the basis of the formal agreement between participating entities to implement the Plan. The updated JPC will clearly establish the roles and responsibilities for all the participating entities to implement the projects identified in this Plan. The Shell Rock River Watershed District (SRRWD) will serve as the lead entity, fiscal agent, and hold final approval of bills paid. There will be three main groups in implementation, the Policy Advisory Committee (PAC), the Local Implementation Work Group (LIWG), and the Technical Advisory Committee (TAC).The JPC will 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 Statues § 471.59). The draft agreement does not include a financial obligation, but rather an ability to share resources.

Committees

The committees that have been created for the development of this Plan will continue in largely the same fashion with slight changes to their naming and composition and will carry out the coordinated implementation of the Plan. The parties agree to establish a PAC, LIWG, and a TAC. The PAC will be made up of one appointed representative from each governing entity and will establish bylaws to describe the functions and operations of all committees. The PAC's role will include providing oversight of plan implementation, providing recommendation to approve grant applications, grant agreements, interim reports, payment of invoices, and entering into professional contracts. The PAC shall also provide recommendation of approval of an annual work plan and annual budget consisting of an itemized statement of the Plan, revenues and expenses for the ensuing calendar years, and shall be presented to the respective governing entities that are represented on the PAC. The LIWG will be made up of local staff which will consist of, but not be limited to, local county water planners, watershed district staff, SWCD staff, and city staff. The LIWG will be tasked with the logistical day-to-day decision making in implementing the Plan and prepare the draft annual work plan and budget which will be presented to the PAC. Members of the TAC are appointed by the PAC and will include individuals from local, state (MPCA, DNR, MDH, MDA), and federal agencies, non-profits, and citizen organizations to provide support and make recommendations on implementation of the Plan as needed.

Coordination of Shared Services

The Partnership recognizes the benefit of obtaining efficiencies through shared service delivery. Throughout the implementation of the Plan, and particularly at the biennial planning and five-year evaluation benchmarks, the committees will assess appropriate use of shared services to ensure goals are achieved.

MEMORANDUM OF AGREEMENT(MOA):

Establishes roles and responsibilities

SRRWD
Shell Rock River Watershed District
Working Together to Improve Water Quality

SRRWD:

Lead entity and fiscal agent at the time of plan adoption

POLICY ADVISORY COMMITTEE (PAC)

One appointed representative from each participating entity

LOCAL IMPLEMENTATION WORK GROUP (LIWG)

Local technical staff from participating organizations

TECHNICAL ADVISORY COMMITTEE (TAC)

Local, state, federal, non-profit, citizen, lake associates, etc.)

Collaboration with Other Units of Government

The PAC and staff will actively seek opportunities for early coordination and collaboration with other units of government including cities, townships, federal agencies, and special purpose joint powers boards. Governmental units, including drainage authorities, that are not part of the JPC will be invited to participate in implementation activities where those activities are relevant to their own goals or implementation measures. Collaboration with state agencies such as BWSR, MPCA, MDH, MDA, and the MNDNR are critical for executing the programs and goals of the Plan. Federal government partners, including the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corp of Engineers (USACE), U.S. Geologic Survey (USGS), Natural Resources Conservation Service (NRCS), and Farm Service Agency (FSA), are not required participants, but their programs and staff expertise are necessary components to fulfilling Plan goals. The LIWG members may collaborate with NRCS and the FSA to convene local working groups to align Federal and Plan priorities and actions.

Collaboration with Others

To a large degree, the success in obtaining the Plan goals will depend on the local support that drives its implementation. The Partnership is committed to working with nongovernmental entities including civic groups, nonprofit entities, private businesses, volunteers, individuals, and foundations, many of which are already involved in protecting and improving resources in the Shell Rock River and Winnebago River watersheds. Current examples that highlight the partnerships collaboration with the community include the SRRWD's sponsorship of the Community Education Boat House and supporting the Albert Lea Lakes Foundation annual lake clean up event.

Examples of Plan's Potential Partners

- The Nature Conservancy
- Trout Unlimited
- Chamber of Commerce
- Minnesota Land Trust

6.2 WORK PLAN DEVELOPMENT

Work plan development starts with a LIWG review of recent implementation efforts. The goal of this review will be to achieve meaningful results while considering existing conditions and circumstances. Following this review, the LIWG will develop a draft annual work plan and budget based on the timing of actions identified in the implementation section of this Plan and available funding. The LIWG will present the draft annual work plan and budget to the PAC for recommendation of approval. The LIWG will review the PAC's recommendations to determine if changes will be made to the draft annual work plan. Following the review of the PAC's recommendations, the LIWG will finalize the annual work plan and submit to the entity/ies for approval following the agreed upon terms in the JPC. These approved annual work plans will be referenced when submitting the biennial funding requests to BWSR to identify the specific work that falls under the BWSR WBIF grant.

6.3 PLAN AMENDMENTS

This Plan is in effect for 10 years after obtaining state approval and local adoption. The activities described in this Plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. During the time that this Plan is in effect, new data will be generated that will provide a better understanding of watershed issues and solutions. Administrative authorities, state policies, and resource concerns may also change. Changes, additions, or clarifications to the Plan may be necessary to address the new and changing information. A plan amendment will be required when the requested change to the Plan includes revising a goal or deletion or adding a priority area. This does not include adding Prioritize, Target, or Measure information to an already identified priority area. Additional items may be determined to require an amendment. Revision requests that will not warrant an amendment process are listed below (not an exhaustive list).

- Formatting or reorganization of the Plan;
- Revision of a procedure meant to streamline plan administration;
- Clarification of existing plan goals or policies;
- Inclusion of additional data not requiring interpretation;
- Expansion of public process;
- Adjustments to how activities will be carried out within the discretion of the JPC, including adding more specific prioritized, targeted, or measurable locations and outcomes for activities; substituting different activities to achieve a plan goal; or removing activities deemed infeasible;
- References to or incorporation of prioritization studies completed since Plan approval.

If an amendment is required or requested by a member of the JPC, the PAC will initiate a plan amendment determination process following the procedures outlined in the MOA agreement and bylaws. Any party to the agreement may recommend a plan amendment. Any such recommendation will be reviewed by the LIWG, whose findings will be provided to the PAC. The partnership will consult with their BWSR staff to determine if an amendment is needed when revisions are being considered. The PAC will make a determination using the process specified in the bylaws regarding whether to proceed with the amendment. Any proposed amendment must undergo a 60-day comment period by all parties to the agreement and all TAC members of the JPC. The amendment must include a copy of plan pages showing stricken, added, and changed text and figures. Changes may be shown with callouts, notes, or other means. The amendment will be approved by PAC vote after the comment period. After approval, the amended Plan will be distributed to all parties including LIWG and TAC members. Expenses will be paid by the parties only as allowed in the MOA. When the PAC determines that a proposed amendment is solely for the purposes of one entity (e.g., a county) who has adopted the Plan to replace their local water plan, then the cost of the amendment process will be borne by that LGU.

6.4 ASSESSMENT AND EVALUATION

Accomplishment Assessment

The LIWG will use the annual work plan and budget as a tracking sheet for implementation actions and costs throughout the planning period. The tracking sheet will align anticipated outcomes contained in the annual work plan to measure progress towards planned implementation goals. An annual assessment of progress will be made at the beginning of the annual work plan development cycle to evaluate progress and adjust as needed based on identified implementation barriers, changes in capacity, and the adoption and success of practices and projects.

Progress towards overall measurable goal achievement will include tracking numerical goals, such as the number of septic system fixes; estimating pollution reductions using the spreadsheet calculator, models and tools, or verifying outcomes using evidence-based data collection and water quality monitoring.

Five-Year Evaluation

At the mid-point of the 10-year plan timeline, the JPC entities will conduct an evaluation of overall progress towards the 10-year and long-term goals. The evaluation will begin with an assessment of new data, information, updated models, and trends. This information will be used to evaluate whether the Plan's established measurable goals and priority issues still align with the outcomes of the updated information. In addition to reviewing updated data, an assessment will be made as to whether the 10-year goals will be met with the current pace of progress. The conclusions of these reviews will determine if additional resources are needed, or if the delivery of services should be adjusted to strengthen implementation efforts. If these changes are deemed necessary, the PAC will initiate a Plan amendment process.

Partnership Assessment

The Partnership will regularly assess their performance in implementing the programs and activities in the Plan and achieving goals throughout the life of the Plan in informal and formal ways. Informally, the LIWG will make adjustments as needed to leverage the Partnership's collective and individual strengths as funding and collaborative opportunities arise. Formally, the LIWG and the PAC will assess the degree to which goals were achieved and how to best organize and align efforts to fulfill Plan goals on a biennial basis. This will be done by comparing the plan goals and progress with the tracked progress during work plan development. If implementation progress is lacking in areas relative to the planned goals, the LIWG will discuss if and how resources could be better allocated to address these shortcomings. This process will ensure resources such as staffing, technical skills, and funding are being allocated efficiently to achieve plan goals. Any revisions to the roles and responsibilities amongst the JPC organizations will be reflected in the workplan.

Reporting

The fiscal agent (SRRWD) is responsible for submitting all required reports and completing annual reporting requirements for the Plan as required by state law and policy. The JPC organizations will assist in the development of the required reports and will continue to file their own reports as required. Additionally, the SRRWD will develop annual reports that highlight project implementation and summarize annual monitoring results when possible.

6.5 FUNDING

The following sections discuss existing local funding, funding needs, and potential funding sources. The extent to which the Plan activities can be accomplished is dependent on the level of funding that is available and staff capacity. The project team developed the Plan framework to represent a realistic, yet aggressive Plan. As such, multiple funding tiers were developed for the implementation table with the top tier including actions that are expected to be covered by existing funding sources. Additional implementation activities were identified for each priority issue that will require funding beyond what is currently available to implement. Potential funding sources to implement these additional activities are included in this section.

Current Local Funding, Annual Plan Cost, and Total Plan Cost

Current local funding and the estimated annual cost to implement the Plan and estimated total cost is outlined in Table 6-1 (costs presented in the table reflect total project costs, while various levels of cost sharing will be applied during plan implementation). The current local/state base funding amount is a sum of the five-year average of base funding for the SRRWD and annual revenue and expenditures for Freeborn County and Freeborn County SWCD based on the percentage of county land area in the Shell Rock River–Winnebago River watersheds. Also included in the funding amounts are the expected watershed-based implementation funding (WBIF) and secured grant funds. It is expected that the current level of investment by each local government unit will remain the same during the Plan time period.

The estimated cost to implement the Plan is presented by biennium for the funding Tier A projects as described in Chapters 3 and 4. All figures are rounded to simplify funding estimates. Details on programs activities, timelines, outcomes are provided in Chapter 4, the Targeted Implementation Plan. Note that some year columns show a deficit for funding the Plan. This is due to timing of funding and expected projects. Other funding sources will need to be awarded to fill these deficits. Funding sources and opportunities are highlighted in the following pages.

Table 6-1: Summary of Current Local Funding, Estimated Annual Cost, and Total Cost to Fund the Plan

ESTIMATED PLAN COST AND BASE LOCAL FUNDING AND SECURED GRANTS							
		Years 1 and 2	Years 3 and 4	Years 5 and 6	Years 7 and 8	Years 9 and 10	Total
Costs	Watershed-Wide	$102,300	$177,300	$167,300	$167,300	$167,300	$781,500
	Fountain Lake	$7,240,145	$5,056,900	$1,302,070	$1,302,070	$791,260	$15,693,450
	Albert Lea Lake	$2,692,000	$440,400	$543,700	$543,700	$343,000	$4,562,300
	Shell Rock River	$775,625	$228,760	$235,700	$370,125	$409,225	$2,019,435
	Winnebago Outlet	$1,000	$93,140	$146,180	$255,290	$255,290	$750,900
	Total Plan Costs:	**$10,811,070**	**$5,996,500**	**$2,394,950**	**$2,638,990**	**$1,966,075**	**$23,807,585**
Funds	WBIF*	$322,128	$322,128	$322,128	$322,128	$322,128	$1,610,640
	Local/State Base Funding	$2,696,000	$2,696,000	$2,696,000	$2,696,000	$2,696,000	$13,480,000
	LSOHC Grant**	$4,013,675	$2,000,000	$2,000,000		--	$8,013,675
	City of Albert Lea Secured Project Funds	$2,600,000	-	-	-	-	$2,600,000
	Total Plan Funds:	**$9,631,803**	**$5,018,128**	**$5,018,128**	**$3,018,128**	**$3,018,128**	**$25,704,315**
	Funding - Costs:	**$(1,179,267)**	**$(978,372)**	**$2,623,178**	**$379,138**	**$1,052,053**	**$1,896,730**

*WBIF amount may change and is subject to legislative approval

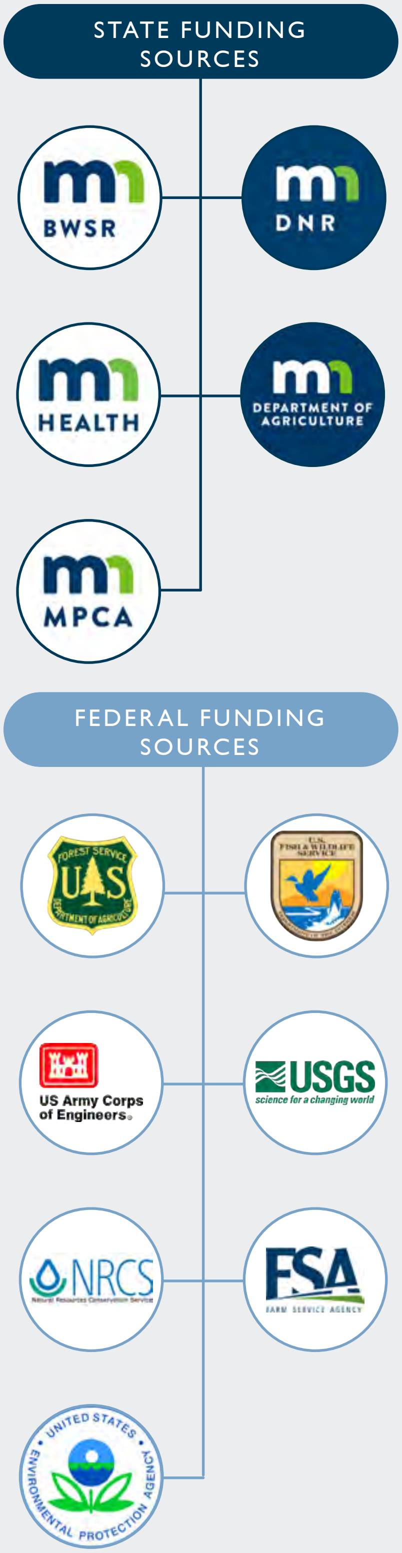
**Includes secured funding for targeted habitat projects

Local Funding

Local funds may include general funds, landowner contributions, or those which are derived from the local tax base, including in-kind contribution of personnel whose position is funded through locally derived funds. Local funds will be used to fund local priorities and programs such as when these local priorities are misaligned with state or federal funded program requirements as well as to provide required or additional match for grant programs. A listing of some of the funding mechanisms will be explored as appropriate. Table 6.2 below shows applicable local funding sources as identified in the *BWSR One Watershed, One Plan Guidebook.*

Table 6-2: Potential Local Funding Sources and Opportunities

CITATION	APPLIES TO	SUMMARY
§103B.245	Watershed districts	May establish a watershed management tax district within the watershed to pay the costs of: planning required under §§103B.231 and 103B.235, the capital costs of water management facilities described in the capital improvement program of the plans, and normal and routine maintenance of the facilities.
§103B.251	Watershed districts, counties	May certify for payment by the county all or any part of the cost of a capital improvement contained in the capital improvement program of plans developed in accordance with §103B.231. Counties may issue general obligation bonds to pay all or part of the cost of project. The county may pay the principal and interest on the bonds by levying a tax on all property located in the watershed or subwatershed in which the bonds are issued. Loans from counties to watershed districts for the purposes of implementing this section are not subject to the loan limit set forth in §103D.335
§103E.601	Drainage Authorities	Drainage System Costs: Funding of all costs related to construction, maintenance, and improvement of drainage systems is apportioned to property owners within the drainage system based on the benefits received from the improved drainage.
§103E.011 Subdivision 5		External Sources of Funding: A drainage authority can accept and use funds from sources other than assessments from benefited landowners for the purposes of flood control, wetland restoration, or water quality improvements. Additionally, 103E.015, Subd.1a requires drainage authorities to investigate potential use of external funding for the purposes identified in 103E.011, Subdivision 5.
§103B.331 Subdivisions 3 and 4	Counties	(3) May charge users for services provided by the county necessary to implement the local water management plan. (4) May establish one or more special taxing districts within the county and issue bonds to finance capital improvements under the Comprehensive Local Water Management Act. After adoption of the resolution, a county may annually levy a tax on all taxable property in the district.
§103B.555 Subdivisions 1 and 3		(1) May establish a Lake Improvement District and impose service charges on the users of lake improvement district services within the district. May levy an ad valorem tax solely on property within the lake improvement district for projects of special benefit to the district; may impose or issue any combination of service charges, special assessments, obligations, and taxes. (3) A tax under Subdivision 1 may be in addition to amounts levied on all taxable property in the county for the same/similar purposes.
§103B.355		Water Planning Authority for Special Projects: Counties have authority to levy funds for priority projects and to assist SWCDs with program implementation.
§103C.331 Subdivision 16	County boards on behalf of soil and water conservation districts	May levy an annual tax on all taxable real property in the district for the amount that the board determines is necessary to meet the requirements of the district.
§462.358 Subdivision 2b(c)	Municipalities	May accept a cash fee for lots created in a subdivision or redevelopment that will be served by municipal sanitary sewer and water service or community septic and private wells. May charge dedication fees for the acquisition and development or improvement of wetlands and open space based on an approved parks and open space plan.
§444.075		Stormwater Utility Fee: Municipalities (home rule charter or statutory city that is not in an orderly annexation process) are authorized to collect stormwater utility fees to build, repair, operate, and maintain stormwater management systems. Stormwater utility fees must be set using reasonable calculations based on runoff volume or pollution quantities, property classification, or an equitable basis.



State Funding

The state of Minnesota funds watershed management programs through various capacities, programs, and agencies. The Nonpoint Priority Funding Plan outlines a criteria-based process to prioritize Clean Water Fund investments. These high-level state priority criteria include:

1. Restore those waters that are closest to meeting state water quality standards,
2. Protect those high-quality unimpaired waters at greatest risk of becoming impaired, and,
3. Restore and protect water resources for public use and public health, including drinking water.

Funding for capital improvement projects may be obtained through legislative appropriations directly or through state agency programs that have bond funds available, such as RIM. Grants are also available from BWSR, the MPCA, MNDNR, MDH, and MDA to fund programs, practices, and projects. Grants are also available through legislative commissions, such as the Lessard-Sams Outdoor Heritage Council which funds habitat projects, and the Legislative and Citizens Commission on Minnesota Resources Environmental Trust Fund, which funds research and innovation funds. State revolving fund loans can be obtained from the MPCA and MDA. The state funding sources listed above will be pursued during implementation of this Plan to fund projects identified in the lower funding tiers in the implementation table.

Federal Funding

Federal agencies expected to partner and from which funds will be sought include USFS, USFWS, USACE, USGS, NRCS, FSA, and EPA. Dam improvement programs that address habitat and connectivity concerns may involve partnering with USACE. USGS will likely provide support for data acquisition and monitoring programs while USFWS may provide land retirement program funds.

Non-regulatory Ecosystem Service Programs and Trading Opportunities

Most ecosystem service trading programs are currently facilitated through regulatory permits and programs, such as wetland banking. However, demand is increasing to provide ecosystem service grants that are not regulatory in scope. Funding initiatives that may be available might focus on increasing or protecting habitat for particular species, such as endangered or threatened species, or for increasing or protecting habitat for a particular ecosystem, such as increasing habitat for pollinators. Funders of these programs could come from federal, state, nonprofits, or foundations.

Additional market-based trading options may be made available during the planning period through a pilot water quality trading management plan that was recently finalized for the City of Albert Lea (RESPEC et al, 2021). This project developed the framework for a trading program for the City's MS4 permit. The program framework is not yet adopted, but if it is put into place during the planning time frame it would add an additional funding opportunity. Landowners in the Fountain Lake drainage area would be able to secure funds by implementing BMPs that reduce TP leaving their property and generating credits that the City would purchase.

Other Funding Sources

Foundations, nonprofit organizations, and private contributions including landowners and corporate entities will be sought for Plan implementation activities. Local foundations may fund education, civic engagement, and other local priority efforts. Several conservation organizations are very active in Minnesota, such as The Nature Conservancy, the Audubon Society, and Minnesota Deer Hunters Association. These organizations acquire funding of their own and may have project dollars and technical assistance that can be leveraged. Finally, major cooperators and funding sources are private landowners who typically contribute 25 percent of project costs and may donate land, services, or equipment for projects or programs.

Collaborative Grants

The Plan JPC staff will develop grant applications and seek funding from various governmental and nongovernmental agencies based on the work plan. Individual entities will continue to submit grant applications for their existing programs and activities. However, grants that focus exclusively on implementing the activities of this Plan will be developed and submitted by the parties implementing the Plan.

Potential funding sources (excluding the WBIF grant) for implementing the Plan and the types of activities supported by each source are outlined in Table 6.3.

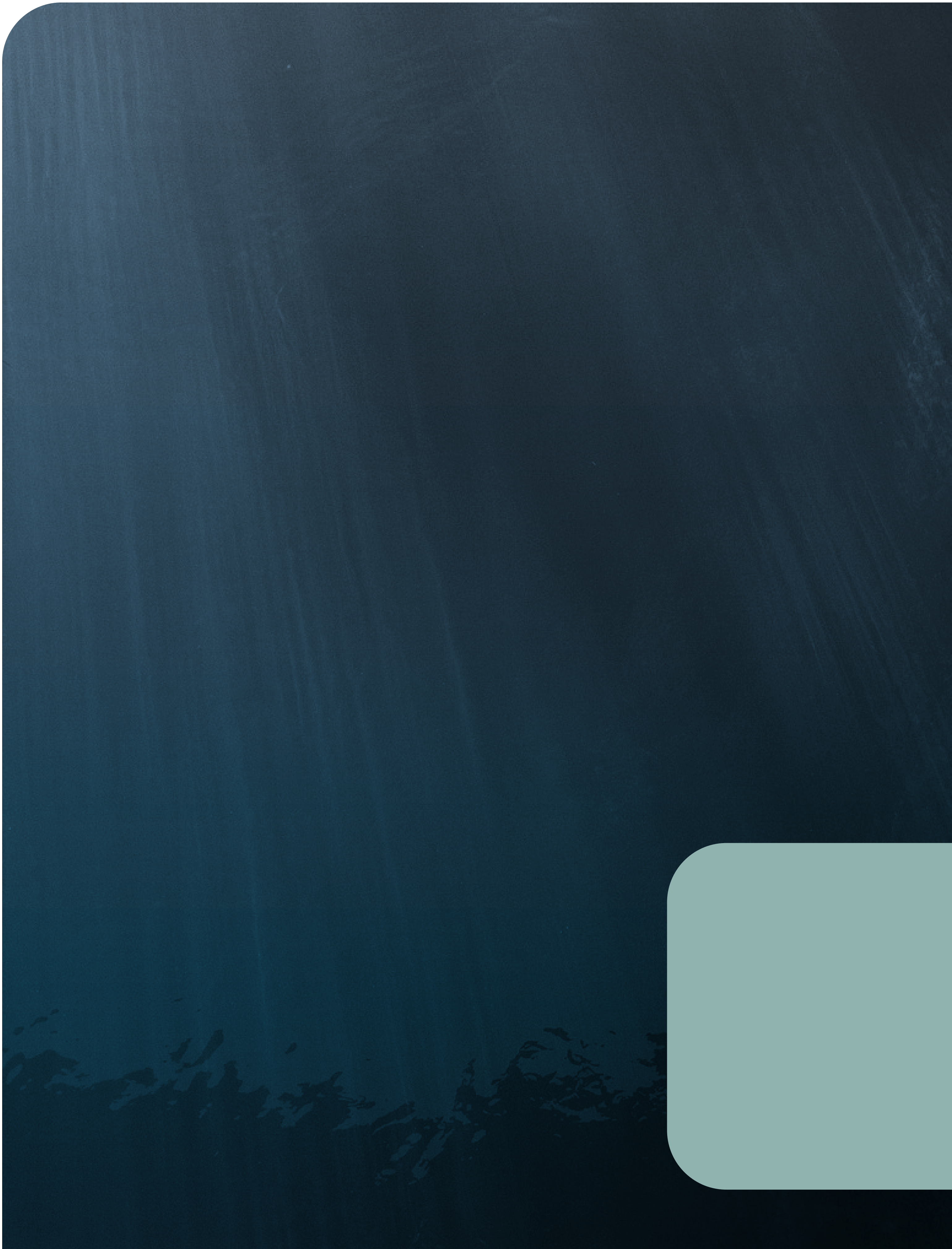
OTHER FUNDING SOURCES

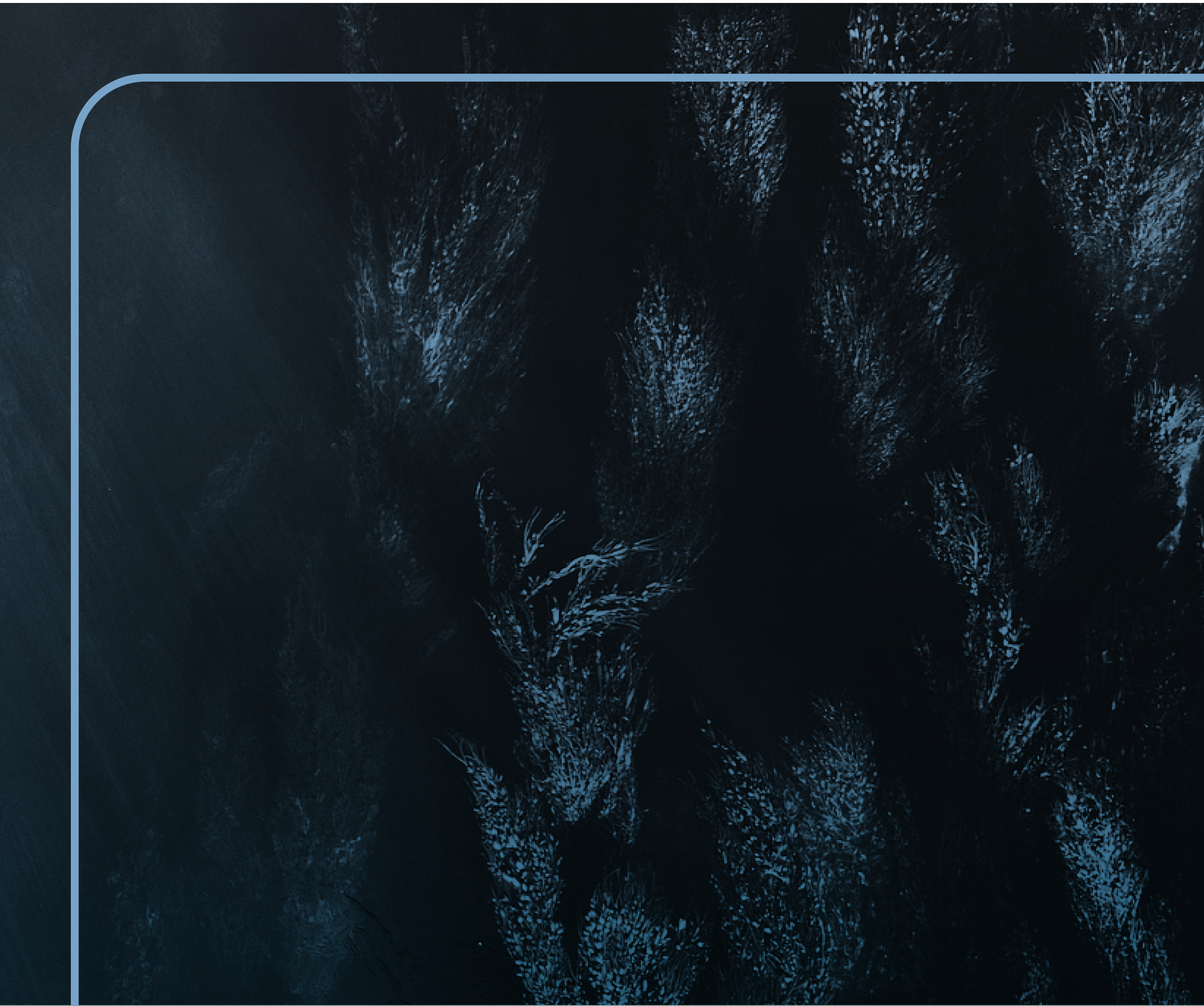
Table 6-3: Potential Grant Funding Sources

SOURCE	ORGANIZATION	PROGRAM/FUND NAME	TYPE OF ASSISTANCE	FORM OF ASSISTANCE	PROGRAMS: Conservation	PROGRAMS: Land Use Management	PROGRAMS: Monitoring, Data Acquisition, Studies	PROGRAMS: Education and outreach
STATE FUNDING	BWSR	Clean Water Fund	Financial	Grant	•			
		RIM		Easement	•			
		NRBG		Grant		•	•	•
		SWCD Local Capacity Service Grants		Grant	•	•	•	•
		Erosion Control and Management Program State Cost Share Program		Grant	•			
	DNR	Conservation Partners Legacy	Financial	Grant	•			
		Aquatic Invasive Species Control	Financial/Technical	Grant				•
		Forest Stewardship Program	Technical	Cost Share	•			
		Aquatic Management Area, Wildlife Management Area, Scientific and Natural Area	Financial	Fee Title Acquisition	•			
	DNR/Revenue	Sustainable Forest Incentive Act	Financial	Tax Incentive	•			
	MPCA	Clean Water Partnership	Financial	Loan	•			
		State Revolving Fund		Loan	•			
		Surface Water Assessment Grant (SWAG)		Grant			•	
	MDH	Source Water Protection Grant	Financial	Grant	•			
		Nitrate Testing	Technical	Monitoring			•	
	MDA	Ag BMP Loan Program	Financial	Loan	•			
		Minnesota Ag Water Quality Certification Program (MAWQCP)	Financial/Technical/Regulatory	Grant, Technical Assistance, Regulatory Certainty	•	•		
	LSOHC	Outdoor Heritage Funds	Financial	Grant	•			
	LCCMR	Environmental Trust Fund	Financial	Grant	•		•	•
	Legislature	Bonding	Financial	Bond	•			

Table 6-3: Potential Grant Funding Sources

Source	Organization	Program/Fund Name	Type of Assistance	Form of Assistance	Programs: Conservation	Programs: Land Use Management	Programs: Monitoring, Data Acquisition, Studies	Programs: Education and outreach
Federal Funding	FSA	Conservation Reserve Program (CRP)	Financial	Cost Share	•			
Federal Funding	FSA	Grassland Reserve Program	Financial	Cost Share	•			
Federal Funding	NRCS	Conservation Innovation Grant	Financial	Grant	•		•	•
Federal Funding	NRCS	EQIP	Financial	Cost Share	•			
Federal Funding	USGS	Stream Gaging Network	Technical	Monitoring			•	
Federal Funding	USACE	Planning Assistance	Technical	Planning			•	
Federal Funding	EPA	State Revolving Fund	Financial	Loan	•			
Other Funding	Ducks Unlimited		Financial/Technical	Easement/ Cost Share	•			
Other Funding	Trout Unlimited		Financial/Technical	Easement/ Cost Share	•			
Other Funding	The Nature Conservancy		Financial	Easement	•			
Other Funding	Minnesota Land Trust		Financial	Easement	•			
Other Funding	Pheasants Forever		Financial		•			





CHAPTER 7.0
REFERENCES

7.0 REFERENCES

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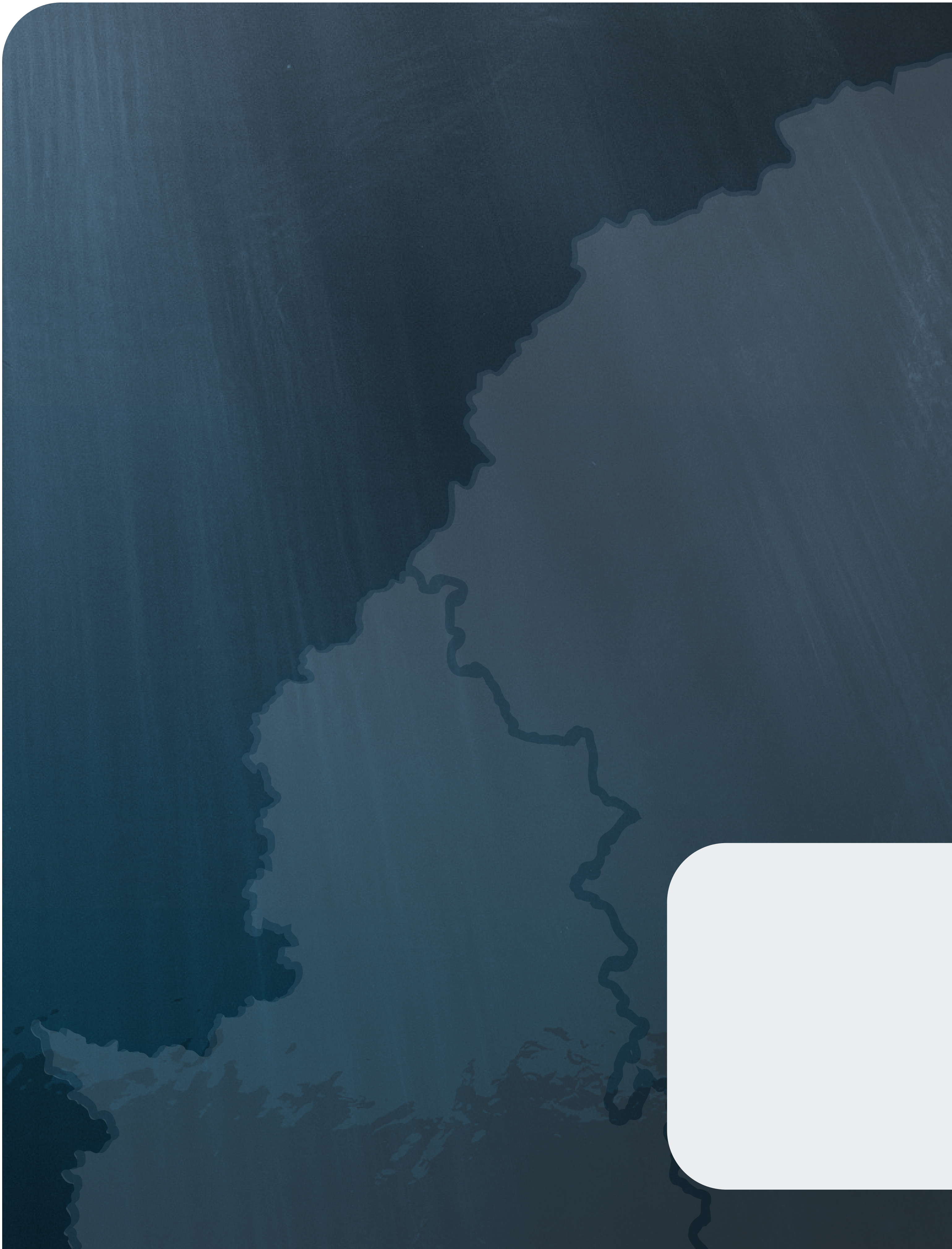
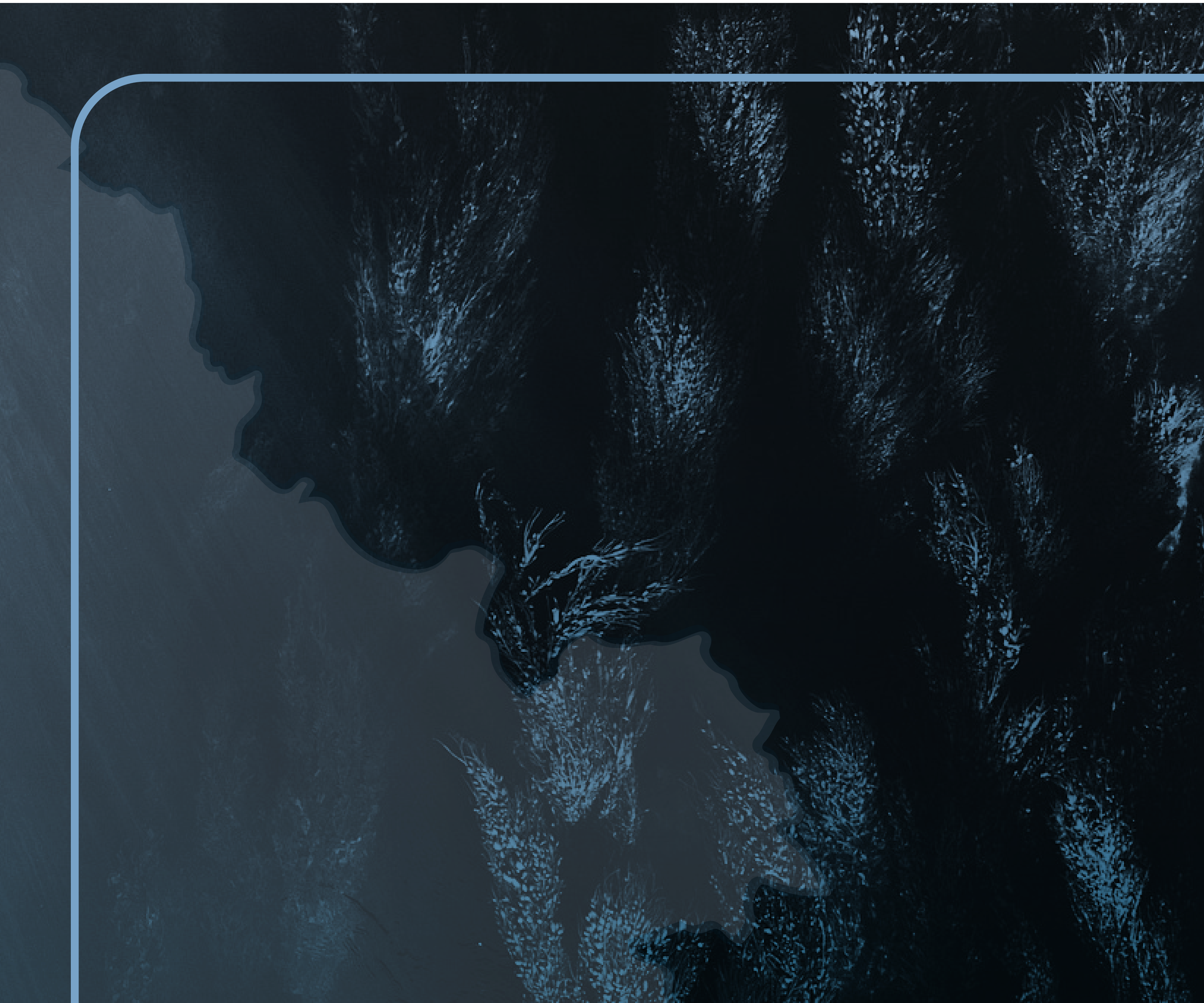




APPENDIX A
COMMITTEE MEMBERS

APPENDIX A: COMMITTEE MEMBERS

ADVISORY COMMITTEE MEMBERS

MEMBER ORGANIZATION	AUTHORIZED REPRESENTATIVE
Albert Lea Angers	Julia Thompson
Albert Lea Visitor and Convention Bureau	Holly Karsjens
Audobon Society	Rick Mammel (member)
Lakes Foundation	Laura Cunningham
MDA	Margaret Wagner
	Jeff Berg
DNR	Barbara Wiesman
	Robb Collett
	Daniel Girolamo
MDH	Carrie Raber
	Jennifer Ronnenberg
MPCA	Juline Holleran
	Emily Zanon
BWSR	Ed Lenz
	Dave Copeland
	Shaina Keseley
Shell Rock River Watershed District	Courtney Phillips
	Andy Henschel
Faribault Soil and Water Conservation District	Nathan Carr
Freeborn County	Rachel Wehner
Albert Lea-Freeborn County Chamber of Commerce	Shari Jenson
Freeborn County Drainage Authority	Cody Fox
Freeborn County SWCD	Brenda Lageson
	Chad Billat
Freeborn County Highway Department	Dillon Kubiatowicz
City of Albert Lea	Steve Jahnke
	Dalton Syverson
	*Phil Wacholz
Environmental Quality Board	Erik Dahl
Stakeholders	Rachel Christianson
	Bill Howe
	Terry Gjersvik
	Mark Morreim
	Don Yost

*Left for county position during planning process

POLICY COMMITTEE MEMBERS

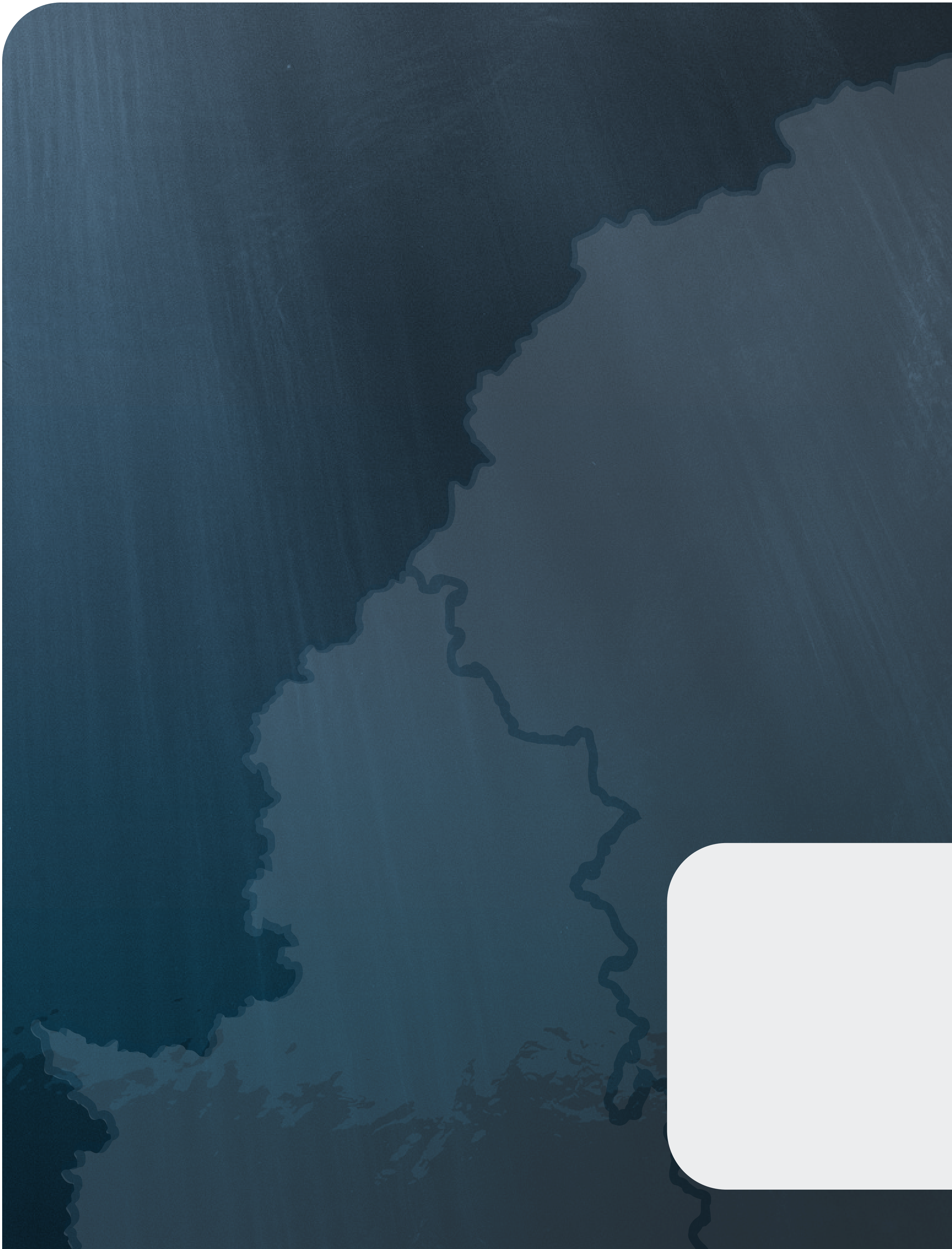
LGU	AUTHORIZED REPRESENTATIVE
Freeborn County	Ted Herman
Freeborn County	*Mike Lee
Shell Rock River Watershed District	Mick Delger
Freeborn County SWCD	Dave Ausen
City of Albert Lea	Larry Baker

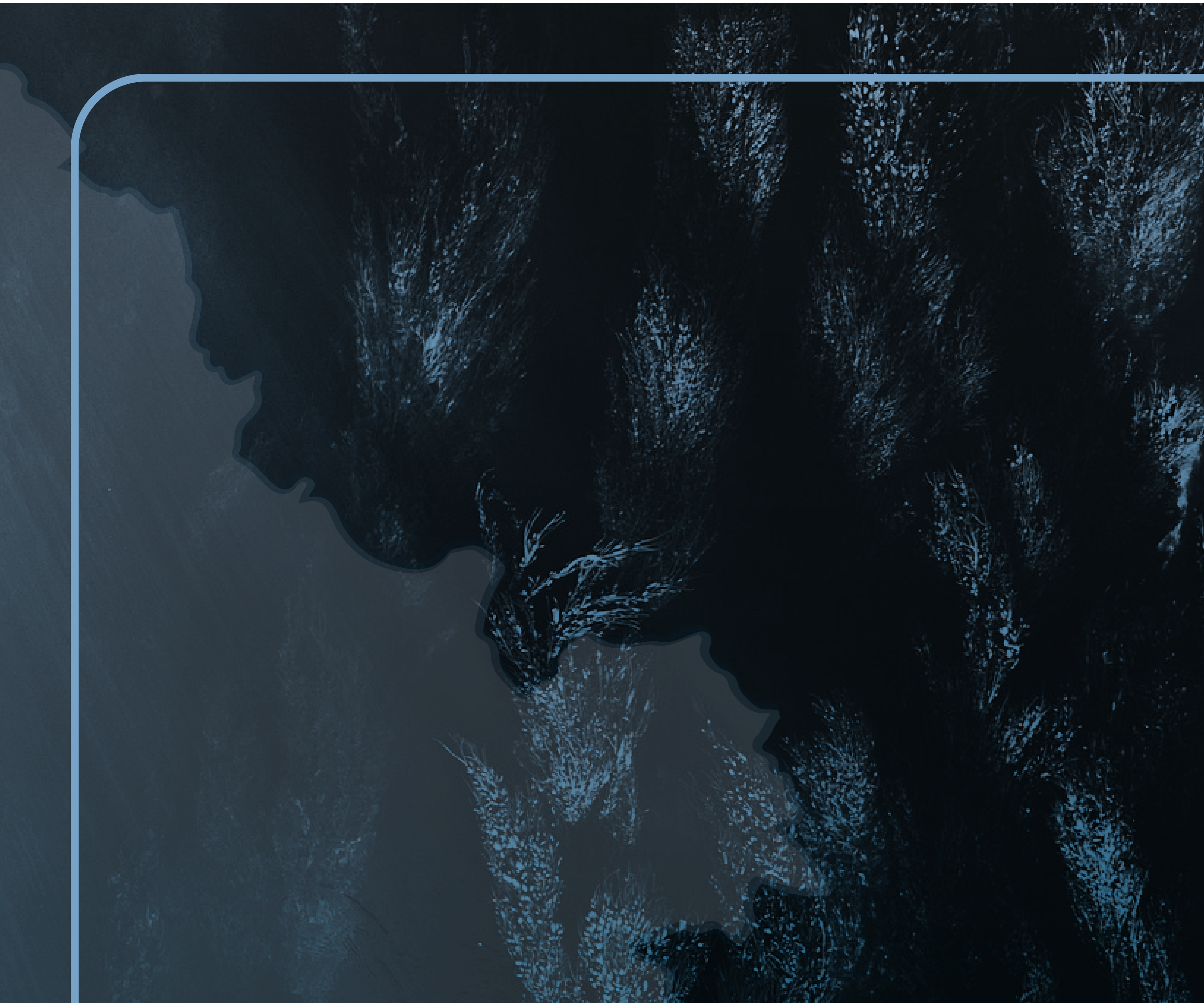
*Term ended in 2020 and was replaced by Ted Herman

STEERING COMMITTEE MEMBERS

MEMBER ORGANIZATION	AUTHORIZED REPRESENTATIVE
Shell Rock River Watershed District	Courtney Phillips
	Andy Henschel
Freeborn County	Rachel Wehner
Freeborn County SWCD	Brenda Lageson
	Chad Billat
City of Albert Lea	Steve Jahnke
	Dalton Syverson
	*Phil Wacholz
BWSR	Dave Copeland
	Shaina Keseley

*Left for county position during planning process





APPENDIX B
OFFICIAL COMMENT LETTERS

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
South Region Headquarters
21371 State Hwy 15
New Ulm, MN 56073

May 29, 2019

Shell Rock River Watershed District
Courtney Phillips
214 West Main St.
Albert Lea, MN 56007

Dear Ms. Phillips,

I am writing on behalf of the Minnesota Department of Natural Resources (DNR) and Commissioner Sarah Strommen to express our support and share our priorities for developing a Comprehensive Watershed Management Plan for Shell Rock - Winnebago watersheds. Thank you for your efforts and for consideration of our input.

I have attached what we see as keys to protecting and improving the health of the watershed. Addressing these priorities will help sustain water resources in ways that enhance the quality of life for all who live, work and enjoy the outdoors in this watershed.

The DNR is excited to supply scientific data and information related to the attached priorities. We also offer services that can strengthen the planning process. For example, we can help stakeholders get to know the watershed, or lead interactive exercises to help local partners explore water resource values.

Our lead staff person for this One Watershed One Plan (1W1P) project is Dan Girolamo, DNR Area Hydrologist, based in Waterville. Please contact Dan at (507) 362-8778 or daniel.girolamo@state.mn.us for more information about the attached priorities or the types of technical support we can provide.

As DNR Regional Director, I am committed to ensuring local DNR staff are organized to support 1W1P planning efforts and the resulting implementation plans. We greatly value the opportunity to contribute to the process and hope the information we provide is helpful. Please feel free to contact me with any natural resource issues.

Sincerely,

Scott W. Roemhildt
DNR South Regional Director

ec: Dan Girolamo- Area Hydrologist, Robb Collett – EWR South Region Manager, Barbara Weismann – Clean Water Coordinator, Dave Copeland – Board Conservationist, Cathi Fouchi – Regional Planner, Brooke Hacker – Clean Water Specialist, Tara Latozke – Fish Habitat Specialist, Brandon Eder - Asst. Area Wildlife Manager, Joe Brown – Forestry Supervisor, Corrie Floyd – Research Scientist 2, Neil Slifka – Parks and Trails

Minnesota Department of Natural Resources • Southern Region Headquarters
21371 State Hwy 15, New Ulm, MN 56073

Representatives from each of the DNR's divisions compiled a list of target areas and implementation activities. The priorities listed below, in no specific order, are priorities and issues we believe should be addressed in this Comprehensive Watershed Management Plan. As a team, we looked for issues and opportunities that provide multiple benefits towards watershed protection and improvement. We are committed to this process and can bring more robust information to the table as needed.

Resource	Priority Resource Concerns & Opportunities
Recreation/Access - Add and enhance public or protected lands and improve access to them.	**Issue:** Public lands are limited in the watershed and access to these properties should be enhanced. Several recreation access projects are underway within the watershed. Focus is needed to complete these ongoing projects while adding public access on resources that that lack such an access. • **Opportunity:** The Blazing Star trail connection will be completed. This connection will allow trail users to enjoy the segment between Albert Lea and Hayward. This segment will also pass along the shoreline of Albert Lea Lake. • **Opportunity:** The State has designed a state water trail beginning at the headwaters of Fountain Lake to the southeast and the Iowa state line. The Shell Rock river segment at Juglans Woods Aquatic Management Area (AMA) is over-widened and shallow. Pending a future channel restoration, this collaborative restoration project will enhance the recreational resource, water quality, and aquatic habitat by narrowing, deepening and helping to stabilize the channel. • **Opportunity:** The watersheds include abundant public land resources allowing for a wide range of outdoor recreational activities and experiences. These water resources should be enhanced, protected and promoted to increase use by the public. There are also many archeological sites in and around the Myre-Big Island State Park. The plan should seek opportunities for more conservation easements and/or land acquisitions to preserve sensitive lands, critical habitat areas and to protect riparian corridors and natural shorelines.
Water Quality – Reduce nutrients and sediment loading to improve the biology, water chemistry, and	**Issue (1):** Current water quality conditions for both lakes and streams point to a need for significant land use changes to reverse the pollutant loading trends. Work to address water quality goals established in Watershed Restoration and Protection Strategies (WRAPS) and TMDLs to prevent future surface water quality impairments and groundwater contamination, improve fish habitat in lakes and streams, and promote the watershed's resilience to changing hydrology and climate, invasive species, and other stressors.

health of the watershed.

- **Opportunity:** Zoning and other land-use tools should recognize the need to protect prime agricultural ground. Conservation practices and other BMPs to reduce runoff are needed to mitigate land-use impacts. The plan should emphasize implementation projects and practices to address soil health and altered hydrology. Cover crops are an example of a practice that can increase soil nutrients while reducing runoff.
- **Opportunity:** Many opportunities exist to restore drained lake or wetland basins in both the Shell Rock and Winnebago watersheds to improve water quality and stabilize peak flows. Culverts, bridges, and other infrastructure is being impacted by changing hydrology in our streams and rivers. Failing streambanks are common throughout the watershed.

Issue (2): There are high priority lakes in the Shell Rock and Winnebago River watersheds that support significant fisheries. These lakes offer recreational resources, abundant native aquatic plant communities with high species diversity and improved water quality.

- **Opportunity:** Restoration measures are needed to improve the quality of public waters. Using drawdowns and other tools to improve habitat will enhance the resource value of the lakes, rivers and streams and will move toward meeting the water quality guidelines for water recreation and aquatic life.

  - Albert Lea Lake– (Impaired-Restoration) This shallow lake is recovering from decades of misuse. The lake is large with minimum structures but includes miles of undeveloped shoreline that will aid restoration efforts. Protection of the shore and implementing BMPs is important because this lake has a higher sensitivity to nutrient loading.
  - Fountain Lake – (Impaired-Restoration) This lake is currently being dredged. Restoration work in the contributing watershed must continue to reduce loading. Habitat improvements to minimize the in-lake phosphorus cycling should also be considered.
  - Bear Lake - (Impaired-Restoration) Bear Lake is stabilizing after initial restoration work. A new outlet structure allows management, but the watershed produces high flows and bounce water levels, aggravating the shoreline. This lake benefits from the existing significant undeveloped shoreline. Bear Lake has outstanding biological significance.
  - Halls Lake – (Restoration) This lake is considered a deep fresh water marsh with natural environment shoreland zoning. The lake is impacted by drainage but helps normalize those flows as they leave the lake. A DNR Wildlife Management Area

encompasses most of the lakeshore and includes a 10-acre designated old growth hardwood forest.

- Upper and Lower Twin Lakes - (Restoration) Upper (677 acres) and Lower Twin (480 acres) lakes are noted to have a high biological significance and will be improved after a planned pump station will allow managers more flexibility in achieving management on Upper and Lower Twin Lake uniquely.
- State Line Lake – (Restoration) This designated wildlife lake is experiencing prolonged periods of inundation. Water levels have remained high resulting in shore land erosion and low diversity in the basin. This lake is noted to have a moderate biological significance.
- Goose Lake - (Restoration) This 82 acre lake has been partially drained. The remaining basin represents about 1/3 of the historic basin. The basin drains west into Bancroft Bay on Fountain Lake.

- **Opportunity:** Protection or restoration measures are needed to maintain or improve the high public recreational and resource value of the streams and rivers that meet water quality guidelines for water recreation and fish consumption
  - Bancroft Creek – (Impaired – Restoration and Protection) Bancroft Creek, from County Ditch 63 to Fountain Lake, is impaired for aquatic recreation due to Escherichia Coli. There is also an impairment for invertebrate biological index (IBI). Restoration and protection strategies should focus on protecting and restoring the riparian zone.
  - Shell Rock River – (Impaired - Restoration). The Shell Rock River at Albert Lea Lake to Goose Creek is impaired for aquatic life due to turbidity, pH, nutrients and dissolved oxygen, as identified in previous aquatic macroinvertebrate bio-assessments and fishes bio-assessments. BMPs in the upper watershed along with filter strips and riparian protection will help. DNR is committed to assisting with stream restoration projects.
  - Winnebago River Watershed – (Restoration) The Winnebago River is entirely altered in Minnesota. Water storage projects in the upland and increasing floodplain connectivity could benefit channel stability because flows rarely leave the channel.

Invasive Species

Prevent the transport and spread of terrestrial and aquatic invasive species.

Issue: The Shell Rock and Winnebago watersheds are home to a variety of native species and invasive species, both terrestrial and aquatic. Fortunately, invasive species are not prevalent in the watersheds but educating the public about prevention strategies and threats should be a key strategy.

- **Opportunity:** Coordinate with local governments to implement their respective aquatic invasive species program. Activities completed under this program will inform the public and implement treatments to control undesirable aquatic plant species. Keeping curly-leaf pondweed and Eurasian watermilfoil to remain a minor problem in the watersheds is an important goal. Additionally, preventing invasive fish species from entering local lakes, such as invasive carp and yellow bass, are priorities for the DNR.
- **Opportunity:** Inform the public about documented invasive animal species that could cause problems. Chinese Mystery Snails are in Fountain and Albert Lea Lakes and pose minor problems. Zebra mussels are not currently in the watersheds.
- **Opportunity:** Inform the public about Purple Loosestrife and the problems associated with this terrestrial invasive.

Land Use Planning
Work with LGU staff to effectively implement the zoning code and manage drainage infrastructure.

Issue: Enhance the administration of the local shore land zoning ordinance so controls are implemented and the adjacent surface water resource is restored, enhanced or protected from development pressures.

- **Opportunity:** Review past zoning decisions that directly impact the surface water resources and discuss modifications that would do more to protect the resource.
- **Opportunity:** The DNR provides the Community-based Aquifer Management Partnership (CAMP) program to discuss water supply issues, infrastructure, and water availability considerations for decision making. Identify ground water monitoring needs and use trends.
- **Opportunity:** Expand outreach at a LGU/watershed level to better understand development pressures in the watersheds. Understanding development pressures near surface water resources will allow decision makers to influence development proposals to protect water resources.
- **Opportunity:** Drainage ditches and channelized streams make up the majority of watercourses in the Shell Rock and Winnebago watersheds. Changes in hydrology and fluctuating waters can degrade water quality, destabilize streambanks, and impact fish and other aquatic life. Consider mitigation and incorporate BMPs on drainage improvements that increase peak flows or volumes of

water drained. Utilize drainage repairs and spot clean outs rather than full scale cleanouts or improvements.

Protect and/or restore Native Landscapes, process and functions (Protect natural features and native communities) (Public Land Base)

Issue: Few native landscapes remain in the Shell Rock and Winnebago watersheds. Most of these native remnants are located on public lands, and therefore are managed by public entities, but some are located on private parcels. These native landscapes need protection and restoration work to maintain the public values and functions.

- **Opportunity:** Support ongoing local efforts focused on citizen engagement and promotional events that showcase area water resources.
- **Opportunity:** Interact with citizens to inform them about public lands and other recreational assets. Additional public parcels are controlled local and federal partners.

Outreach

Issue (1): Shallow Lakes – Those living in the watershed value the chain of shallow lakes in various ways. The common belief supports deep, clear water despite the negative consequences tied to striving for these attributes. Take advantage of opportunities to explain and interpret the natural attributes and associated values and ecological services provided by shallow lakes.

Issue (2): Citizen Engagement - Many active groups in the watersheds work to promote a high standard of living in Albert Lea. Water Resources play a large part of this high standard of living. Our vision embraces sustained resource use based on wise use, protection, and restoration.

- **Opportunity:** Support ongoing local efforts focused on citizen engagement and participation.
- **Opportunity:** Interact with citizens to engage them and align planning activities in the watersheds.
- **Opportunity:** Support ongoing local efforts focused on citizen engagement and participation.
- **Opportunity:** Interact with citizens to listen to expectations and share foundation of the department's shallow lakes program.

BOARD OF WATER AND SOIL RESOURCES

3555 9th Street NW, Suite 350
Rochester, MN 55901

June 20, 2019

Shell Rock River/Winnebago One Watershed, One Plan Partnership
C/O Courtney Phillips, Shell Rock River WD
214 West Main Street
Albert Lea, MN 56007

Re: Response to request for priority issues and plan expectations (One Watershed, One Plan)

Dear Courtney,

Thank you for the opportunity to provide priority issues and plan expectations for the development of the Shell Rock River/Winnebago Comprehensive Watershed Management Plan (plan) under Minnesota Statutes section 103B.801.

The Board of Water and Soil Resources (BWSR) has the following overarching expectations for the plan:

Process

The planning process must follow the requirements outlined in the One Watershed, One Plan Operating Procedures (Version 2.0), adopted by the BWSR Board on March 28, 2018. More specifically, the planning process must:

- Involve a broad range of stakeholders to ensure an integrated approach to watershed management.
- Reassess the agreement established for planning purposes when finalizing the implementation schedule and programs in the plan, in consultation with the Minnesota Counties Intergovernmental Trust and/or legal counsel of the participating organizations, to ensure implementation can occur efficiently and with minimized risk. This step is critical if the plan proposes to share services and/or submit joint grant applications.

Plan Content

The plan must meet the requirements outlined in One Watershed, One Plan – Plan Content Requirements (Version 2.0), adopted by the BWSR Board on March 28, 2018. More specifically, the plan must have:

- A thorough analysis of issues, using available science and data, in the selection of priority resource concerns.
- Sufficient measurable goals to indicate an intended pace of progress for addressing the priority issues.
- A targeted and comprehensive implementation schedule, sufficient for meeting the identified goals.
- A thorough description of the programs and activities required to administer, coordinate, and implement the actions in the schedule; including work planning (i.e. shared services, collaborative grant-making, decision making as a watershed group and not separate entities) and evaluation.

BWSR has the following specific priority issues:

- **The Nonpoint Priority Funding Plan** (NPFP) – The NPFP outlines a criteria-based process to prioritize Clean Water Fund investments. Planning partners intending to pursue Clean Water Fund dollars are strongly encouraged to consider the high-level state priorities, keys to implementation, and criteria for evaluating proposed activities in the NPFP.
- **Drainage** - The drainage authorities within the planning area should be included as stakeholders in the plan development process. This inclusion should ensure that the Chapter 103E processes and proceedings as well as the extent and the limitations of drainage authority responsibility are adequately included in the final plan. Additionally, the planning partners are strongly encouraged to include projects and activities consistent with multipurpose drainage criteria outlined in Minnesota Statutes §103E.011, Subd. 1a and §103E.015, Subd. 1. Refer to the attached document "Chapter 103E Drainage System Consideration for 1W1P" for additional information on 103E Drainage Authority responsibility, authority and opportunity for participating in the planning of conservation practices involving public drainage systems.
- **Lakes** – There are many lakes within the planning area that are valued for their recreational opportunities. All are considered shallow lakes by the Minnesota DNR's definition, and seven are currently listed as impaired for aquatic recreation by the MPCA. Due to their shallow nature and high phosphorus levels, BMPs that reduce phosphorus movement in the watershed and restoration efforts are important to help improve recreational opportunities and address re-suspension of that phosphorus throughout the open water season. Because of its location at the top of the watershed, Albert Lea Lake may be of particular concern.
- **Wetlands** – Protection and restoration of wetlands provides benefits for water quality, flood damage reduction, and wildlife habitat. The plan should support the continued implementation of the Wetland Conservation Act and look for opportunities to improve coordination across jurisdictional boundaries. The plan should also identify high priority areas for wetland restoration and strategically target restoration projects to those areas. The Restorable Wetland Prioritization Tool is an example resource that can be used to help identify such areas. The state is embarking on a new wetland prioritization plan that will guide wetland mitigation in the future. Wetland restoration and preservation priorities in this plan may be eligible for inclusion in this plan in the future. Please refer to the attached document "Shell Rock River and Winnebago 1W1P Wetland Section Comments" for further information on this program and additional considerations regarding wetlands.

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- **Conservation Easements** – The State's Re-Invest in Minnesota (RIM) Reserve easement program and the Conservation Reserve Enhancement Program (CREP), in partnership with the United States Department of Agriculture (USDA), considers several site specific and landscape scale factors when funding applications. Though it is dependent on specific program terms, the State considers local prioritization of areas for easement enrollment. The plan should take into account areas with a higher risk of contributing to surface and subsurface water degradation, such as highly erosive lands and wellhead protection areas that would benefit from being placed under permanent vegetative cover. Another factor to consider is that in the next 3 years (2019-2021) nearly 6,000 acres of Conservation Reserve Program (CRP) practices are scheduled to expire within the partnership's counties. The plan should recognize the potential impact these expiring contracts may have in the planning area and consider prioritizing working with producers regarding the management of those acres.
- **Landscape Resiliency and Climate Adaption** – BWSR strongly encourages your planning partnership to consider the potential for more extreme weather events and their implications for the water and land resources of the watershed in the analysis and prioritization of issues. The weather record for the planning area shows increased frequency and severity of extreme weather events, which has a direct effect on local water management. Adjustments involving conservation and fieldwork planning and implementation should be explored; for instance, the use of an updated precipitation frequency chart such as the NOAA Atlas 14 when designing conservation projects. An additional source of information for use in the planning process is the BWSR Landscape Resiliency Toolbox. Finally, a new white paper from the Minnesota Interagency Climate Adaptation Team titled "Building Resiliency to Extreme Precipitation in Minnesota" also provides resiliency strategies related to this topic.
- **Local Controls** - Gaps or inconsistencies in local ordinances, policies, or enforcement could affect the success of your plan's implementation. Redetermination of benefits on drainage systems, SSTS compliance inspection requirements (property transfer, variance, etc.), level 3 feedlot inventories, and shoreland regulations are some examples that should be explored during plan development.
- **Soil Health** – The majority of the land use in the Shell Rock and Winnebago River planning area is agriculture. The concept and the associated practices of soil health have the potential to positively change the interaction of agriculture and the natural system at the soil level. Common soil health practices include the use of reduce or no tillage, the use of cover crops, increased areas of continuous living cover, and extended crop rotations. Improving soil health can help decreased soil erosion, increase water infiltration, provide nutrient scavenging, and increase soil organic matter. In addition, there seems to be increased interest from landowners and operators about soil health. It is recommended that these soil health practices be prioritized for implementation in the plan.
- **Surface and Groundwater Quality** – BWSR believes degraded water quality, both surface and groundwater, are significant issues in the watershed. The plan should examine current efforts to address these issues, and examine listed impairments and their locations, as strategies are developed to improve both surface and groundwater quality. BWSR advocates for efforts that will focus on reducing pollutant sources before they reach water resources as a key component of an overall strategy. The GRAPS and WRAPS documents can help identify strategies for both groundwater and surface water, respectively.

  a. **GRAPS** - The Groundwater Restoration and Protection Strategies (GRAPS) for the Shell Rock and Winnebago River watersheds is currently under development by the MDH and will be available in the near future. This report will help identify specific groundwater issues in the planning area and

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ideas for implementation actions to address these issues. These ideas should be vetted by the planning group and a set of them should be incorporated in the plan.

b. **WRAPS** - The Watershed Restoration and Protection Strategies (WRAPS) for the Shell Rock River and Winnebago River Watersheds are currently in development by the MPCA. In the meantime, reports related to the development of the WRAPS should be reviewed and incorporated into your planning effort. These reports (the Monitoring and Assessment report and the Stressor Identification report) can be found here: Shell Rock and Winnebago.

- **Altered Hydrology/Flooding/Water Quantity** – The hydrologic conditions of the watersheds in this planning area have changed over time. In recent decades more precipitation, more runoff, and more runoff per unit of precipitation has been observed as well as more frequent periods of extremely low flow in some watercourses. These hydrologic changes as well as others have contributed to instability of natural and artificial watercourses, degradation of wetland habitats, loss of agricultural productivity, and increased the risk of flood damages. Recognizing altered hydrology as a priority issue in the plan will help ensure that a driving factor behind many related issues is directly addressed.
- **Protecting Pollinator Populations** - Projects should identify opportunities to benefit pollinator populations through creating areas of refuge and providing floral resources that can benefit a wide range of pollinators. Governor Walz recently signed a new Executive Order "Restoring Healthy, Diverse Pollinator Populations that Sustain and Enhance Minnesota's Environment, Economy, and Way of Life" that directs efforts of the Interagency Pollinator Protection Team. This team recently released a Minnesota State Agency Pollinator Report that outlines state agency priorities. There is also a BWSR Pollinator Toolbox that provides guidance for project planning, implementation and management. Invasive Species and Landscape Management: A cooperative approach across the watershed is recommended for invasive species management to address invasive species and weed issues across geographic and ownership boundaries. Invasive species should be prioritized based on their risk to ecosystems, agriculture, recreation, and human health. There should also be a focus on emerging weed threats such as Palmer amaranth that pose a significant risk to agricultural production. Adaptive management strategies should be used to address invasive species and also maintain ecological functions and services within landscapes.
- **Urban Stormwater/MS4s** – Urban stormwater runoff frequently contains pollutants such as pesticides, fertilizers, sediment, salt, and other debris, which can contribute to excess algae growth and poor water clarity/quality in our water resources. Poorly managed urban stormwater can also drastically alter the natural flow and infiltration of water, scour stream banks and harm or eliminate aquatic organisms and ecosystems. A Municipal Separate Storm Sewer System (MS4) General Permits is owned/operated by the city of Albert Lea within the planning area. This MS4s has accepted an invitation to be on the Policy Committee in the planning effort which should ensure that their Stormwater Pollution Prevention Programs are incorporated into the plan.
- **Data Collection and Monitoring** – A thorough review of existing data and monitoring is required as a component of the plan. Identification of data or monitoring needs can then be incorporated into implementation activities in order to help measure progress toward plan goals.

We commend the partners for their participation in the planning effort. We look forward to working with you through the rest of the plan development process. If you have any questions, please feel free to contact us via email at david.copeland@state.mn.us or shaina.keseley@state.mn.us , or via telephone at (507-206-2891).

Sincerely,

Dave Copeland

Dave Copeland, *Board Conservationist*

Shaina Keseley, *Clean Water Specialist*

Attachments: Chapter 103E Drainage Systems Considerations For One Watershed, One Plan
Shell Rock River and Winnebago River 1W1P Wetland Section Comments

cc: Julie Blackburn, RESPEC Consulting (via email)
Shell Rock River/Winnebago One Watershed, One Plan Partnership (via email)
Ed Lenz, BWSR (via email)
Barbara Weisman, Dan Giralamo and Robb Collett, DNR (via email)
Margaret Wagner and Jeff Berg, MDA (via email)
Carrie Raber and Jennifer Ronnenberg, MDH (via email)
Juline Holleran and Emily Bartusek, MPCA (via email)

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Chapter 103E Drainage Systems Considerations

For

One Watershed, One Plan

As the 1W1P plan is formulated, BWSR suggests the following:

- Chapter 103E drainage authorities (who are also water planning authorities) be fully engaged from the early stages of the planning process. Use Section 103E.015 *CONSIDERATIONS BEFORE DRAINAGE WORK IS DONE* and other provisions of drainage law identified below to capture both the extent and limitations of drainage authority responsibility, authority and opportunity for participating in the planning and implementation of conservation practices involving public drainage systems and their associated drainage areas.
- Prioritization within the watershed include identification of Chapter 103E drainage systems and their drainage areas.
- Multipurpose drainage management be included in the approach for targeting best management practices (BMPs) within the drainage area of Chapter 103E drainage systems, considering the five purposes outlined in Section 103E.015, Subdivision 1. *Environmental, land use, and multipurpose water management criteria*, clause (2).
- Measurable outcomes for erosion and sediment reduction, nutrient reduction, improved instream biology, and detention storage to assist those outcomes, should include correlation to Chapter 103E drainage systems.
- Lay out a coordinated approach for how implementation of multipurpose drainage management practices identified in the plan can be coordinated with, and/or integrated early into Chapter 103E processes and proceedings. When projecting funding needs for BMP implementation along, or within the drainage area of, public drainage systems, incorporate use of the following Sections of Chapter 103E.
    - 103E.011, Subd. 5. *Use of external sources of funding.*;
    - 103E.015, Subd. 1a. *Investigating potential use of external sources of funding and technical assistance.*;
    - 103E.227 *Impounding, rerouting and diverting drainage system waters.*;
    - 103E.701, Subd. 6. *Wetland restoration and replacement; water quality protection and improvement.*; and
    - 103E.715, Subd. 6. *Repair by re-sloping ditches, incorporating multistage ditch cross-section, leveling spoil banks, installing erosion control, or removing trees.*

  These provisions enable public-private funding partnerships involving Chapter 103E drainage systems.
- Drainage authorities consider the permissive authority in Section 103E.021 Subd. 6 *Incremental implementation of vegetated ditch buffer strips and side inlet controls.* To establish permanent buffer strips of perennial vegetation and/or side inlet controls, where necessary to control erosion and sedimentation, improve water quality, or maintain the efficiency of the drainage system.
- Note that in accordance with Section 103E.021, Subdivision 1. *Spoil banks must be spread and permanent vegetation established.*, a drainage authority shall order minimum 16-1/2 ft. wide ditch buffer strip(s) of perennial vegetation approved by drainage authority for any proceeding to establish, construct, improve or do any work affecting a public drainage system under any law that appoints viewers to assess benefits and damages.

BOARD OF WATER AND SOIL RESOURCES

Date: 6/10/2019

To: D. Copeland, Board Conservationist

From: T. Smith, Wetland Section

RE: Shell Rock and Winnebago River 1W1P Wetland Section Comments

The Wetlands Section at BWSR is initiating a process to develop compensation planning frameworks (CPF) for each bank service area (BSA) in Minnesota. Work on the plan for BSA 8, which the Shell Rock and Winnebago Rivers are part of, has not begun and is not scheduled to begin until 2021 at the earliest. When completed, the CPF will assess baseline conditions and cumulative impacts to wetlands, identify watershed scale trends, and, utilizing stakeholder input and other watershed information, formulate a strategy for identifying and prioritizing wetland restoration opportunities. For the baseline condition section we typically include the following watershed characteristics: pre-settlement vegetation, wetlands, lakes, watercourses, water quality, land cover, perennial cover and impervious surface, sensitive species and plant communities, Clean Water Act Section 404 permitting analysis, and aquatic resource loss. To the extent that these characteristics are assessed in the 1W1P process they will benefit our CPF development in the future. The Wetland Section may also be able to assist with compiling information on the current extent of wetlands in the watershed and assessing the amount of cumulative loss if the planning team is interested in this information. Our specific comments on the planning process for the Shell Rock River/Winnebago 1W1P are provided below.

- If wetland restoration projects become part of a local implementation plan they should be focused on restoring, to the greatest extent practicable, pre-disturbance conditions with respect to hydrology and vegetation. Restoration projects that are focused on a single function or service should be less of a priority than those that focus on the suite of functions provided by these resources. Also, restoration efforts should attempt to restore self-sustaining systems that are not reliant on structures and/or routine management and operation.
- The Shell Rock and Winnebago River watersheds, and the larger BSA 8, currently have a low supply of wetland bank credits. This is true both for the general public and the Local Government Road Wetland Replacement Program (LGRWRP). The low balance of credits could result in replacement for wetland impacts being exported out of the watershed which further reduces the ability of the landscape, and wetlands in particular, to perform functions at even a basic level. Through the CPF development process BWSR intends to identify priority areas where future wetland restorations would have the highest potential for success and also the greatest potential benefit to the watershed. This process could work closely with the 1W1P process to take advantage of these comprehensive planning efforts and identify wetland restoration priority areas that address multiple watershed management objectives.

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In summary, the 1W1P participants, through their planning process, have the opportunity to contribute to, and benefit from, the CPF development. If there is interest in discussing opportunities to share data, coordinate baseline condition assessments, and take advantage of stakeholder input processes please do not hesitate to contact me or Mr. Dennis Rodacker of my staff.

DEPARTMENT OF AGRICULTURE

June 20, 2019

Courtney Phillips
Shell Rock River Watershed District
214 West Main St.
Albert Lea, MN 56007
507-379-8782
courtney.phillips@co.freeborn.mn.us

Dear Ms. Phillips

Thank you for the opportunity to provide priority issues for consideration in the development of the Shell Rock River and Winnebago River One Watershed One Plan (1W1P). The Minnesota Department of Agriculture (MDA) looks forward to working with local government units, stakeholders, and other agency partners in the planning process.

The mission of the MDA is *"to enhance Minnesotans' quality of life by ensuring the integrity of our food supply, the health of our environment, and the strength of our agricultural economy."* and the mission of the Pesticide and Fertilizer Management Division is *"To serve and protect the citizens of Minnesota and the state's agriculture, through technical assistance, certification, and regulation."*

To fulfill our mission, the MDA role in the 1W1P process is to work with local government, the agricultural community and other stakeholders in the watershed planning process to provide technical assistance on agricultural and water quality topics. The MDA maintains a variety of water quality programs including research, on-farm demonstrations, groundwater and surface water monitoring, and the Minnesota Agricultural Water Quality Certification Program. Our goal is to provide you with MDA program information which we hope is helpful to further understand the resource concerns and engage the agricultural community in local problem solving.

Minnesota Department of Agriculture Priority Concerns

Nitrates and pesticides in groundwater are the priority resource concerns for the MDA statewide. In the Shell Rock River and Winnebago River watershed, MDA has limited data to suggest this is a concern in the watershed (See monitoring data below). However even though data may be currently limited, the programs and practices that address groundwater quality, may also provide surface water and other environmental benefits as well. The MDA's and other on-farm research and demonstration programs can help provide information that can be utilized locally in implementation of the 1W1P. Specifically, they can help address several of the priority concerns, measurable goals, incentive programs, and help with the watershed public participation and education programs in the plan. These programs can help address water quality concerns to support farmer-led discussion and peer-to-peer learning (Ex. establishment of soil health teams, field days, demonstration plots, networking/advisory groups, etc.). Engaging farmers and crop advisers in a trusted relationship is essential for making on–farm decisions in the agricultural areas of the watershed.

The MDA is interested in working with local and state partners to engage the agricultural community, support on-farm demonstrations, promote the Minnesota Agricultural Water Quality Certification Program, and use the most recent and relevant research and tools to share information about soil health, cover crops and other conservation practices. The following is a list of pertinent activities, datasets, resources, and MDA programs specific to the Shell Rock River and Winnebago River Watersheds. Please consider these activities and resources in the 1W1P development process. We look forward to working with the Shell Rock River and Winnebago River 1W1P team to discuss how these priorities may fit into actions in the Plan.

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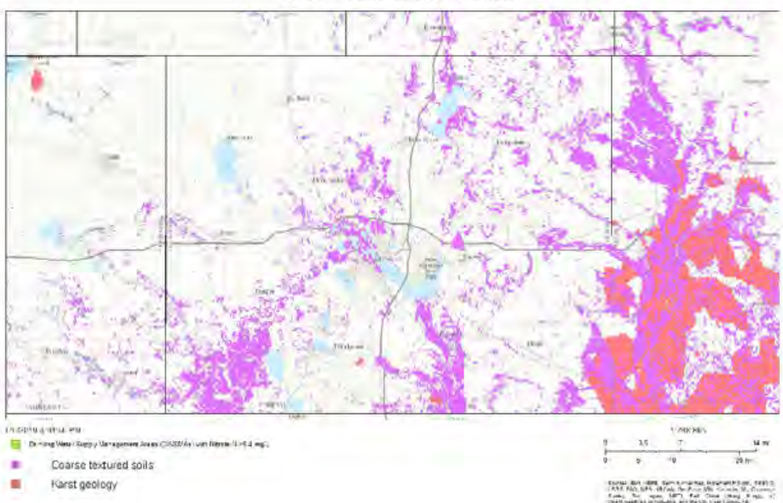
Nitrogen Fertilizer Management Plan (NFMP)
The NFMP is the state's blueprint for preventing or minimizing the impacts of nitrogen fertilizer on groundwater. The primary goal of the NFMP is to involve local farmers and agronomists in problem-solving to address elevated levels of nitrate in groundwater. The original plan was developed in 1990 and recently was updated in March 2015. The purpose of the NFMP is to prevent, evaluate and mitigate nonpoint source pollution from nitrogen fertilizer in groundwater. The NFMP includes components promoting prevention and developing appropriate responses to the detection of nitrogen fertilizer in groundwater. Nitrogen BMPs are the cornerstone of the NFMP. Some of these prevention, monitoring and assessment, and mitigation activities are further discussed below. In addition to program information discussed below, the NFMP identifies alternative practices that can be used to address nitrate in groundwater (called alternative management tools (AMTs)). These AMTs which are intended to prevent and mitigate nitrate in groundwater are the same/similar practices that provide additional water quality benefit that may be applicable in the Shell Rock River and Winnebago watersheds as well. This includes such things as; precision agriculture, perennial crops and cropping systems, cover crops, and other soil health practices. The NFMP also includes formation of local advisory teams made up of farmers and the community to discuss and address local nitrate in groundwater issues. The Nitrogen Fertilizer Management Plan is available at: www.mda.state.mn.us/nfmp

Township Testing Program (TTP)
As part of the NFMP, the MDA designed the Township Testing Program (TTP) to determine current nitrate-nitrogen concentrations in private wells within areas that are vulnerable to groundwater contamination. The below map illustrates coarse textured soils and karst geology which are features identified as vulnerable area.

DRAFT Vulnerable Groundwater



In the summer of 2019, one township in the Shell Rock River and Winnebago Watershed will be tested for nitrate in private wells through the township testing program. All homeowners on private wells in Mansfield Township will be offered a free nitrate test kit in the mail.

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After results have been compiled, additional information will be available at:
www.mda.state.mn.us/townshiptesting

Proposed Groundwater Protection Rule

The proposed Groundwater Protection Rule was developed by the MDA with significant stakeholder engagement over the past several years. Scheduled to go into effect in 2020; one of the impacts in the Shell Rock River and Winnebago Watershed will be the prohibition of fall and frozen soil application of nitrogen fertilizer in vulnerable groundwater areas and DWSMAs with wells with high nitrate. The MDA has developed a draft vulnerable are map which illustrates the areas where the fall and frozen soils prohibition will apply. This map will be updated in January annually, and the current interactive map can be found at:
https://mnag.maps.arcgis.com/apps/webappviewer/index.html?id=47a342afe6654640b935c8e76023da92

Private Well Pesticide Sampling (PWPS)

The MDA began evaluating pesticide presence and magnitude in private residential drinking water wells as part of the Private Well Pesticide Sampling (PWPS) Project in 2014 as a companion program to the MDA Township Testing Program (TTP). Townships in different counties have been, and will continue to be, sampled every year until the project concludes in 2020. Townships in the PWPS depend on the participation of well owners and may not reflect all of the townships sampled in the TTP. Water samples are collected by trained MDA hydrologists and analyzed by a private contract lab for compounds similar to the MDA ambient water quality monitoring program. The PWPS is intended to be a one-time event with no further sampling planned. All monitoring is completed following annual work plans and standard operating procedures (SOP's) developed by the MDA.

Wells in one township in Freeborn County (Mansfield Township) will be sampled in 2020 as part of the PWPS Project. As such, there is no chemistry data available at this time. When sampling is offered and performed, it is anticipated that the contract lab will analyze for approximately 125 pesticide compounds and nitrate. More information is available at:
www.mda.state.mn.us/pwps

Pesticide Water Quality Monitoring

The Minnesota Department of Agriculture (MDA) has been conducting pesticide monitoring in ground water since 1985, and in surface waters since 1991. Annually, the MDA completes approximately 250 sample collection events from ground water and 800 sample collection events from rivers, streams, and lakes across the state. In general, the MDA collects water samples from agriculture and urban areas of Minnesota and analyzes water for up to approximately 150 different pesticide compounds that are widely used and/or pose the greatest risk to water resources. Groundwater monitoring is conducted by MDA and Minnesota Pollution Control Agency staff. Surface water monitoring is conducted by MDA and local organizations. All monitoring is completed following annual work plans and standard operating procedures (SOP's) developed by the MDA.

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In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

The purpose of the MDA's pesticide monitoring program is to determine the presence and concentration of pesticides in Minnesota waters, and present long-term trend analysis. Trend analysis requires a long-term investments in monitoring within the MDA's established networks. The MDA releases an annual water quality monitoring report that includes all pesticide water quality data and long term trends available at www.mda.state.mn.us/monitoring. MDA's surface and groundwater water quality data is also available at the National Water Quality Monitoring Council: https://www.waterqualitydata.us/ . The MDA will continue to conduct statewide pesticide monitoring in the future and will provide additional information related to the occurrence of pesticides in Minnesota waters.

Groundwater Monitoring Wells

The MDA samples one monitoring well in the Shell Rock and Winnebago Rivers Watershed. Monitoring at this well began in 2013 and it is sampled twice a year. Pesticide and nitrate data is available for the well. Semiannual and hourly water level measurements are also available for the site.

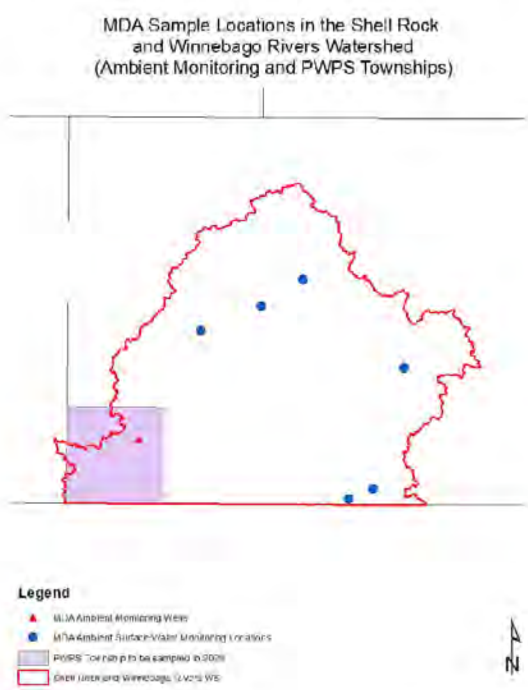
Nine different pesticides or pesticide breakdown products (or degradates) have been detected in this well. None have exceeded human health reference values.

Nitrate-nitrite (nitrate) has been detected in the well. The nitrate concentrations range from 2 to 60 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L. Monitoring of this site is expected to continue into the future.

Surface Water Monitoring

The MDA has completed six pesticide and/or nutrient water quality sample collection events from six river and stream locations within the Shell Rock River and Winnebago River Watershed from 2010-2011. There are currently no pesticide water quality impairments in the watershed.

The MDA does not have any on-going surface water monitoring in these watersheds.



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Nitrogen and Pesticide Use Surveys
The MDA surveys farmers through the National Agricultural Statistics Service (NASS). A summary of the survey data is attached. The most recent nitrogen use survey was for the 2014 crop year. The most recent pesticide use survey was from the 2013 crop year. More information is available at: https://www.mda.state.mn.us/pesticide-and-fertilizer-use-surveys

Minnesota Agricultural Water Quality Certification Program (MAWQCP)
The MAWQCP is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect water quality. Participants that implement and maintain approved farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This is a planning program that should be included in the 1W1P because it is an opportunity for agricultural producers to evaluate nutrient and field management practices within the watershed to help reduce losses. Additional information on the MAWQCP is available at: www.mda.state.mn.us/awqcp.

Currently there are 9 certified producers operating over 5500 acres in the Shell Rock River and Winnebago River Watershed. Another 4 farms are currently being assessed on approximately 1700 acres.

Nutrient Management Initiative (NMI)
The NMI program assists crop advisers and farmers in evaluating nutrient management practices on their own fields through the use of on-farm trials. This is a great opportunity to promote new strategies that could improve fertilizer use efficiency, as well as to help open the door to include local cooperators in the water quality discussion. Since 2015, there have been approximately 500 on-farm trials established in Minnesota through this program. Across the state, NMI trials have included cover crops, fertilizer placement, tillage, as well as precision agriculture and technology. Through this program crop advisors or local SWCD staff work directly with farmers and focus on new management strategies within the farmer's field.
Within the Shell Rock River and Winnebago River watershed, there have been about sixteen NMI trials. The trials in this watershed have focused on nitrogen application rates and nitrogen stabilizer products. More advanced trials in this program are coordinated with University of Minnesota researchers and have been used to help guide corn nitrogen rate recommendations for this region of the state. More information on this program is available at: www.mda.state.mn.us/nmi

For reference, the University of Minnesota nutrient management recommendations for agronomic crops grow in MN can be found here: https://extension.umn.edu/nutrient-management/crop-specific-needs

NMI Sites in the Shell Rock River and Winnebago River Watersheds

The AgBMP Loan Program
The AgBMP Loan Program is a water quality program that provides low interest loans to farmers, rural landowners, and agriculture supply businesses. The purpose is to encourage agricultural best management practices that prevent or reduce runoff from feedlots, farm fields, and other pollution problems identified by the county in local water plans. In addition, these loans are available to help finance repairs, replacement wells, or water treatment equipment to provide safe drinking water to rural residents who have water quality issues. See: www.mda.state.mn.us/agbmploans

Minnesota Agricultural BMP Handbook (revised in 2018)
The MDA recently supported an update to this handbook initially created in 2012. This handbook provides a comprehensive summary of BMPs that are practical for Minnesota. The handbook incorporates the most current data to create realistic estimates of the benefits of best management practice implementation. Estimates of effectiveness, economic consideration and other potential barriers are included with each BMP description in this handbook. This resource may be an especially useful reference for outreach and implementation planning efforts in the agricultural portions of the watershed. This handbook is available at: www.mda.state.mn.us/agbmphandbook

Agricultural Land Preservation Program
The MDA assists local government in protection of farmland through its Agricultural Land Preservation Program. This includes online tools and programmatic support. More information is available at https://www.mda.state.mn.us/environment-sustainability/farmland-protection

Agricultural Growth, Research, and Innovation (AGRI) Program
The AGRI program has funding that may be helpful in water quality protection. Specifically:

- The AGRI **Livestock Investment Grant** encourages long-term industry development for Minnesota livestock farmers and ranchers by helping them improve, update, and modernize their livestock operation infrastructure and equipment. More information is available at www.mda.state.mn.us/livestockinvestment.

- The AGRI **Sustainable Agriculture Demonstration Grant** supports innovative on-farm research and demonstrations. It funds projects that explore sustainable agriculture practices and systems that could make farming more profitable, resource efficient, and personally satisfying. Findings are published in the MDA's annual *Greenbook*. More information is available at www.mda.state.mn.us/sustagdemogrant.

Minnesota Water Research Digital Library
There may be other water studies specific to this watershed that may be helpful to review and reference in the 1W1P process. See: https://www.mda.state.mn.us/protecting/cleanwaterfund/toolstechnology/mnwrl

Thank you again for the opportunity to provide background and relevant information as we look forward to being involved in the 1W1P process.

Sincerely,

Jeff Berg
Water Policy Specialist
Minnesota Department of Agriculture

C: Dave Copeland – BWSR Board Conservationist

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June 19, 2019

Courtney Phillips
Shell Rock River Watershed District
214 W Main St
Albert Lea, MN 56007

RE: Response to request for priority concerns for the Shell Rock River Watershed One Watershed, One Plan

Dear Courtney Phillips:

The Minnesota Pollution Control Agency (MPCA) appreciates the opportunity to provide input at the outset of the One Water, One Plan (1W1P) process in the Shell Rock River Watershed (SRRW) and Winnebago River Watershed (Winnebago). We thank you for your efforts and for considering our input.

The MPCA has coordinated and funded many efforts in the SRRW and Winnebago watersheds and is excited to supply technical information, tools and strategies for use in 1W1P planning process. A summary of select products is included as a preface to a listing of priority concerns. Others are summarized on MPCA's watershed web pages:

Shell Rock River: https://www.pca.state.mn.us/water/watersheds/shell-rock-river
Winnebago: https://www.pca.state.mn.us/water/watersheds/winnebago-river

The MPCA is committed to providing assistance in interpreting and applying the substance of the Watershed Restoration and Protection Strategy (WRAPS), Nutrient Reduction Strategy (NRS), Hydrological Simulation Program-Fortran (HSPF) models, Stressor Identification (SID) conclusions, etc. going forward as these and other priority concerns are installed and addressed in the 1W1P framework. We hope the following information provided is helpful in prioritizing water resource work to protect and improve human health and the environment.

The following MPCA products are available for use in the 1W1P process:

- **SRRW Monitoring and Assessment Report (2012).** The assessment report summarizes results of intensive watershed monitoring. https://www.pca.state.mn.us/sites/default/files/wq-ws3-07080202b.pdf

- **SRRW Stressor Identification Report (2014).** The stressor identification report examines biota impairments in the context of probable causal factors (i.e. "stressors"). https://www.pca.state.mn.us/sites/default/files/wq-ws5-7080202.pdf

Courtney Phillips
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- **Winnebago Monitoring and Assessment Report (2018)**. The assessment report summarizes results of intensive watershed monitoring. https://www.pca.state.mn.us/sites/default/files/wq-ws3-07080203b.pdf

- **Winnebago Stressor Identification Report (2017).** The stressor identification report examines biota impairments in the context of probable causal factors (i.e. "stressors"). https://www.pca.state.mn.us/sites/default/files/wq-ws5-07080203a.pdf

- **Watershed Pollutant Load Monitoring Network (currently maintained website).** The Watershed Pollutant Load Monitoring Network (WPLMN) measures and compares data on pollutant loads from Minnesota's rivers and streams and tracks water quality trends. A new data viewer allows for interactive examination and retrieval of load data, including a site on the Shell Rock River near Gordonsville. https://www.pca.state.mn.us/water/watershed-pollutant-load-monitoring-network

- **Point source phosphorus mapping tool (currently maintained website).** This tool provides via interactive map interface summaries of annual phosphorus loads and flow volumes discharged from wastewater facilities since 2005. https://www.pca.state.mn.us/water/phosphorus-loads-and-flow-volumes

- **Agricultural Phosphorus Balance Calculator: A tool for watershed planning.** Journal of Soil and Water Conservation 72(4): 395-404. www.swcs.org. A study conducted by Minnesota Department of Agriculture (MDA) staff, Heidi Peterson et al., on a whole watershed phosphorus balance for the Shell Rock Watershed. Done through sponsorship from SRRWD and 319 grant.

The table, on the following page, lists streams and lakes identified as resource concerns per the 2018 Impaired Waters 303(d) list and the corresponding issues affecting them:

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2018 Impaired Waters List for the Shell Rock River & Winnebago Watersheds:

Water body name	Water body description	Watershed name	AUID	Affected designated use	Impairment	Aquatic Life Stressors (for fish/invert impairments)
Albert Lea	Lake or Reservoir	Shell Rock River	24-0014-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Bancroft Creek (County Ditch 63)	CD 63 to Fountain Lk	Shell Rock River	07080202-507	Aquatic Recreation	Escherichia coli	
Fountain (East Bay)	Lake or Reservoir	Shell Rock River	24-0018-01	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Fountain (West Bay)	Lake or Reservoir	Shell Rock River	24-0018-02	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Pickeral	Lake or Reservoir	Shell Rock River	24-0025-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Shell Rock River	Albert Lea Lk to Goose Cr	Shell Rock River	07080202-501	Aquatic Life	Aquatic macroinvertebrate bioassessments	nitrate, pH, phosphorus, chl-a
					Fishes bioassessments	
					Dissolved oxygen	
					Nutrient/eutrophication biological indicators	
					pH	
					Turbidity	
				Aquatic Recreation	Fecal Coliform	
Unnamed creek (Schoff Ck)	Mud Lk to Fountain Lk	Shell Rock River	07080202-516	Aquatic Life	Nutrient/eutrophication biological indicators	
					Turbidity	
Unnamed creek (Wedge Ck)	T103 R22W S36, north line to Unnamed ditch	Shell Rock River	07080202-531	Aquatic Recreation	Escherichia coli	
White	Lake or Reservoir	Shell Rock River	24-0024-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Bear	Lake or Reservoir	Winnebago River	24-0028-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Judicial Ditch 25	Unnamed ditch to Unnamed cr	Winnebago River	07080203-515	Aquatic Life	Dissolved oxygen	
					Fishes bioassessments	eutrophication, DO, habitat, flow alteration
Lime Creek	Bear Lk to MN/IA border	Winnebago River	07080203-501	Aquatic Life	Aquatic macroinvertebrate bioassessments	eutrophication, TSS, DO, habitat, flow alteration
					Fishes bioassessments	
					Dissolved oxygen	
					Nutrient/eutrophication biological indicators	
Lime Creek	Bear Lk to MN/IA border	Winnebago River	07080203-501	Aquatic Recreation	Escherichia coli	
State Line	Lake or Reservoir	Winnebago River	24-0030-00	Aquatic Recreation	Nutrient/eutrophication biological indicators	
Steward Creek (County Ditch 23)	Headwaters to Bear Lk	Winnebago River	07080203-504	Aquatic Life	Aquatic macroinvertebrate bioassessments	nitrate, eutrophication, DO, habitat, flow alteration
					Dissolved oxygen	
Unnamed creek	JD 26 to MN/IA border	Winnebago River	07080203-509	Aquatic Life	Dissolved oxygen	

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According to the findings of these and other works, the MPCA lists the following priority concerns for consideration in the 1W1P process:

- **Nutrient reduction.** Elevated nutrients in surface waters, specifically phosphorus and nitrate, is a long-standing issue in southern Minnesota. Excess nutrients cause algal blooms resulting in high dissolved oxygen (DO) fluctuations. High amounts of nitrogen can be toxic to fish and macro invertebrates. The Minnesota Nutrient Reduction Strategy and the forthcoming WRAPS and TMDLs for the SRRW and Winnebago will draw on various citations to describe sources, transport, reductions, and the best strategies for nutrient reduction and include:

  a) Point source reduction: Reductions in phosphorus from various permitted point sources is needed in order to meet goals set by TMDLs and NRS. Wasteload Allocations contained in future TMDLs will summarize point source phosphorus contributions and reductions including Municipal Separate Storm Sewer Systems (MS4s), wastewater treatment plants, National Pollutant Discharge Elimination System (NPDES) permitted industrial facilities and NPDES permitted construction facilities.

  b) Non-point source reduction: Because of the high agricultural land use in this planning boundary, prioritizing the implementation of agricultural best management practices (BMPs) will be key in reducing nitrogen and phosphorus loads. Recommended practices include but are not limited to planting cover crops, nutrient management, keeping existing pastures/rangelands, and increasing/maintaining Conservation Reserve Program (CRP) acreage.

  Nutrient reduction BMPs need broad application in our state including the SRRW and Winnebago. The 1W1P should provide a foundation for efforts going forward to address nitrogen and phosphorus impairments.

- **Improve and protect the watershed's lakes.** Generally, local partners and landowners need to make a long-term commitment to reduce phosphorus and sediment entering lakes in order to improve water quality. The Shell Rock 1W1P area has 18 shallow lakes over 10 acres in size; most prominent being Fountain and Albert Lea lakes. Seven shallow lakes in this planning boundary have been assessed and listed as impaired for eutrophication:

  - **SRRW:** Pickeral, Albert Lea, Fountain – East Bay, Fountain – West Bay, and White.
  - **Winnebago:** Bear and Stateline.

  In the SRRW, the impaired lakes are connected through a series of surface channels. Because of this lake chain connection, the water quality condition of upstream lakes are consequential to those downstream. Consideration of how the SRRW chain of lakes interact should aid in prioritization of efforts/resources in addressing lake impairments. The MPCA emphasizes the need to support Minnesota Department of Natural Recourses shallow lake management strategies including seasonal draw downs and/or rough fish control to achieve and maintain clear water/aquatic plant-dominated states. There is also a need to pair the on-going dredging activities of Fountain Lake with a comprehensive approach for reducing external phosphorus loads. Incorporating a holistic and comprehensive watershed approach will encourage long term success of acute management activities in Fountain Lake. The condition of lakes in these two

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watersheds are also indicative of their inflows. River and stream restoration alongside reduced pollutant loading from point sources are important components of lake improvement and protection.

- **Further study and address habitat issues in streams.** Degraded and/or insufficient stream habitat is a prevalent stressor of biota (i.e. "fish and bugs") in southern Minnesota and in the SRRW and Winnebago. The 1W1P should consider the best strategies for addressing habitat issues in various settings and at various scales. State monies are supporting natural channel design projects in watersheds with intense altered hydrology. The MPCA acknowledges the work SRRWD has done implementing two-stage ditches and encourages continued planning for projects mimicking natural channel conditions for drainage ditches. A thoughtful and technically supported approach to optimally applying these various habitat improvement methods would be a good outcome for 1W1P.

- **Hydrology management.** Southern Minnesota is known for its productive soils and resulting intensive agricultural land use. Agricultural drainage (tiling and drainage ditches) is a common occurrence in the Shell Rock 1W1P area. Hydrology is a central element to improved water quality and significantly affects all other components of watershed health. Flow alteration and altered hydrology have been identified as significant stressors to the biota in the SRRW and Winnebago. Managing for hydrology results in benefits for both water quantity and water quality.

  a) Soil Health: Improvements in soil health can result in more water infiltration and less runoff. Soil organic matter improvements are known to provide increased storage of water within in the soil profile (U.S. Department of Agriculture - Natural Resources Conservation Service). With high agricultural land use in the Shell Rock 1W1P area, it is strongly suggested soil health practices be encouraged for adoption to provide long-term benefits to soil, farmers, and water resources.

  b) Drainage system management: A comprehensive drainage system management effort is needed to address stream hydrology issues for the long-term. This involves drainage networks and systems in both rural and urban areas.

     Rural: Drainage system management begins at the field and farm scale, with practices to improve soil conditions and increase water storage. This includes drainage water management at the field scale and multi-purpose drainage management at the public drainage system scale (see Minn. Stat. 103E.015). Landowners involved with private multi-farm tile and ditch systems should be engaged to establish practical water storage practices. Water storage should also be addressed at the field level with soil and tillage management, as well as floodplain storage and depressional storage within each subwatershed. It should be noted that Freeborn County has developed Drainage Management Plans for two public ditch systems within the Winnebago and can be valuable starting points for developing plans for additional ditch systems.

     Urban: Stormwater runoff management in urban areas is also needed for flood reduction and water quality improvement. The city of Albert Lea is using a stormwater management program as part of the MS4 requirements. This is important for water resources within city boundaries and for the Shell Rock River downstream. The small

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communities not regulated as MS4s should be encouraged and provided assistance for stormwater treatment and water storage efforts.

- **Work to reduce pathogens in surface waters.** The presence of fecal pathogens in surface water is a regional problem in southern Minnesota. Manure runoff, unsewered communities, failing Subsurface Sewage Treatment System (SSTS), and over-grazed pastures (among others) are areas to target for *E. coli* reduction. Draft *E. coli* TMDLs will be available for the SRRW and Winnebago and should be considered for planning purposes. The 1W1P should support continued work to better understand *E. coli* indicator presence (see TMDLs document for research needs) and reduce pathogen loading to surface waters.

- **Additional Stressors and Pollutants.** Sediment (and associated turbidity), DO, aquatic habitat and flow alteration are prevalent stressors of aquatic life in the SRRW and Winnebago. They are implicitly addressed by the priority concerns listed above. Focusing on nutrient reductions, hydrology management and stream habitat issues in these watersheds will result in corresponding actions addressing aquatic life stressors.

Again, thank you for the opportunity to review and comment on the draft 1W1P. If we may be of further assistance, please call Emily Bartusek from the MPCA Rochester office at 507-206-2613, or email her at emily.bartusek@state.mn.us.

Sincerely,

Wayne Cords

This document has been electronically signed

Wayne Cords
Manager
South Section
Watershed Division

WC/EB:jdf

cc: David Copeland, Board Conservationist, Minnesota Board of Water and Soil Resources
Katrina Kessler, Assistant Commissioner, MPCA

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

June 24, 2019

Courtney Phillips
Shell Rock River Watershed District
214 West Main St.
Albert Lea, MN 56007

Subject: Initial Comment Letter – Shell Rock River and Winnebago River Watersheds 1W1P

Dear Courtney:

Thank you for the opportunity to submit comments regarding water management issues for consideration in the One Watershed One Plan (1W1P) for the Shell Rock River and Winnebago River Watershed Planning Area. Our agency looks forward to working closely with the local government units, stakeholders, and other agency partners on this watershed planning initiative.

The Minnesota Department of Health's (MDH) mission is to protect, maintain, and improve the health of all Minnesotans. An important aspect to protecting citizens health is the protection of drinking water sources. MDH is the agency responsible for implementing programs under the federal Safe Drinking Water Act (SDWA).

Source Water Protection (SWP) is the framework MDH uses to protect drinking water sources. The broad goal of SWP in Minnesota is to protect and prevent contamination of public and private sources of groundwater and surface water sources of drinking water using best management practices and local planning. Core MDH programs relevant to watershed planning are the State Well Code (MR 4725), Wellhead Protection (MR 4720) and surface water / intake protection planning resulting in a strong focus in groundwater management and protecting drinking water sources.

One of the three high level state priorities in Minnesota's Nonpoint Priority Funding Plan is to "Restore and protect water resources for public use and public health, including drinking water" which aligns with our agency's mission and recommendations to your planning process.

An equal opportunity employer.

MDH Priority Concerns:

Prioritize existing and future Drinking Water Supply Management Areas (DWSMA) in the Shell Rock River and Winnebago River Watershed 1W1P.

DWSMA boundaries establish a protection area through an extensive evaluation that determines the contribution area of a public water supply well, aquifer vulnerability and provide an opportunity to prioritize specific geographic areas for drinking water protection purposes. DWSMA boundaries that extend beyond city jurisdictional limits or are established in Wellhead Protection (WHP) Action Plans for nonmunicipal public water supplies, like mobile home parks, can be a special focus for local partners prioritizing drinking water protection activities.

Aquifer vulnerability determines the level of management required to protect a drinking water supply and provides an opportunity to target implementation practices in accordance with the level of risk different land uses pose. The attached Public Water Supply Summary Spreadsheet highlights the primary drinking water protection activities for many DWSMAs in the watershed.

Prioritize Sealing Abandoned Wells

Unused, unsealed wells can provide a conduit for contaminants from the land surface to reach the sources of drinking water. This activity is particularly important for abandoned wells that penetrate a confining layer above a source aquifer.

Sealing wells is a central practice in protecting groundwater quality, however when resource dollars are limited it is important to evaluate private well density to identify the populations most at risk from a contaminated aquifer.

Prioritize Protection of Private Wells

Many residents rely on a private well for the water they drink. However, no public entity is responsible for water testing or management of a private well after drilling is completed. Local governments are best equipped to assist private landowners through land use management and ordinance development, which can have the greatest impact on protecting private wells. Other suggested activities to protect private wells include: hosting well testing or screening clinics, providing water testing kits, working with landowners to better manage nutrient loss, promoting household hazardous waste collection, managing storm water runoff, managing septic systems, and providing best practices information to private well owners.

Note in the watershed planning area, there are many private wells that exceed the EPA maximum contaminant level of 10 ug/L arsenic.

Prioritize Protecting Noncommunity Public Water Supplies

Noncommunity public water supplies provide drinking water to people at their places of work or play (schools, offices, campgrounds, etc.). Land use and management activities (maintaining/upgrading SSTS, well sealing, etc.) should consider effects on these public water

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systems. Find information regarding noncommunity public water supplies in the watershed in reports titled Source Water Assessments (SWA) at:
https://www.health.state.mn.us/communities/environment/water/swp/swa.html

Source Water Assessments provide a concise description of the water source - such as a well, lake, or river - used by a public water system and discuss how susceptible that source may be to contamination.

Attached you will find a listing of MDH data and information to help you in the planning process. Please include me as the MDH contact for the Advisory Committee. Thank you for the opportunity to be involved in your watershed planning process. If you have any questions, please feel free to contact me at (507) 206-2734 or jennifer.ronnenberg@state.mn.us.

Sincerely,

Jennifer Ronnenberg

Jennifer Ronnenberg, Principal Planner
Minnesota Department of Health
Source Water Protection Unit
18 Wood Lake Dr. SE
Rochester, MN 55904

Attachments

CC: Mark Wettlaufer, MDH Source Water Protection Unit
Justin Blum, MDH Source Water Protection Unit
Carrie Raber, MDH Source Water Protection Unit
Derek Richter, MDH Source Water Protection Unit
Chris Elvrum, MDH Well Management Section
Dave Copeland, BWSR Board Conservationist
Shaina Keseley, BWSR Clean Water Specialist
Barbara Weisman, Dan Giralamo, DNR
Juline Holleran, Emily Bartusek, MPCA
Margaret Wagner, Jeff Berg, MDA

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Targeting Groundwater & Drinking Water Activities in the 1W1P Planning Process

Limitation of Existing Tools –

Watershed models used for prioritizing and targeting implementation scenarios in the 1W1P, whether PTMapp, HSPF-Scenario Application Manager (SAM) or others, leverage GIS information and/or digital terrain analysis to determine where concentrated flow reaches surface water features. While this is an effective approach for targeting surface water contaminates, it does not transfer to groundwater concerns because it only accounts for the movement of water on the land's surface. Unfortunately, targeting tools are not currently available to model the impact on groundwater resources. The Minnesota Department of Health suggests using methodologies applied by the agency to prioritize and target implementation activities in the Source Water Protection program.

Using the Groundwater Restoration and Protection Strategies (GRAPS) Report –

The MDH, along with its state agency partners, are developing a Groundwater Restoration and Protection Strategies (GRAPS) report for the Shell Rock and Winnebago River Watersheds. GRAPS will provide information and strategies on groundwater and drinking water supplies to help inform the local decision making process of the 1W1P. Information in a GRAPS Report can be used to identify risks to drinking water from different land uses. Knowing the risks to drinking water in a specific area allows targeting of specific activities.

- Prioritize Actions Identified in the Groundwater Restoration and Protection Strategies (GRAPS) report.

Using Wellhead Protection Plans –

- Identify Drinking Water Supply Management Areas (DWSMA) located in the watershed.
- Examine the vulnerability of the aquifer to contamination risk to determine the level of management required to protect groundwater quality. For example, a highly vulnerable setting requires many different types of land uses to be managed, whereas a low vulnerability setting focuses on a few land uses due to the long recharge time and protective geologic layer.
- Use the Management Strategies Table in a Wellhead Protection Plan to identify and prioritize action items for each DWSMA

Using Guidance Documents to Manage Specific Potential Contaminant Sources –

The MDH has developed several guidance documents to manage impacts to drinking water from specific potential contaminant sources. Topics include mining, stormwater, septic systems, feedlots, nitrates, and chemical and fuel storage tanks. This information is available at

https://www.health.state.mn.us/communities/environment/water/swp/resources.html

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MDH Data and information:

- Drinking Water Statistics – Where do people get their drinking water in the Shell Rock and Winnebago Watersheds? Approximately 100% obtain their drinking water from groundwater sources. This information can help you understand where people are obtaining their drinking water and develop implementation strategies to protect the sources of drinking water in the watershed.

- A spreadsheet of the public water supply systems in the watershed, status in wellhead protection planning, and any drinking water protection concerns or issues that have been identified in protection areas. This information can help you understand the drinking water protection issues in the watershed, prioritize areas for implementation activities, and identify potential multiple benefits for implementation activities.

- Shape files of the Drinking Water Supply Management Areas (DWSMA) in the watershed are located at https://www.health.state.mn.us/communities/environment/water/swp/maps/index.htm. This information can help you prioritize and target implementation activities that protect drinking water sources for public water supplies.

MDH Figures:

- A figure detailing the "Pollution Sensitivity of Near-Surface Materials". This information can help you understand the ease with which recharge and contaminants from the ground surface may be transmitted into the upper most aquifer on a watershed scale. Individual wellhead protection areas provide this same information on a localized scale. This is turn can be used to prioritize areas and implementation activities.

- A figure detailing "Pollution Sensitivity of Wells". This information can help you understand which wells in the watershed are most geologically sensitive based on the vulnerability of the aquifer in which the well is completed. This information allows for targeting of implementation activities to the sources of water people are drinking.

- A figure detailing "Nitrate Results and Pollution Sensitivity of Near-Surface Materials". This information takes what we know about the sensitivity of water table aquifers and combines it with well chemistry nitrate results. This figure can help prioritize implementation activities aimed at reducing nitrate levels in the sources of drinking water.

- A figure detailing "Arsenic Results". This information can help you understand which wells in the watershed contain elevated arsenic levels.

- A figure detailing "DWSMA Vulnerability". This information can help you understand which DWSMA is most vulnerable to contamination from the ground surface. This figure allows for targeting of implementation activities for public water suppliers.

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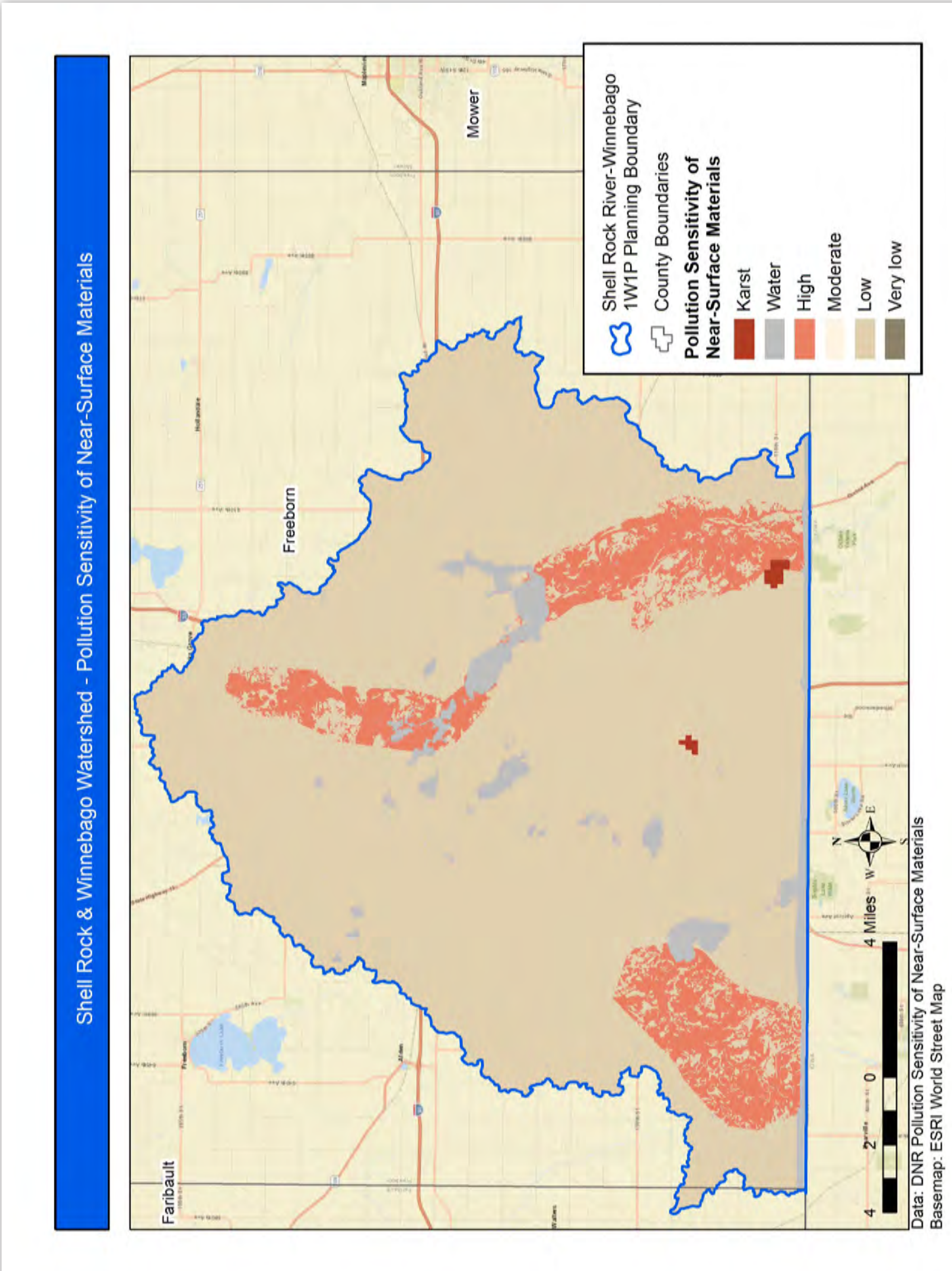
Shell Rock River and Winnebago River Watersheds Public Water Supplies - Drinking Water Protection Concerns for Quality

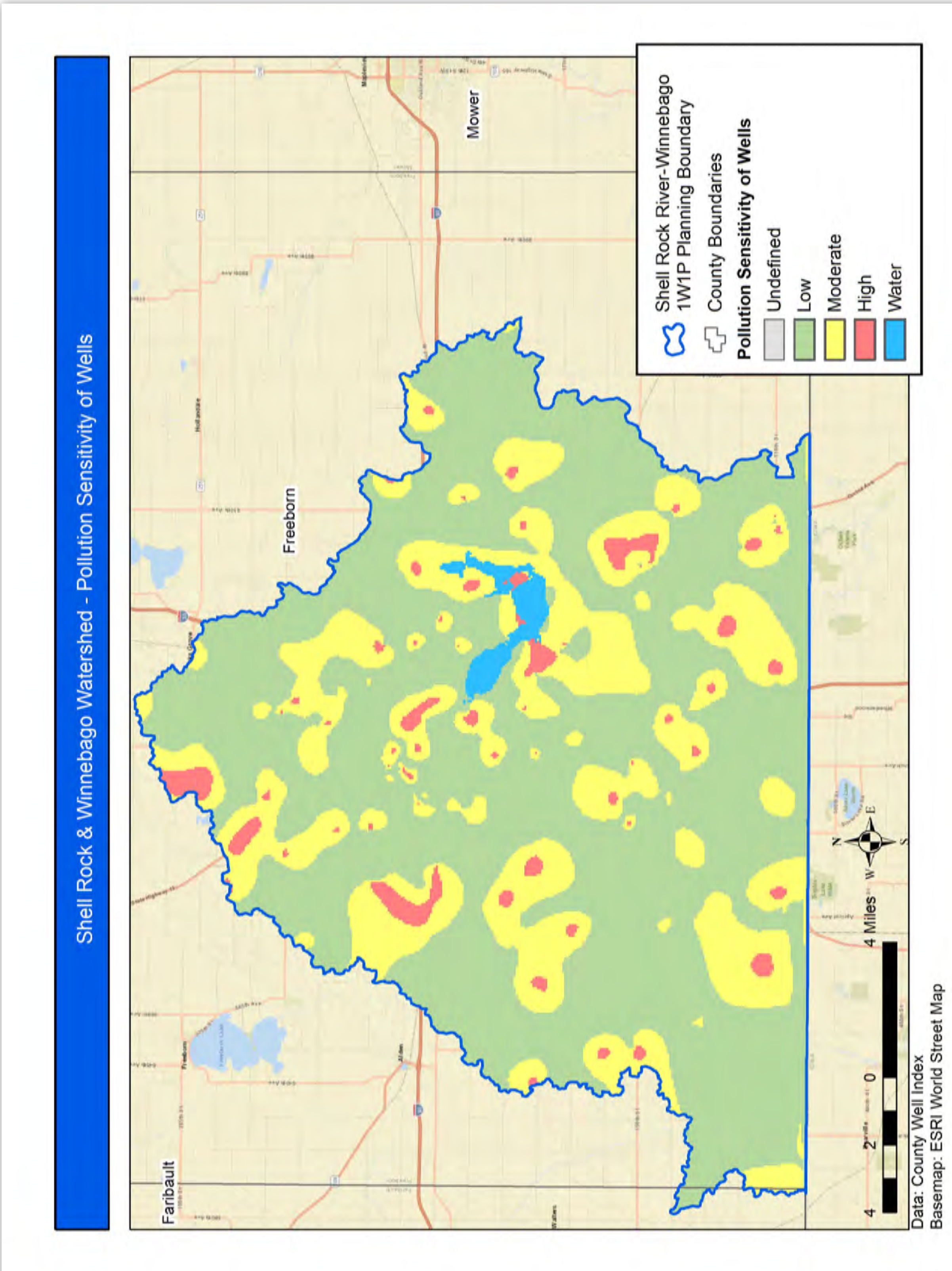
Aquifer Risk	Name	County	HUC 8 Watershed	HUC 12 Watershed	Type of System	WHP Plan	DWSMA Vulnerability	Known Drinking Water Protection Concerns
High potential contaminant risk -								
Focus on potential land use contaminant sources that may impact water quality								
	Albert Lea - 3 wells	Freeborn	Shell Rock	Albert Lea Lake	municipal	completed	moderate/low	detectable nitrate and arsenic
	Glenville	Freeborn	Shell Rock	Cty Ditch #16	municipal	completed	moderate/high	low arsenic values
Low or Unassessed potential contaminant risk -								
Focus on sealing of unused wells and old public water supply wells (funding available from MDH)								
	Elmwood Terrace	Freeborn	Shell Rock	Bancroft Creek	non-municipal	not started	na	elevated arsenic values
	Twin Lakes	Freeborn	Shell Rock	Cty Ditch #10	municipal	not started	na	
	Manchester	Freeborn	Shell Rock	Cty Ditch #77	municipal	not started	na	low arsenic values
	Hayward	Freeborn	Shell Rock	Peter Lund Creek	municipal	not started	na	
	Conger	Freeborn	Winnebago	Bear Lake	municipal	not started	na	very low nitrate detects
	Emmons	Freeborn	Winnebago	State Line Lake-	municipal	not started	na	
Noncommunity Public Water Suppliers								
Focus on providing technical assistance to assess and remediate land use controlled contaminants								
	Hayward Rest Area MNDOT	Freeborn	Shell Rock	Albert Lea Lake	transient	not started	na	
	Myre Big Island State Park - 5 wells	Freeborn	Shell Rock	Albert Lea Lake	transient	not started	na	low nitrate detects in some wells
	Our Father's House	Freeborn	Shell Rock	Albert Lea Lake	transient	not started	na	
	Pickerel Lake Park	Freeborn	Shell Rock	Albert Lea Lake	transient	not started	na	very low nitrate detects, no trend
	Concordia Lutheran Church	Freeborn	Shell Rock	Albert Lea Lake	transient	not started	na	very low nitrate detects, possible upward trend
	Waste Management of Southern MN	Freeborn	Shell Rock	Bancroft Creek	non-transient	not started	na	low level nitrate, upward trend
	Central Freeborn Lutheran Church	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	
	Rihm Kenworth	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	very low nitrate detects
	East Freeborn Lutheran Church	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	
	LKQ	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	
	Bancroft Park	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	
	Three Oaks Winery	Freeborn	Shell Rock	Bancroft Creek	transient	not started	na	low levels nitrate, possible up trend
	Round Prairie Lutheran Church	Freeborn	Shell Rock	Cty Ditch #10	transient	not started	na	
	White Woods Nature Park	Freeborn	Shell Rock	Cty Ditch #10	transient	not started	na	low level nitrate detects
	Lunder Lutheran Church	Freeborn	Shell Rock	Cty Ditch #10	transient	not started	na	

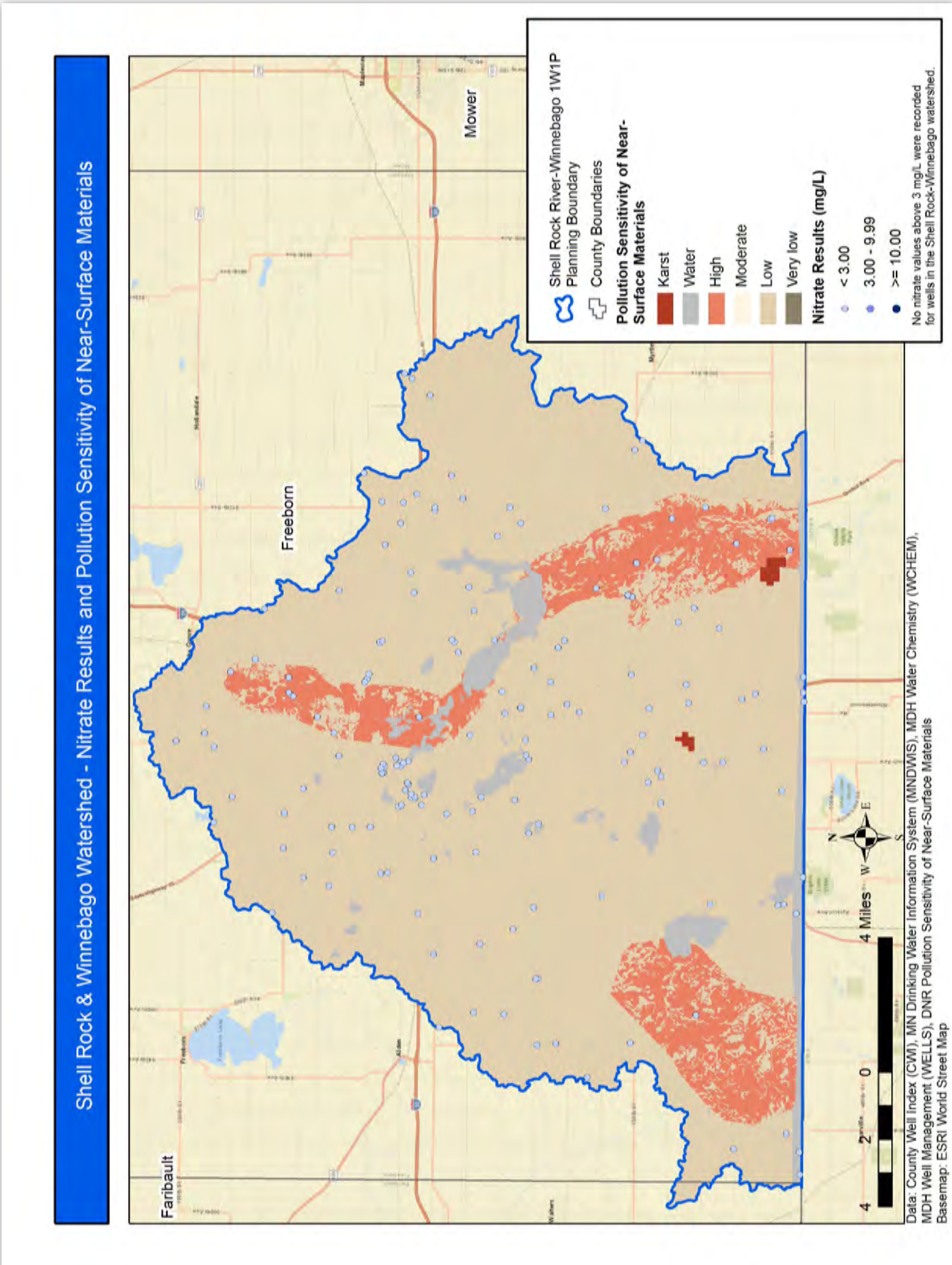
Aquifer Risk	Name	County	HUC 8 Watershed	HUC 12 Watershed	Type of System	WHP Plan	DWSMA Vulnerability	Known Drinking Water Protection Concerns
Noncommunity Public Water Suppliers								
Focus on providing technical assistance to assess and remediate land use controlled contaminants								
	Hickory Hills Campground	Freeborn	Shell Rock	Cty Ditch #10	transient	not started	na	
	POET Biorefining - Glenville - 3 wells	Freeborn	Shell Rock	Cty Ditch #16	non-transient	not started	na	low level nitrate, possible up trend, low levels of arsenic
	Renewable Energy Group - 2 wells	Freeborn	Shell Rock	Cty Ditch #16	non-transient	not started	na	
	Trading Post, Glenville	Freeborn	Shell Rock	Cty Ditch #16	transient	not started	na	historic nitrate detects, none recently
	Albert Lea Information Center MNDOT	Freeborn	Shell Rock	Cty Ditch #10	transient	not started	na	
	Vet's Whoa N Go	Freeborn	Shell Rock	Cty Ditch #77	transient	not started	na	
	Austin/Albert Lea KOA	Freeborn	Shell Rock	Peter Lund Creek	transient	not started	na	very low nitrate detects
	Bear Lake Concordia Lutheran Church	Freeborn	Winnebago	Bear Lake	transient	not started	na	very low nitrate detects, possible upward trend
	Pheasant Links	Freeborn	Winnebago	State Link Lake-Lime Crk	transient	not started	na	
	Emmons City Park	Freeborn	Winnebago	State Link Lake-Lime Crk	transient	not started	na	

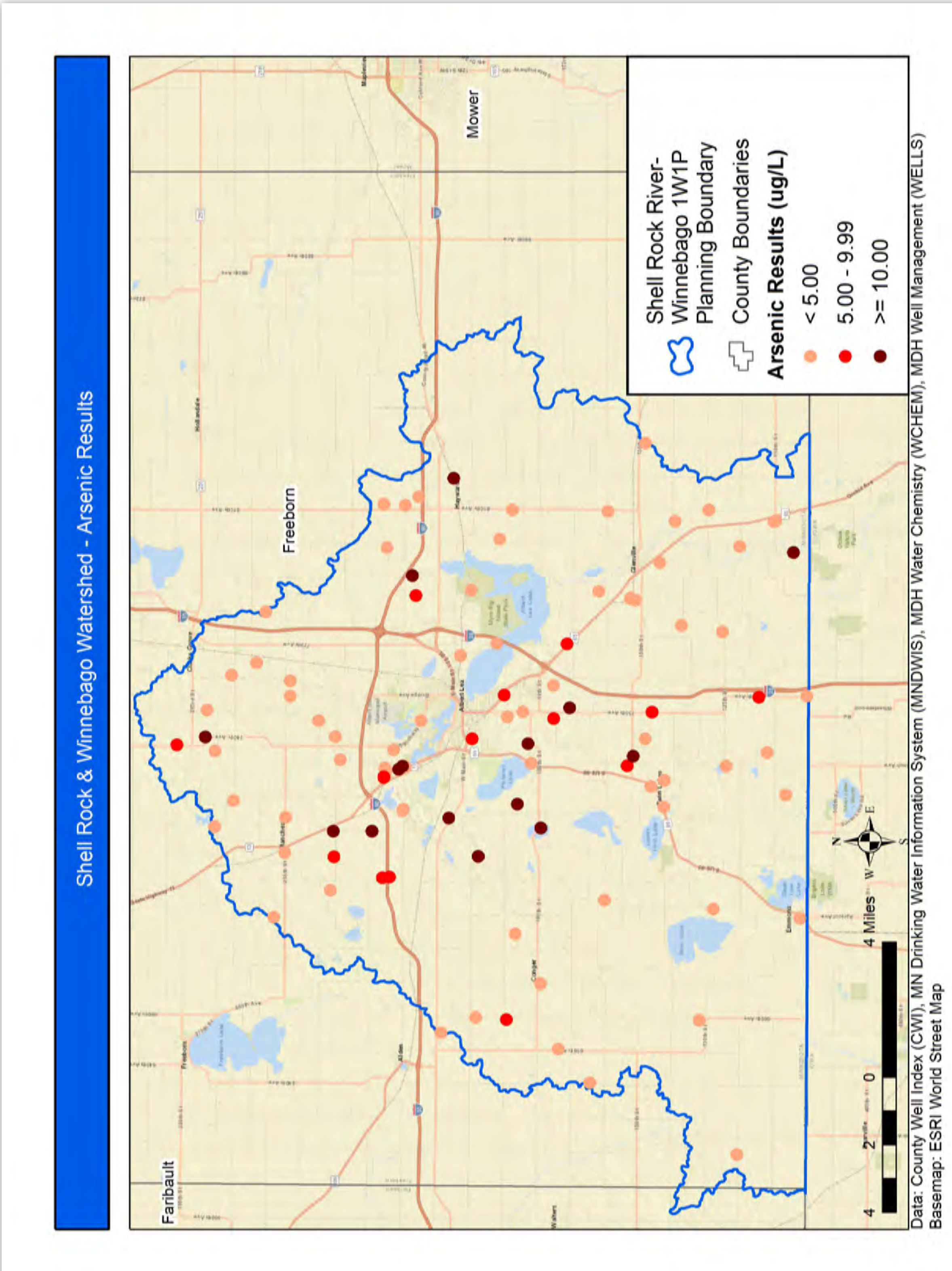
7 Community, Municipal Public Water Suppliers
1 Community, Non-Municipal Public Water Supplier
3 Non-Community, Non-Transient Public Water Suppliers
22 Non-Commmunity, Transient Public Water Suppliers

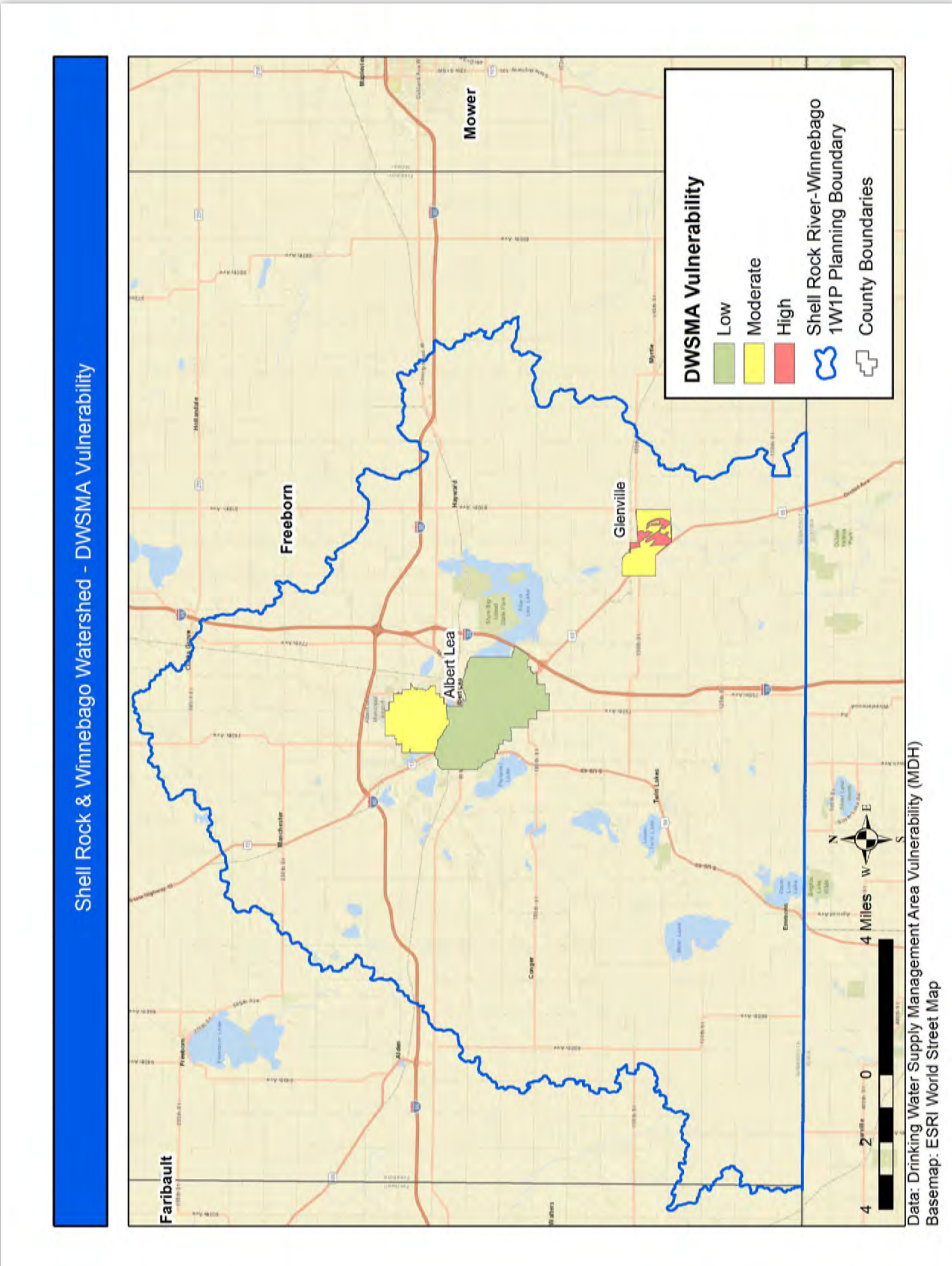
Acronyms:
DWSMA=Drinking Water Supply Management Area
WHP=Wellhead Protection Plan


Shell Rock & Winnebago Watershed - Pollution Sensitivity of Near-Surface Materials
Faribault
Freeborn
Mower
Shell Rock River-Winnebago 1W1P Planning Boundary
County Boundaries
Pollution Sensitivity of Near-Surface Materials
Karst
Water
High
Moderate
Low
Very low
4 2 0 4 Miles
N
W E
S
Data: DNR Pollution Sensitivity of Near-Surface Materials
Basemap: ESRI World Street Map


Shell Rock & Winnebago Watershed - Pollution Sensitivity of Wells
Faribault
Freeborn
Mower
Shell Rock River-Winnebago 1W1P Planning Boundary
County Boundaries
Pollution Sensitivity of Wells
Undefined
Low
Moderate
High
Water
4 2 0 4 Miles
N
W E
S
Data: County Well Index
Basemap: ESRI World Street Map


Shell Rock & Winnebago Watershed - Nitrate Results and Pollution Sensitivity of Near-Surface Materials
Faribault
Freeborn
Mower
Shell Rock River-Winnebago 1W1P Planning Boundary
County Boundaries
Pollution Sensitivity of Near-Surface Materials
Karst
Water
High
Moderate
Low
Very low
Nitrate Results (mg/L)
< 3.00
3.00 - 9.99
>= 10.00
No nitrate values above 3 mg/L were recorded for wells in the Shell Rock-Winnebago watershed.
4 2 0 4 Miles
N
E
S
W
Data: County Well Index (CWI), MN Drinking Water Information System (MNDWIS), MDH Water Chemistry (WCHEM), MDH Well Management (WELLS), DNR Pollution Sensitivity of Near-Surface Materials
Basemap: ESRI World Street Map


Shell Rock & Winnebago Watershed - Arsenic Results
Faribault
Freeborn
Mower
Shell Rock River-Winnebago 1W1P Planning Boundary
County Boundaries
Arsenic Results (ug/L)
< 5.00
5.00 - 9.99
>= 10.00
4 Miles
N
S
E
W
Data: County Well Index (CWI), MN Drinking Water Information System (MNDWIS), MDH Water Chemistry (WCHEM), MDH Well Management (WELLS)
Basemap: ESRI World Street Map


Shell Rock & Winnebago Watershed - DWSMA Vulnerability
DWSMA Vulnerability
Low
Moderate
High
Shell Rock River-Winnebago 1W1P Planning Boundary
County Boundaries
Faribault
Freeborn
Mower
Albert Lea
Glenville
4 Miles
4
2
0
N
S
E
W
Data: Drinking Water Supply Management Area Vulnerability (MDH)
Basemap: ESRI World Street Map

Winnebago and Shell Rock Watershed

One Watershed One Plan

Freeborn County

Minnesota Department of Agriculture
Nitrogen and Pesticide Use

The Minnesota Department of Agriculture surveys farmers through the National Agricultural Statistics Service. The most recent nitrogen use survey was for the 2014 crop year and the most recent pesticide use survey was for the 2013 crop year for all four crops with county data.

The following nitrogen use information is from the 2014 nitrogen use report, specifically the South Central BMP region.

Minnesota Nitrogen Best Management Practices Regions

Figure 1. Minnesota Nitrogen Best Management Practices Regions

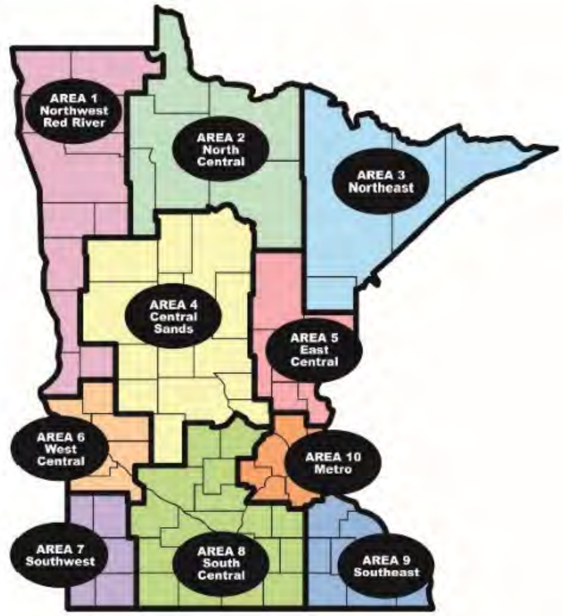


Figure 2. Minnesota Pesticide Best Management Practices Regions

Nitrogen use in the Winnebago and Shell Rock Rivers Watershed: 2014 Crop Year

More than five responses are required for any individual category to be reported. Regional data may not represent county data due to the low number of farmers represented from this county.

Fertilizer section

Figure 3 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following soybeans; the corresponding corn yields are detailed in red.

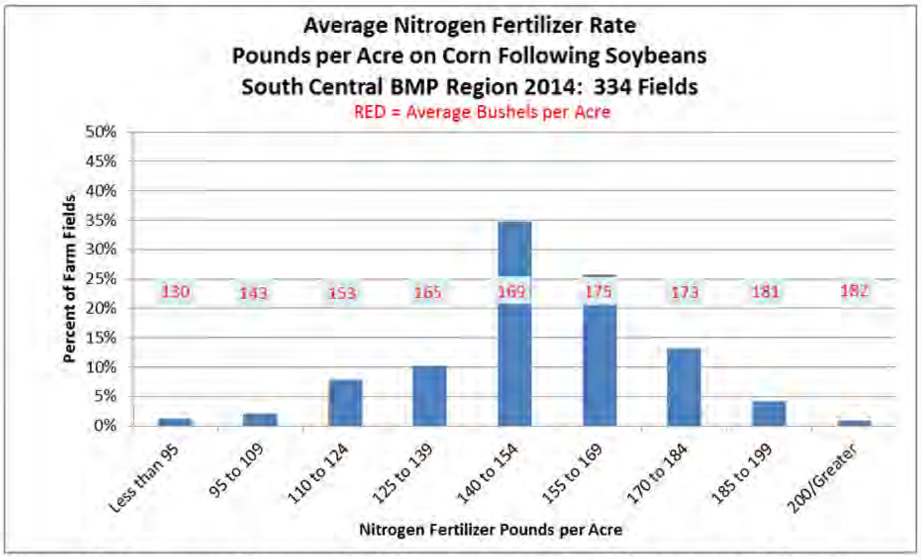


Figure 3. Average nitrogen fertilizer rates and yields on corn following soybeans in the SC BMP region for 2014: 334 fields.

In the SC BMP region, nitrogen fertilizer rates were an average of 155 pounds per acre in Freeborn County as shown in Table 1.

Table 1. Average county nitrogen fertilizer rates and corn yields for the SC BMP region for corn following soybeans.

Average County Nitrogen Fertilizer Rates for the SC BMP Region for corn following soybeans			
County	Number of Farm Fields	Average Nitrogen Rate Pounds per Acre	Average Corn Yield Bushels per Acre
Freeborn	30	155	173

Figure 4 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn; the corresponding corn yields are detailed in red.

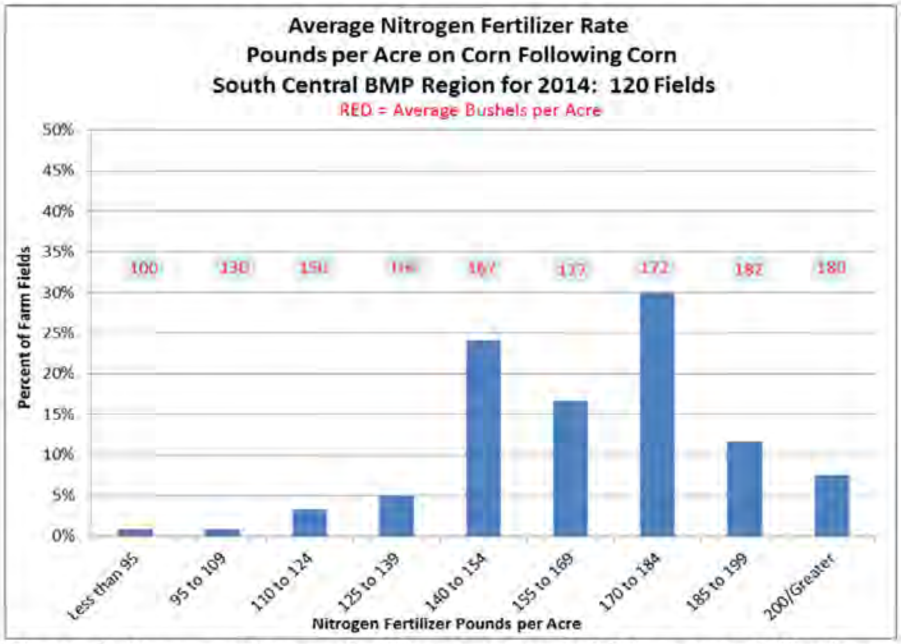


Figure 4. Average nitrogen fertilizer rates and yields on corn following corn in the SC BMP region for 2014: 120 fields.

In the SC BMP region, nitrogen fertilizer rates were an average of 155 pounds per acre in Freeborn County as shown in Table 2.

Table 2. Average county nitrogen fertilizer rates and corn yields for the SC BMP region for corn following corn.

Average County Nitrogen Fertilizer Rates for the SC BMP Region for Corn Following Corn			
County	Number of Farm Fields	Average Nitrogen Rate Pounds per Acre	Average Corn Yield Bushels per Acre
Freeborn	12	167	174

Figure 5 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn following alfalfa; the corresponding corn yields are detailed in red.

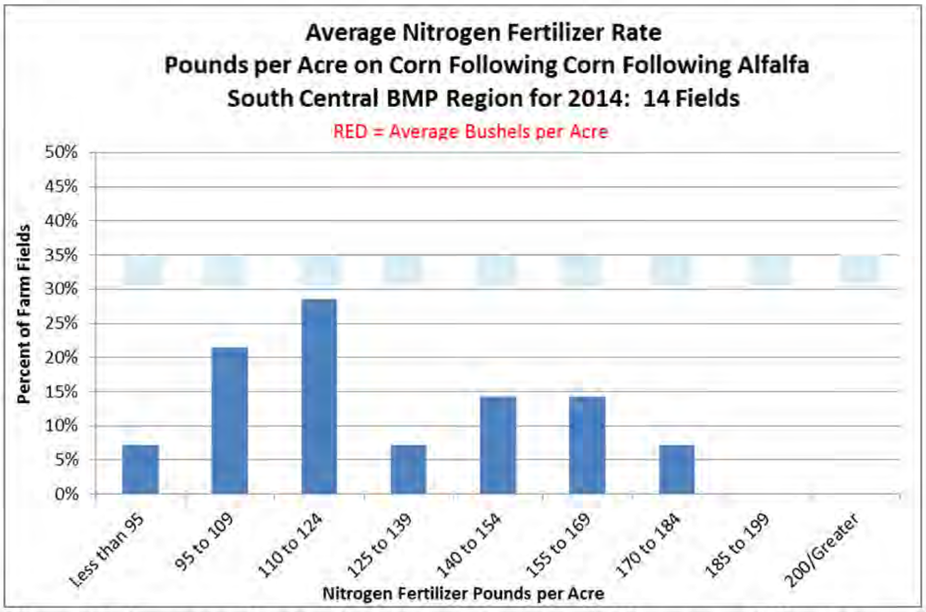


Figure 5. Average nitrogen fertilizer rates and yields on corn following corn following alfalfa in the SC BMP region for 2014: 14 fields.

No counties had five or more responses in SC BMP region.

There were less than five fields that were included in the SC BMP region for corn following alfalfa analysis.

Figure 6 details the distribution of nitrogen fertilizer rates in the SC BMP region for corn following corn following small grains; the corresponding corn yields are detailed in red.

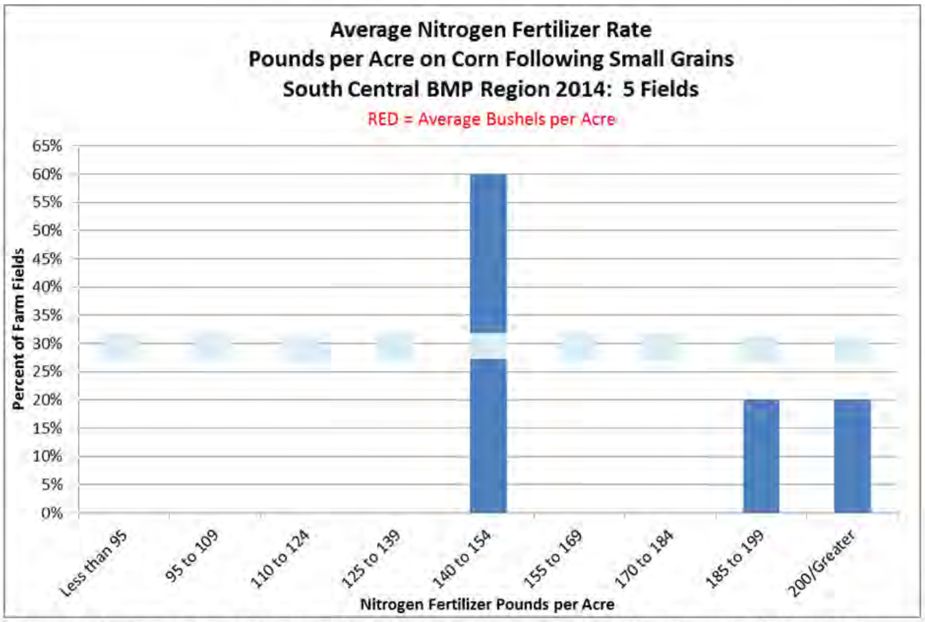


Figure 6. Average nitrogen fertilizer rates and yields on corn following small grains in the SC BMP region for 2014: 5 fields.

No counties had five or more responses in the SC BMP region.

Manure section

Table 3 details the percentage of respondents on if the farmer knew the amount of nitrogen that is in the manure applied for the 2014 corn crop.

Table 3. The farmers' knowledge of nitrogen content of manure being applied for the 2014 corn crop.

BMP Region	Knowledge of the Actual Amount of Nitrogen Applied	Percentage of Respondents
South Central	Yes	38
South Central	No	62

§ Percent was calculated using only those respondents who answered yes or no to the question.

Table 4 details the nitrogen rates and corn yields in South Central BMP region on corn following various crops. These are corn fields applied with manure and commercial nitrogen fertilizer.

Table 4. Average amount of nitrogen applied from manure and commercial nitrogen fertilizer and corresponding corn yields to previous crops by BMP region.

BMP Region	Previous Crop	Average Nitrogen Rate From Manure And Commercial Fertilizer Pounds per Acre	Average Corn Yield Bushels per Acre
South Central	Soybeans	186	179
South Central	Corn	190	181
South Central	Corn/Alfalfa	**	**
South Central	Small Grains	**	**
South Central	Other	**	**

Table 5 details the total amount of nitrogen applied to fields from both manure and commercial nitrogen.

Table 5. Average amount of nitrogen applied to fields from both commercial fertilizer and manure.

BMP Region	Main Source of Manure	Average Nitrogen Rate From Manure And Commercial Fertilizer Pounds per Acre
South Central	All	188
South Central	Dairy	178
South Central	Beef	185
South Central	Hog	**
South Central	Poultry	208
South Central	Other	180

Pesticide Section

Table 6 details the rates and active ingredients from pesticides applied to corn in Pesticide Management Area (PMA) 8.

Table 6. Pesticide applications and rates for corn – PMA 8

Agricultural Chemical (a.i.)	Surveyed Area Applied	Average Appli-cations	Average Rate Per Application	Average Rate Per Crop Year	Total Applied Per Crop Year[1]
	Percent	*Number*	*Pounds per Acre* (a.i.)	*Pounds per Acre* (a.i.)	*Total Pounds* (a.i.)
Herbicides					
Acetochlor	37	1.0	1.25	1.26	65,349
Atrazine	9	1.0	0.52	0.52	6,536
Clopyralid	20	1.0	0.07	0.07	2,055
Dicamba	5	1.0	0.15	0.15	1,081
Diflufenzopyr	5	1.0	0.06	0.06	419
Dimethenamid-p	9	1.0	0.61	0.61	8,193
Flumetsulam	20	1.0	0.03	0.03	835
Glufosinate-ammonium	1	1.0	0.37	0.37	302
Glyphosate	80	1.2	0.93	1.10	123,781
Mesotrione	19	1.0	0.08	0.08	2,053
Nicosulfuron	1	1.0	0.30	0.30	360
Rimsulfuron	1	1.0	0.13	0.13	184
S-metolachlor	14	1.0	0.86	0.87	17,242
Saflufenacil	4	1.0	0.07	0.07	427
Tembotrione	4	1.0	0.08	0.08	379
Topramezone	3	1.0	0.02	0.02	63
Insecticides					
Bifenthrin	11	1.1	0.06	0.07	1,032
Chlorpyrifos	1	1.0	0.40	0.40	696
Cyfluthrin	4	1.0	0.01	0.01	37
Lambda-cyhalothrin	1	1.0	0.02	0.02	18
Phostebupirim	4	1.0	0.13	0.13	742
Tefluthrin	3	1.7	0.11	0.19	931
Fungicides					
Azoxystrobin	1	1.0	0.08	0.08	89
Fluxapyroxad	2	1.0	0.67	0.67	1,488
Metconazole	2	1.1	0.03	0.04	103
Propiconazole	3	1.2	0.04	0.04	198
Prothioconazole	2	1.0	0.09	0.09	212
Pyraclostrobin	8	1.0	0.33	0.33	3,850
Tebuconazole	2	1.0	0.09	0.09	212

[1] Data in this column is calculated from “raw” data and represents the total pounds of active ingredient applied to the indicated crop(s) in 2013 by survey participants in this area. Data in this table and the selection of survey participants was not statistically "weighted" in any fashion. Thus, inappropriate extrapolation of the data may over- or under-estimate the total pounds of a.i. used at the state, area or sub-area levels.

9

Herbicides applied but not published included the following: 2,4-D, Bromoxynil, Cloransulam, Flumioxazin, Fluroxypyr, Fluthiacet-methyl, Pendimethalin, Primisulfuron, Sethoxydim , and Triencarbazone-methyl.
Insecticides applied but not published included the following: Gamma-cyhalothrin and Terbufos.
Fungicides applied but not published included the following: Trifloxystrobin.

Table 7 details the rates and active ingredients from pesticides applied to soybeans in Pesticide Management Area (PMA) 8.

Table 7. Pesticide applications and rates for soybean – PMA 8

Agricultural Chemical (a.i.)	Surveyed Area Applied	Average Appli-cations	Average Rate Per Application	Average Rate Per Crop Year	Total Applied Per Crop Year[1]
	Percent	*Number*	*Pounds per Acre* (a.i.)	*Pounds per Acre* (a.i.)	*Total Pounds* (a.i.)
Herbicides					
Clethodim	3	1.2	0.05	0.07	210
Cloransulam	13	1.0	0.02	0.02	304
Dimethenamid-p	2	1.0	0.36	0.36	765
Fluazifop	2	1.1	0.09	0.10	220
Flumioxazin	2	1.0	0.13	0.13	301
Fluthiacet-methyl	3	1.0	0.00	0.00	15
Fomesafen	8	1.0	0.18	0.18	1,390
Glufosinate-ammonium	1	1.5	0.36	0.54	549
Glyphosate	92	1.6	0.97	1.52	140,498
Imazethapyr	4	1.0	0.05	0.05	228
Lactofen	2	1.0	0.14	0.14	230
Metribuzin	2	1.0	0.29	0.29	439
S-metolachlor	3	1.0	0.91	0.91	2,683
Saflufenacil	3	1.0	0.03	0.03	101
Sulfentrazone	14	1.0	0.18	0.18	2,546
Thifensulfuron	1	1.0	0.01	0.01	4
Trifluralin	1	1.0	0.50	0.50	310
Insecticides					
Beta-cyfluthrin	3	1.0	0.02	0.02	61
Bifenthrin	9	1.0	0.06	0.06	595
Chlorpyrifos	18	1.0	0.46	0.46	8,191
Esfenvalerate	2	1.0	0.04	0.04	85
Gamma-cyhalothrin	4	1.0	0.01	0.01	36
Imidacloprid	3	1.0	0.05	0.05	123
Lambda-cyhalothrin	19	1.0	0.02	0.02	420
Thiamethoxam	1	1.0	0.03	0.03	30
Zeta-cypermethrin	4	1.0	0.02	0.02	63
Fungicides					
Azoxystrobin	4	1.0	0.11	0.11	512
Propiconazole	4	1.0	0.05	0.05	167
Pyraclostrobin	9	1.0	0.12	0.12	1,111

Agricultural Chemical (a.i.)	Surveyed Area Applied	Average Appli-cations	Average Rate Per Application	Average Rate Per Crop Year	Total Applied Per Crop Year[1]
Tetraconazole	1	1.0	0.06	0.06	72
Trifloxystrobin	3	1.0	0.04	0.04	129

[1] Data in this column is calculated from "raw" data and represents the total pounds of active ingredient applied to the indicated crop(s) in 2013 by survey participants in this area. Data in this table and the selection of survey participants was not statistically "weighted" in any fashion. Thus, inappropriate extrapolation of the data may over- or under-estimate the total pounds of a.i. used at the state, area or sub-area levels.

Herbicides applied but not published included the following: Acetochlor, Bentazon, Chlorimuron, Dicamba, Fenoxaprop, Flufenacet, Flumiclorac, Imazamox, Pendimethalin, and Phenmedipham.
Fungicides applied but not published included the following: Chlorothalonil and Fluoxastrobin.

Table 8 details the rates and active ingredients from pesticides applied to wheat in Pesticide Management Area (PMA) 8.

Table 8. Pesticide applications and rates for wheat – PMA 8

Agricultural Chemical (a.i.)	Surveyed Area Applied	Average Appli-cations	Average Rate Per Application	Average Rate Per Crop Year	Total Applied Per Crop Year[1]
	Percent	*Number*	*Pounds per Acre* (a.i.)	*Pounds per Acre* (a.i.)	*Total Pounds* (a.i.)
Herbicides					
2,4-D	51	1.0	0.48	0.48	367
Bromoxynil	21	1.0	0.20	0.20	125
Fungicides					
Pyraclostrobin	22	1.0	0.10	0.10	14

[1] Data in this column is calculated from "raw" data and represents the total pounds of active ingredient applied to the indicated crop(s) in 2013 by survey participants in this area. Data in this table and the selection of survey participants was not statistically "weighted" in any fashion. Thus, inappropriate extrapolation of the data may over- or under-estimate the total pounds of a.i. used at the state, area or sub-area levels.

Herbicides applied but not published included the following: Fenoxaprop, MCPA, Pyrasulfotole, Thifensulfuron, Tribenuron, and Triencarbazone-methyl.
Insecticides applied but not published included the following: Chlorpyrifos and Lambda-cyhalothrin.
Fungicides applied but not published included the following: Propiconazole, Prothioconazole, Tebuconazole, and Trifloxystrobin.

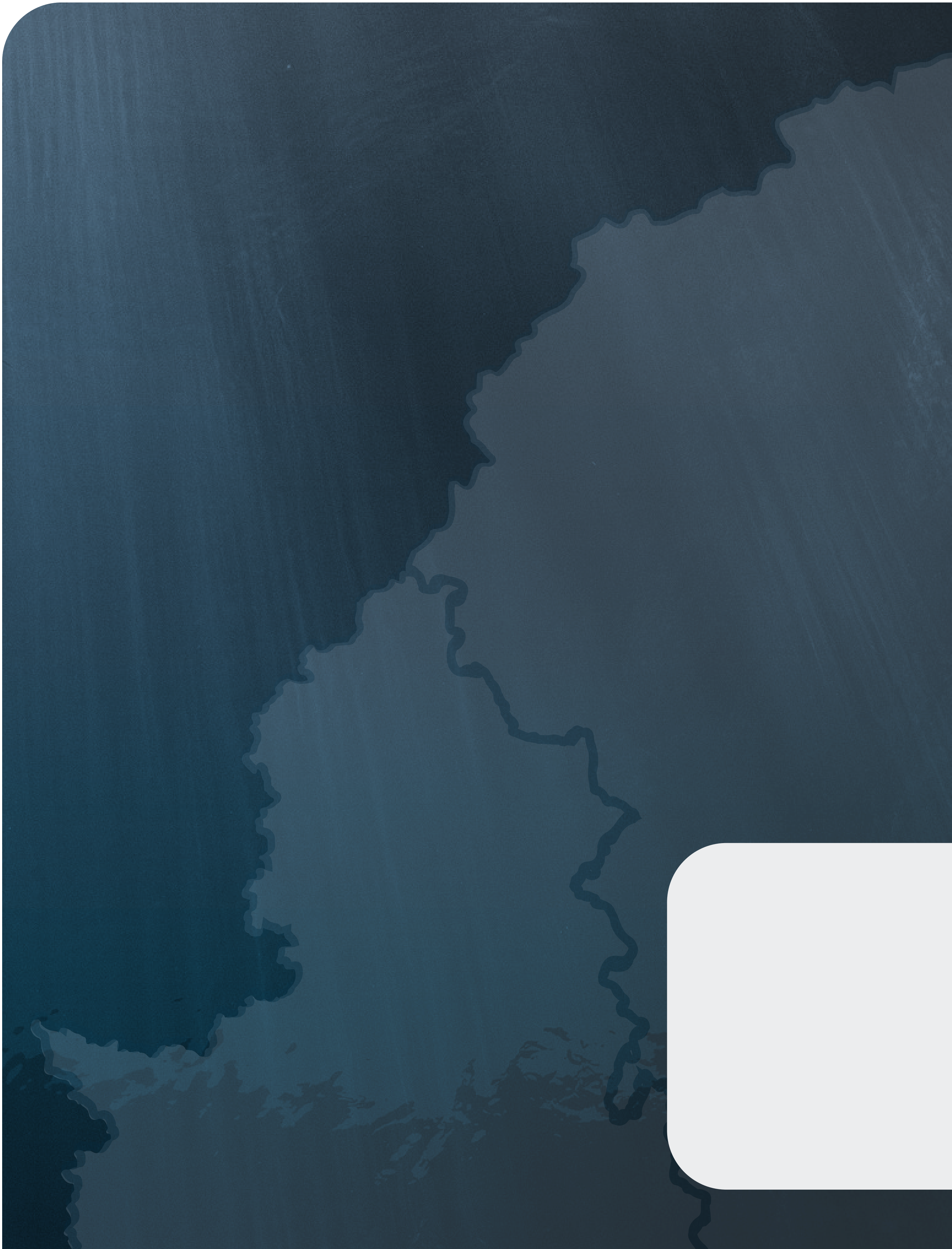
Table 9 details the rates and active ingredients from pesticides applied to hay in Pesticide Management Area (PMA) 8.

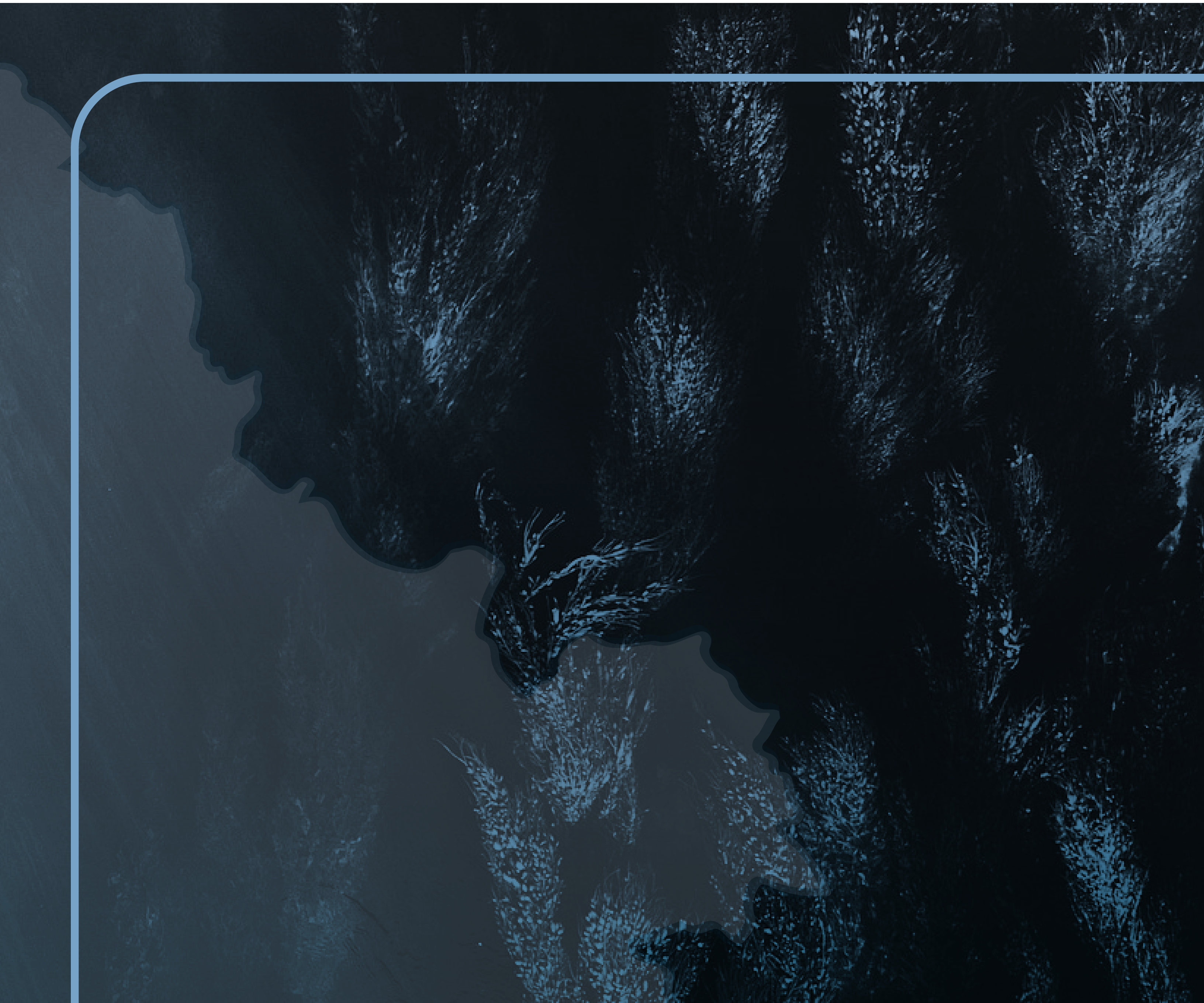
Table 9. Pesticide applications and rates for hay – PMA 8

Agricultural Chemical (a.i.)	Surveyed Area Applied	Average Appli-cations	Average Rate Per Application	Average Rate Per Crop Year	Total Applied Crop Year[1]
	Percent	*Number*	*Pounds per Acre* (a.i.)	*Pounds per Acre* (a.i.)	*Total Pounds* (a.i.)
Insecticides					
Chlorpyrifos	2	1.0	0.33	0.33	57
Lambda-cyhalothrin	10	1.0	0.03	0.03	25

[1] Data in this column is calculated from "raw" data and represents the total pounds of active ingredient applied to the indicated crop(s) in 2013 by survey participants in this area. Data in this table and the selection of survey participants was not statistically "weighted" in any fashion. Thus, inappropriate extrapolation of the data may over- or under-estimate the total pounds of a.i. used at the state, area or sub-area levels.

Herbicides applied but not published included the following: 2,4-D, Aminopyralid, Clopyralid, and Imazamox.
Insecticides applied but not published included the following: Gamma-cyhalothrin.
Fungicides applied but not published included the following: Pyraclostrobin.





APPENDIX C
DATA AND COMMENTS

APPENDIX C: DATA AND COMMENTS

Appendix C presents all issues and concerns identified in the early stages of the planning process. The issues and concerns were taken from previous studies completed for the planning area as well as public and committee feedback. These issues and concerns were used as the starting point for the prioritization process that resulted in the priority issue statements presented in this plan.

1W1P Document

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
BWSR response to notification Shell Rock Winnebago.docx	Wetlands – Protection and restoration of wetlands provides benefits for water quality, flood damage reduction, and wildlife habitat. The plan should support the continued implementation of the Wetland Conservation Act and look for opportunities to improve coordination across jurisdictional boundaries. The plan should also identify high priority areas for wetland restoration and strategically target restoration projects to those areas. The Restorable Wetland Prioritization Tool is an example resource that can be used to help identify such areas. The state is embarking on a new wetland prioritization plan that will guide wetland mitigation in the future. Wetland restoration and preservation priorities in this plan may be eligible for inclusion in this plan in the future. Please refer to the attached document "Shell Rock River and Winnebago 1W1P Wetland Section Comments" for further information on this program and additional considerations regarding wetlands.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Conservation Easements – The State's Re-Invest in Minnesota (RIM) Reserve easement program and the Conservation Reserve Enhancement Program (CREP), in partnership with the United States Department of Agriculture (USDA), considers several site specific and landscape scale factors when funding applications. Though it is dependent on specific program terms, the State considers local prioritization of areas for easement enrollment. The plan should take into account areas with a higher risk of contributing to surface and subsurface water degradation, such as highly erosive lands and wellhead protection areas that would benefit from being placed under permanent vegetative cover. Another factor to consider is that in the next 3 years (2019-2021) nearly 6,000 acres of Conservation Reserve Program (CRP) practices are scheduled to expire within the partnership's counties. The plan should recognize the potential impact these expiring contracts may have in the planning area and consider prioritizing working with producers regarding the management of those acres.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Soil Health – The majority of the land use in the Shell Rock and Winnebago River planning area is agriculture. The concept and the associated practices of soil health have the potential to positively change the interaction of agriculture and the natural system at the soil level. Common soil health practices include the use of reduce or no tillage, the use of cover crops, increased areas of continuous living cover, and extended crop rotations. Improving soil health can help decreased soil erosion, increase water infiltration, provide nutrient scavenging, and increase soil organic matter. In addition, there seems to be increased interest from landowners and operators about soil health. It is recommended that these soil health practices be prioritized for implementation in the plan.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	GRAPS - The Groundwater Restoration and Protection Strategies (GRAPS) for the Shell Rock and Winnebago River watersheds is currently under development by the MDH and will be available in the near future. This report will help identify specific groundwater issues in the planning area and ideas for implementation actions to address these issues. These ideas should be vetted by the planning group and a set of them should be incorporated in the plan.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	WRAPS - The Watershed Restoration and Protection Strategies (WRAPS) for the Shell Rock River and Winnebago River Watersheds are currently in development by the MPCA. In the meantime, reports related to the development of the WRAPS should be reviewed and incorporated into your planning effort. These reports (the Monitoring and Assessment report and the Stressor Identification report) can be found here: Shell Rock and Winnebago.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Protecting Pollinator Populations - Projects should identify opportunities to benefit pollinator populations through creating areas of refuge and providing floral resources that can benefit a wide range of pollinators. Governor Walz recently signed a new Executive Order "Restoring Healthy, Diverse Pollinator Populations that Sustain and Enhance Minnesota's Environment, Economy, and Way of Life" that directs efforts of the Interagency Pollinator Protection Team. This team recently released a Minnesota State Agency Pollinator Report that outlines state agency priorities. There is also a BWSR Pollinator Toolbox that provides guidance for project planning, implementation and management. Invasive Species and Landscape Management: A cooperative approach across the watershed is recommended for invasive species management to address invasive species and weed issues across geographic and ownership boundaries. Invasive species should be prioritized based on their risk to ecosystems, agriculture, recreation, and human health. There should also be a focus on emerging weed threats such as Palmer amaranth that pose a significant risk to agricultural production. Adaptive management strategies should be used to address invasive species and also maintain ecological functions and services within landscapes.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Urban Stormwater/MS4s – Urban stormwater runoff frequently contains pollutants such as pesticides, fertilizers, sediment, salt, and other debris, which can contribute to excess algae growth and poor water clarity/quality in our water resources. Poorly managed urban stormwater can also drastically alter the natural flow and infiltration of water, scour stream banks and harm or eliminate aquatic organisms and ecosystems. A Municipal Separate Storm Sewer System (MS4) General Permits is owned/operated by the city of Albert Lea within the planning area. This MS4s has accepted an invitation to be on the Policy Committee in the planning effort which should ensure that their Stormwater Pollution Prevention Programs are incorporated into the plan.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Data Collection and Monitoring – A thorough review of existing data and monitoring is required as a component of the plan. Identification of data or monitoring needs can then be incorporated into implementation activities in order to help measure progress toward plan goals.	Yes		Strategy

1W1P Document 1 of 1

1W1P Process

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Minnesota Water Research Digital Library There may be other water studies specific to this watershed that may be helpful to review and reference in the 1W1P process. See: https://www.mda.state.mn.us/protecting/cleanwaterfund/toolstechnology/mnwrl			
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Current water quality conditions for both lakes and streams point to a need for significant land use changes to reserve the pollutant loading trends. Work to address water quality goals established in WRAPS and TMDLs to prevent future surface water quality impairments and groundwater contamination, improve fish habitat in lakes and streams, and promote the watershed's resilience to changing hydrology and climate, invasive species, and other stressors.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Drainage - The drainage authorities within the planning area should be included as stakeholders in the plan development process. This inclusion should ensure that the Chapter 103E processes and proceedings as well as the extent and the limitations of drainage authority responsibility are adequately included in the final plan. Additionally, the planning partners are strongly encouraged to include projects and activities consistent with multipurpose drainage criteria outlined in Minnesota Statutes §103E.011, Subd. 1a and §103E.015, Subd. 1. Refer to the attached document "Chapter 103E Drainage System Consideration for 1W1P" for additional information on 103E Drainage Authority responsibility, authority and opportunity for participating in the planning of conservation practices involving public drainage systems.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Landscape Resiliency and Climate Adaption – BWSR strongly encourages your planning partnership to consider the potential for more extreme weather events and their implications for the water and land resources of the watershed in the analysis and prioritization of issues. The weather record for the planning area shows increased frequency and severity of extreme weather events, which has a direct effect on local water management. Adjustments involving conservation and fieldwork planning and implementation should be explored; for instance, the use of an updated precipitation frequency chart such as the NOAA Atlas 14 when designing conservation projects. An additional source of information for use in the planning process is the BWSR Landscape Resiliency Toolbox. Finally, a new white paper from the Minnesota Interagency Climate Adaptation Team titled "Building Resiliency to Extreme Precipitation in Minnesota" also provides resiliency strategies related to this topic.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Local Controls - Gaps or inconsistencies in local ordinances, policies, or enforcement could affect the success of your plan's implementation. Redetermination of benefits on drainage systems, SSTS compliance inspection requirements (property transfer, variance, etc.), level 3 feedlot inventories, and shoreland regulations are some examples that should be explored during plan development.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	WRAPS - The Watershed Restoration and Protection Strategies (WRAPS) for the Shell Rock River and Winnebago River Watersheds are currently in development by the MPCA. In the meantime, reports related to the development of the WRAPS should be reviewed and incorporated into your planning effort. These reports (the Monitoring and Assessment report and the Stressor Identification report) can be found here: Shell Rock and Winnebago.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	If wetland restoration projects become part of a local implementation plan they should be focused on restoring, to the greatest extent practicable, pre-disturbance conditions with respect to hydrology and vegetation. Restoration projects that are focused on a single function or service should be less of a priority than those that focus on the suite of functions provided by these resources. Also, restoration efforts should attempt to restore self-sustaining systems that are not reliant on structures and/or routine management and operation.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	The Shell Rock and Winnebago River watersheds, and the larger BSA 8, currently have a low supply of wetland bank credits. This is true both for the general public and the Local Government Road Wetland Replacement Program (LGRWRP). The low balance of credits could result in replacement for wetland impacts being exported out of the watershed which further reduces the ability of the landscape, and wetlands in particular, to perform functions at even a basic level. Through the CPF development process BWSR intends to identify priority areas where future wetland restorations would have the highest potential for success and also the greatest potential benefit to the watershed. This process could work closely with the 1W1P process to take advantage of these comprehensive planning efforts and identify wetland restoration priority areas that address multiple watershed management objectives.	Yes		Strategy

Climate Change and Resilience

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Increasing Precipitation Trend			Concern
Watershed Climate Summary: Shell Rock River	Slight Climate Change			Concern
Watershed Climate Summary: Winnebago	Slight Climate Change			Concern
Shell Rock River Watershed Water Management Plan	Extreme weather events			Concern
BWSR response to notification Shell Rock Winnebago.docx	Landscape Resiliency and Climate Adaption – BWSR strongly encourages your planning partnership to consider the potential for more extreme weather events and their implications for the water and land resources of the watershed in the analysis and prioritization of issues. The weather record for the planning area shows increased frequency and severity of extreme weather events, which has a direct effect on local water management. Adjustments involving conservation and fieldwork planning and implementation should be explored; for instance, the use of an updated precipitation frequency chart such as the NOAA Atlas 14 when designing conservation projects. An additional source of information for use in the planning process is the BWSR Landscape Resiliency Toolbox. Finally, a new white paper from the Minnesota Interagency Climate Adaptation Team titled "Building Resiliency to Extreme Precipitation in Minnesota" also provides resiliency strategies related to this topic.	Yes		Concern
Kickoff	Learning how to adapt to climate change			Concern

Climate Change and Resilience 1 of 1

Contaminants of Emerging Concern

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	Increasing Nitrate-N Levels			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Tile Drainage			Concern
Winnebago River Watershed Stressor Identification Report	High Nitrate			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Nitrate in Groudwater is a Concern			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	42% of Wetlands are in Poor Condition			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Tile Drainage			Concern
Shell Rock River Watershed Water Management Plan	NitrateN concentrations have also increased in the Shell Rock River in recent years.		Shell Rock River	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Residents of the Albert Lea Lake watershed rely on groundwater for drinking water supply			Concern
Survey	Sedimentation and phosphorus			Concern
Survey	Runoff, chemicals			Concern
Survey	Pollution from all sources including farm runoff and any solid things that were dumped into the lakes by manufacturers.Algae!!!!Pollution from an abundance of Canada geese.			Concern
Survey	Abundant nutrient oversupply on the lake and river bottoms (i.e. Fountain Lake) is fueling rapid growth of duckweed and other aquatic plants with mediocre water quality visibility.Much of the extra nutrients is in the form of extra material that has accumulated over the years in part from over application of chemicals sprayed by farmers in addition to the lack of preventative measures such as filters at the entry points into the waterways. These extra nutrients and artificially shallow lake bottom is resulting in a reduced health in the ecosystem most noticeable in Bancroft Bay of Fountain lake.Early in the season before the entire bay is covered in duckweed and aquatic leaves, there is significant fish and bird activity. Once the Duckweed growth kicks in, the fish mostly depart this bay and birds (specifically Pelicans) move to Albert Lea Lake in portions that are not covered in duckweed. Beyond the ecosystem concerns this excessive growth has reduced/limited recreation abilities in at least Fountain Lake (that I can speak to).Duckweed flows regularly from Bancroft Bay into the Boathouse channel by the main boat launch.This has caused many (including myself) economic harm and reduce enjoyment of area watershed resources. Specifically after a large rain this year, a massive "bank" of duckweed got pushed down the channel to the boat launch and to the end by the entry to the main lake, which has remained for months. In one instance, every boat in front/back of us had to drive through this thick duckweed, six in total that I observed. The motor on every single boat had troubles accelerating (sputtered/died) on the main lake as the duckweed got into the cooling systems. One of my neighbor's boat motors was completely ruined (had to get replaced) and personally after this I spent hundreds on a new trolling motor so I could "troll" through this junk with an electronic motor and not harm my main boat motor. While many of these plants are native, the extent of the growth we are seeing is not and is causing ecosystem and recreation concerns, prohibiting use of public launches and waterways leading to economic harm to resident and visitor property.		Fountain Lake, Albert Lea Lake	Concern
Survey	Farming run off, all run off from streets and vehicles			Concern
Survey	Increasing scale of agriculture including non-natural inputs that degrade soil health, lack of understanding of causes, increased urban and impervious surfaces without equal consideration to water quality.			Concern
Kickoff	Clean environment free of litter			Value
Kickoff	(phosphorous) Chemicals, lawns, farms, business, run-off			Concern
Kickoff	Surface water carrying soil and pollutants into our lakes and streams - ditches			Concern
Kickoff	This watershed is a collection bowl. We need to be aware that what we put in affects our local environment.			Concern
Kickoff	Lake shore homeowner responsibility for grass fertilizer, erosion, garbage			Value

Land Development & Changes

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	Conversion of native landscape into row crop agriculture, housing			Concern
Kickoff	Growing population = less nature because of more peeps			Concern
Kickoff	Expanding urban development and development of lakeshore and riparian/natural areas			Concern
Kickoff	Urban sprawl			Concern
Kickoff	Land management practices - clear cutting shorelines, improper tree management and removal			Concern
Kickoff	Landscaping of shorelines			Concern
Kickoff	I care about the beauty of nature. Making sure buildings don't take over. Protect nature.			Value
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Enhance the administration of the local shoreland zoning ordinance so controls are implemented and the adjacent surface water resource is restored, enhanced, or protected from development pressures	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Altered Hydrology/Flooding/Water Quantity – The hydrologic conditions of the watersheds in this planning area have changed over time. In recent decades more precipitation, more runoff, and more runoff per unit of precipitation has been observed as well as more frequent periods of extremely low flow in some watercourses. These hydrologic changes as well as others have contributed to instability of natural and artificial watercourses, degradation of wetland habitats, loss of agricultural productivity, and increased the risk of flood damages. Recognizing altered hydrology as a priority issue in the plan will help ensure that a driving factor behind many related issues is directly addressed.	Yes		Strategy

Land Development and Changes 1 of 1

Reduce Pesticide & Fertilizer Impacts

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Groundwater Monitoring Wells The MDA samples one monitoring well in the Shell Rock and Winnebago Rivers Watershed. Monitoring at this well began in 2013 and it is sampled twice a year. Pesticide and nitrate data is available for the well. Semiannual and hourly water level measurements are also available for the site. Nine different pesticides or pesticide breakdown products (or degradates) have been detected in this well. None have exceeded human health reference values. Nitrate-nitrite (nitrate) has been detected in the well. The nitrate concentrations range from 2 to 60 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L. Monitoring of this site is expected to continue into the future.			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Surface Water Monitoring The MDA has completed six pesticide and/or nutrient water quality sample collection events from six river and stream locations within the Shell Rock River and Winnebago River Watershed from 2010-2011. There are currently no pesticide water quality impairments in the watershed.			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Lawn Fertilizer Contributions			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Animal Manure Contributions			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Land Cover Dominated by Row Crop Agriculture			Concern
Survey	Pollution from all sources including farm runoff and any solid things that were dumped into the lakes by manufacturers.Algae!!!!Pollution from an abundance of Canada geese.			Concern
Survey	Runoff, farm chemicals, carp and additional drainage.			Concern
Kickoff	Regulating the use of pesticides, not only for farmers but city land owners, too, on their lawns			Value
Kickoff	Reduce chemical usage on lawns			Value
Kickoff	Over use of chemicals			Concern
Kickoff	Chemical runoff from farm lands			Concern
Kickoff	Water pollution, chemical runoff, urban and rural			Concern
Kickoff	Impacts from tile drainage (nutrients) causing issues in streams			Concern
Kickoff	Ag drainage expansion			Concern
Kickoff	Over-use of chemicals (algal blooms)			Concern
Kickoff	GMO crops			Concern
Kickoff	Pesticides (one is mosquito control)			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Heavily Utilized for Ag Production (78 Percent of Landscape)			Strategy
Shell Rock River Watershed Monitoring and Assessment Report	Manure Management Issue			Strategy
Survey	Dredging all parts of Fountain Lake.A "catch" basin for storm drain runoff.Eliminate farm and yard runoff into the lakes		Fountain Lake	Strategy
Survey	In Phase 2 of the Fountain Lake dredging project, dredging of all upstream sources should be completed first (Edgewater Bay-done, developed part of Bancroft Bay and Dan's Bay) before dredging the "main" lake portion. Otherwise, the upstream nutrients will keep "refilling" the dredged areas reversing any progress that was gained by the dredge. This approach will help reduce the continual flow of excess nutrients and aquatic weeds that regularly is "fed" from these bays and pushes to the main lake/boat launches causing many challenges. In addition, growing the network of filtration methods of water being fed into the rivers/lakes and expand efforts to work with farmers to eliminate any excess nutrients from fertilizers contributing to the excessive growth challenges are both critical approaches as well.		Fountain Lake	Strategy

Drinking Water Supply

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Health Initial Comment Letter - 6/24/2019	Prioritize existing and future Drinking Water Supply Management Areas (DWSMA) in the Shell Rock River and Winnebago River Watershed 1W1P.	yes		Concern
Minnesota Department of Health Initial Comment Letter - 6/24/2019	Prioritize protection of private wells	yes		Concern
Minnesota Department of Health Initial Comment Letter - 6/24/2020	Prioritize protecting noncommunity public water supplies	yes		Concern
Minnesota Department of Health Initial Comment Letter - 6/24/2021	Focus on potential land use contaminant sources that may impact water quality		Albert Lea, Glenville	Concern
Minnesota Department of Health Initial Comment Letter - 6/24/2022	Focus on sealing of unused wells and old public water supply wells (funding available from MDH)	yes	Elmwood Terrace Twin Lakes Manchester Hayward Conger Emmons	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Residents of the Albert Lea Lake watershed rely on groundwater for drinking water supply			Concern
Winnebago River and Upper Wapsipinicon River Watershed	Surface Water and Groundwater Closely Connected in Karst Areas			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Karst Aquifers Difficult to Protect			Concern
Winnebago River and Upper Wapsipinicon River Watershed	13.3% of New Wells Arsenic Above Maximum Contaminent Levels			Concern
Minnesota Pollution Sensitivity of Near-Surface Materials	Karst Aquifers Difficult to Protect			Concern
Minnesota Pollution Sensitivity of Bedrock Surface	Mower County: 2 Areas of Moderate Sensitivity of Bedrock Surface			Concern
Kickoff	I care about the water quality of the water that comes out of the tap in my house			Value
Kickoff	To have continued clean drinkable water			Value

Drinking Water Supply

1 of 1

Groundwater Quality

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Township Testing Program (TTP) As part of the NFMP, the MDA designed the Township Testing Program (TTP) to determine current nitrate-nitrogen concentrations in private wells within areas that are vulnerable to groundwater contamination.			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Private Well Pesticide Sampling (PWPS) The MDA began evaluating pesticide presence and magnitude in private residential drinking water wells as part of the Private Well Pesticide Sampling (PWPS) Project in 2014 as a companion program to the MDA Township Testing Program (TTP). Wells in one township in Freeborn County (Mansfield Township) will be sampled in 2020 as part of the PWPS Project. As such, there is no chemistry data available at this time. When sampling is offered and performed, it is anticipated that the contract lab will analyze for approximately 125 pesticide compounds and nitrate. More information is available at: www.mda.state.mn.us/pwps		Mansfield Township	Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Groundwater Monitoring Wells The MDA samples one monitoring well in the Shell Rock and Winnebago Rivers Watershed. Monitoring at this well began in 2013 and it is sampled twice a year. Pesticide and nitrate data is available for the well. Semiannual and hourly water level measurements are also available for the site. Nine different pesticides or pesticide breakdown products (or degradates) have been detected in this well. None have exceeded human health reference values. Nitrate-nitrite (nitrate) has been detected in the well. The nitrate concentrations range from 2 to 60 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L. Monitoring of this site is expected to continue into the future.			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Pesticide Water Quality Monitoring The Minnesota Department of Agriculture (MDA) has been conducting pesticide monitoring in ground water since 1985, and in surface waters since 1991.			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Nitrogen Fertilizer Management Plan (NFMP) The NFMP is the state's blueprint for preventing or minimizing the impacts of nitrogen fertilizer on groundwater. The primary goal of the NFMP is to involve local farmers and agronomists in problem-solving to address elevated levels of nitrate in groundwater.			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2023	Township Testing Program (TTP) As part of the NFMP, the MDA designed the Township Testing Program (TTP) to determine current nitrate-nitrogen concentrations in private wells within areas that are vulnerable to groundwater contamination.			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2024	Private Well Pesticide Sampling (PWPS) The MDA began evaluating pesticide presence and magnitude in private residential drinking water wells as part of the Private Well Pesticide Sampling (PWPS) Project in 2014 as a companion program to the MDA Township Testing Program (TTP). Wells in one township in Freeborn County (Mansfield Township) will be sampled in 2020 as part of the PWPS Project. As such, there is no chemistry data available at this time. When sampling is offered and performed, it is anticipated that the contract lab will analyze for approximately 125 pesticide compounds and nitrate. More information is available at: www.mda.state.mn.us/pwps			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2025	Pesticide Water Quality Monitoring The Minnesota Department of Agriculture (MDA) has been conducting pesticide monitoring in ground water since 1985, and in surface waters since 1991.			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2026	Groundwater Monitoring Wells The MDA samples one monitoring well in the Shell Rock and Winnebago Rivers Watershed. Monitoring at this well began in 2013 and it is sampled twice a year. Pesticide and nitrate data is available for the well. Semiannual and hourly water level measurements are also available for the site. Nine different pesticides or pesticide breakdown products (or degradates) have been detected in this well. None have exceeded human health reference values. Nitrate-nitrite (nitrate) has been detected in the well. The nitrate concentrations range from 2 to 60 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L. Monitoring of this site is expected to continue into the future.			Concern

Groundwater Quality 1 of 2

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	High Capacity Withdrawls Groundwater Withdrawls 85% Municipal, 13% Industrial, 2% Irrigation			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Nitrate in Groudwater is a Concern			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Surface Water and Groundwater Closely Connected in Karst Areas			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Karst Aquifers Difficult to Protect			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	GW High in Trace Elements			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	13.3% of New Wells Arsenic Above Maximum Contaminent Levels			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	High Capacity Withdrawls Groundwater Withdrawls Mostly Irrigation, Livestock, then Water Supplies			Concern
Minnesota Pollution Sensitivity of Near-Surface Materials	Karst Aquifers Difficult to Protect			Concern
Minnesota Pollution Sensitivity of Bedrock Surface	Mower County: 2 Areas of Moderate Sensitivity of Bedrock Surface			Concern
Survey	Water quality, but usable water, not so much vegetation			Value
Survey	clean water -- soil erosion- soil health - wildlife habitat			Value
Survey	Clean water, less runoff and long term damage and more native plantings. Also, the improvement in fish species in our area have been awesome for the area.			Value
Kickoff	I care about how clean the water across the landscape is			Value
Kickoff	Clean water - both for drinking and in our lakes and streams			Value
Kickoff	Clean water drinking and lakes			Value
Kickoff	Water quality			Value
Kickoff	Water quality			Value
Kickoff	Good water quality			Value
Kickoff	Clean water surface and groundwater. Drinkable, swimmable and fishable			Value
Kickoff	To have continued clean drinkable water			Value
Kickoff	In regards to our community (FC) natural environment I care about: 1. having clean/pure/safe water to drink on a continous basis, 2. Our parks, state park to visit, see wild animals, birds and native plants, 3. Our local parks where kids can play, 4. clean, pure air, 5. clean lakes in our community where we as citizens do NOT DUMP waste, plastic, paper etc in water or on land, cigarettes			Value
Kickoff	Major concern of clean water and safe water for humans, fish and animals			Concern
Kickoff	Water pollution			Concern
Kickoff	Nitrates getting in groundwater			Concern

Groundwater Quality

2 of 2

Groundwater Quantity

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	High Capacity Withdrawls Groundwater Withdrawls Mostly Irrigation, Livestock, then Water Supplies			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Low groundwater volume			Concern

Infiltration & Recharge

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Low groundwater volume			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Groundwater infiltration and aquifer vulnerability	Yes		Concern

Infiltration and Recharge

1 of 1

Protect Groundwater Resources

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Health Initial Comment Letter - 6/24/2019	Prioritize existing and future Drinking Water Supply Management Areas (DWSMA) in the Shell Rock River and Winnebago River Watershed 1W1P.	yes		Concern
Minnesota Department of Health Initial Comment Letter - 6/24/2020	Prioritize sealing abandoned wells	yes		Value
Minnesota Department of Health Initial Comment Letter - 6/24/2021	Nitrates and pesticides in groundwater are the priority resource concerns for the MDA statewide. In the Shell Rock River and Winnebago River watershed, MDA has limited data to suggest this is a concern in the watershed	yes		Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Proposed Groundwater Protection Rule The proposed Groundwater Protection Rule was developed by the MDA with significant stakeholder engagement over the past several years. Scheduled to go into effect in 2020; one of the impacts in the Shell Rock River and Winnebago Watershed will be the prohibition of fall and frozen soil application of nitrogen fertilizer in vulnerable groundwater areas and DWSMAs with wells with high nitrate. The			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #1 - Protect aquifer from contimination by water wells	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #2 - Protect groundwater from depletion and degradation	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #1 - Protect surface water and groundwater from SSTS contamination (Feedlots)	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #2 - Protect surface water and groundwater resources from feedlot/animal waste contamination	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #4 - Protect surface water and groundwater from mixed solid waste contamination	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #5 - Protect surface water and groundwater from hazardous waste pollution	yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2022	Goal #1 - Protect surface water and groundwater from municipal wastewater and stormwater contamination	yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Abandoned wells			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Land use and hazardous byproducts			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Non-point source runoff			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Improper design. Location, installation, use and maintenance of SSTS can result in significant pollutant source to surface and groundwater			Concern

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Feedlots	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Pollution hazard from failing SSTS	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Groundwater infiltration and aquifer vulnerability	Yes		Concern
BWSR response to notification Shell Rock Winnebago.docx	GRAPS - The Groundwater Restoration and Protection Strategies (GRAPS) for the Shell Rock and Winnebago River watersheds is currently under development by the MDH and will be available in the near future. This report will help identify specific groundwater issues in the planning area and ideas for implementation actions to address these issues. These ideas should be vetted by the planning group and a set of them should be incorporated in the plan.	Yes		Strategy

Protect Surface Water Resources

2 of 2

Administrative Priorities

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	Sustainability --> "what we do today IMPACTS tomorrow!"			Value
Kickoff	I care about the DNR management of Bear Lake		Bear Lake	Value
Kickoff	Politics			Concern
Kickoff	Lack of urgency to act			Concern
Kickoff	How to maintain the concerns and needs of the Winnebago watershed			Concern
Kickoff	Fixing problems from the past in a way that does no further harm			Concern
Kickoff	How to have the good parts of our natural resources to be saved and enjoyed by future generations			Concern
Kickoff	An environment that is in a state where future generations can enjoy (leave environment better than before)			Value
BWSR response to notification Shell Rock Winnebago.docx	The Nonpoint Priority Funding Plan (NPFP) – The NPFP outlines a criteria-based process to prioritize Clean Water Fund investments. Planning partners intending to pursue Clean Water Fund dollars are strongly encouraged to consider the high-level state priorities, keys to implementation, and criteria for evaluating proposed activities in the NPFP.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Conservation Easements – The State's Re-Invest in Minnesota (RIM) Reserve easement program and the Conservation Reserve Enhancement Program (CREP), in partnership with the United States Department of Agriculture (USDA), considers several site specific and landscape scale factors when funding applications. Though it is dependent on specific program terms, the State considers local prioritization of areas for easement enrollment. The plan should take into account areas with a higher risk of contributing to surface and subsurface water degradation, such as highly erosive lands and wellhead protection areas that would benefit from being placed under permanent vegetative cover. Another factor to consider is that in the next 3 years (2019-2021) nearly 6,000 acres of Conservation Reserve Program (CRP) practices are scheduled to expire within the partnership's counties. The plan should recognize the potential impact these expiring contracts may have in the planning area and consider prioritizing working with producers regarding the management of those acres.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	GRAPS - The Groundwater Restoration and Protection Strategies (GRAPS) for the Shell Rock and Winnebago River watersheds is currently under development by the MDH and will be available in the near future. This report will help identify specific groundwater issues in the planning area and ideas for implementation actions to address these issues. These ideas should be vetted by the planning group and a set of them should be incorporated in the plan.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	WRAPS - The Watershed Restoration and Protection Strategies (WRAPS) for the Shell Rock River and Winnebago River Watersheds are currently in development by the MPCA. In the meantime, reports related to the development of the WRAPS should be reviewed and incorporated into your planning effort. These reports (the Monitoring and Assessment report and the Stressor Identification report) can be found here: Shell Rock and Winnebago.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	The Shell Rock and Winnebago River watersheds, and the larger BSA 8, currently have a low supply of wetland bank credits. This is true both for the general public and the Local Government Road Wetland Replacement Program (LGRWRP). The low balance of credits could result in replacement for wetland impacts being exported out of the watershed which further reduces the ability of the landscape, and wetlands in particular, to perform functions at even a basic level. Through the CPF development process BWSR intends to identify priority areas where future wetland restorations would have the highest potential for success and also the greatest potential benefit to the watershed. This process could work closely with the 1W1P process to take advantage of these comprehensive planning efforts and identify wetland restoration priority areas that address multiple watershed management objectives.	Yes		Strategy
Kickoff	Need to decide first what the goals are			Strategy
Kickoff	Need to have an overall plan for a larger area, not just piecemeal fixes			Strategy
Kickoff	Keep the momentom going don't slide back			Strategy
Kickoff	Don't let negativity stop progress			Strategy
Kickoff	Planning, education and financing proceed action at all levels in our community			Strategy

Administrative Priorities 1 of 1

Collaboration

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/20	Nitrogen Fertilizer Management Plan (NFMP) The NFMP is the state's blueprint for preventing or minimizing the impacts of nitrogen fertilizer on groundwater. The primary goal of the NFMP is to involve local farmers and agronomists in problem-solving to address elevated levels of nitrate in groundwater.			Value
BWSR response to notification Shell Rock Winnebago.docx	Urban Stormwater/MS4s – Urban stormwater runoff frequently contains pollutants such as pesticides, fertilizers, sediment, salt, and other debris, which can contribute to excess algae growth and poor water clarity/quality in our water resources. Poorly managed urban stormwater can also drastically alter the natural flow and infiltration of water, scour stream banks and harm or eliminate aquatic organisms and ecosystems. A Municipal Separate Storm Sewer System (MS4) General Permits is owned/operated by the city of Albert Lea within the planning area. This MS4s has accepted an invitation to be on the Policy Committee in the planning effort which should ensure that their Stormwater Pollution Prevention Programs are incorporated into the plan.	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Data for informed decisions is limited	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Establish clear regulatory and cooperative relationships between the City of Albert Lea, the SRRWD, and other regulatory entities	Yes	Albert Lea Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Coordinating county, watershed district, and city regulations	Yes		Strategy
Survey	Smaller water management projects with landowners. I think small water holding areas, restoring small wetlands that a farmer has tried to drain but will not produce could be a great place for a partnership with some wetland restoration and runoff control.			Strategy
Kickoff	Continued partnerships and collaboration from organization agencies			Strategy
Kickoff	Iowa relationship water trail continuation			Strategy
Kickoff	Partner with Iowa on projects			Strategy
Kickoff	Keep the Winnebago watershed involved			Strategy
Kickoff	Working together instead of blaming			Strategy

Collaboration 1 of 1

Financing

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Agricultural Growth, Research, and Innovation (AGRI) Program The AGRI program has funding that may be helpful in water quality protection.			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Agricultural Land Preservation Program The MDA assists local government in protection of farmland through its Agricultural Land Preservation Program. This includes online tools and programmatic support.			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	The AgBMP Loan Program The AgBMP Loan Program is a water quality program that provides low interest loans to farmers, rural landowners, and agriculture supply businesses. The purpose is to encourage agricultural best management practices that prevent or reduce runoff from feedlots, farm fields, and other pollution problems identified by the county in local water plans. In addition, these loans are available to help finance repairs, replacement wells, or water treatment equipment to provide safe drinking water to rural residents who have water quality issues.			Concern
Kickoff	Financial roadblocks to fix erosion problems			Concern
Kickoff	Money			Concern
Kickoff	Money to help sustain our nature			Concern
Kickoff	Who will pay for all of the water quality rules			Concern
Kickoff	Having the financial resources to continue to address water quality and quantity			Concern
Kickoff	Demands placed on nature by economic and residential interests			Concern
Kickoff	Funding			Concern
Shell Rock River Watershed Water Management Plan	Annually submit grant applications to the State for restoration and protection projects.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Find a way to engage more local capacity and funding sources	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Engage the public through BMP cost-share projects.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	The Nonpoint Priority Funding Plan (NPFP) – The NPFP outlines a criteria-based process to prioritize Clean Water Fund investments. Planning partners intending to pursue Clean Water Fund dollars are strongly encouraged to consider the high-level state priorities, keys to implementation, and criteria for evaluating proposed activities in the NPFP.	Yes		Strategy
Kickoff	Farmers need to be paid for setback from streams			Strategy
Kickoff	Need to figure out fair ways to pay for the improvements			Strategy
Kickoff	Provide funding to the custodians of our land aka farmers			Strategy
Kickoff	Additional funding for conservation practices			Strategy
Kickoff	Funding to replace failed septic systems and straight pipes			Strategy
Kickoff	Funding $ dollars $			Strategy
Kickoff	Write grant applications for priority projects			Strategy
Kickoff	We need to continue with current plan - look for funding and enforce			Strategy

Maintenance

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	Well maintained parks and trails			Value
Shell Rock River Watershed Water Management Plan	The State classifies Goose Creek as a Limited Resource Value water (Class 7). Monitoring indicates that Goose Creek is meeting some of its Class 7 water quality standards, though not enough monitoring information is available to confirm this assessment. What water monitoring data that is available points to nitrogen and phosphorus concentrations above ecoregion standards and an issue with fluctuating DO concentrations. Additional monitoring is needed to confirm these assessments.		Goose Creek	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Stormwater system maintenance	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Data Collection and Monitoring – A thorough review of existing data and monitoring is required as a component of the plan. Identification of data or monitoring needs can then be incorporated into implementation activities in order to help measure progress toward plan goals.	Yes		Strategy
Kickoff	A strong watershed that monitors and continually improves water and shoreline quality			Strategy

Policy and Regulation [or Land Use Management]

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Health Initial Comment Letter - 6/24/2019	Focus on providing technical assistance to assess and remediate land use controlled contaminants			Concern
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	The MAWQCP is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect water quality. Participants that implement and maintain approved farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This is a planning program that should be included in the 1W1P because it is an opportunity for agricultural producers to evaluate nutrient and field management practices within the watershed to help reduce losses.			Value
Minnesota Department of Agriculture Initial Comment Letter - 6/20/20	Proposed Groundwater Protection Rule The proposed Groundwater Protection Rule was developed by the MDA with significant stakeholder engagement over the past several years. Scheduled to go into effect in 2020; one of the impacts in the Shell Rock River and Winnebago Watershed will be the prohibition of fall and frozen soil application of nitrogen fertilizer in vulnerable groundwater areas and DWSMAs with wells with high nitrate. The			Value
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Modified Use Thresholds, Lower Water Quality Expectations			Value
Kickoff	I care about the way the land is treated through different land management practices			Value
Kickoff	Regulating the use of pesticides, not only for farmers but city land owners, too, on their lawns			Value
Kickoff	Legacy for next generation			Value
Kickoff	City parks for green spaces			Value
Kickoff	Preservation of parks			Value
Kickoff	Biodiversity of natural habitats and agricultural incorporation			Value
Kickoff	Adequate public lands and access			Value
Kickoff	That farmers are allowed to continue a generational lifestyle of farming without being regulated out of business			Concern
Kickoff	In regards to our community (FC) natural environment I care about: 1. having clean/pure/safe water to drink on a continous basis, 2. Our parks, state park to visit, see wild animals, birds and native plants, 3. Our local parks where kids can play, 4. clean, pure air, 5. clean lakes in our community where we as citizens do NOT DUMP waste, plastic, paper etc in water or on land, cigarettes			Concern
Kickoff	Changing environmental practices federally			Concern
Kickoff	People don't care. Litter, illegally hunt, chop down trees.			Concern
Kickoff	Overbearing regulations in both conservation projects and pollution control			Concern
Kickoff	Waste disposal issue and what can be recycled and what we should stop using like plastic straws, bottles			Value
Kickoff	The over regulation of businesses/ agriculture			Concern
Kickoff	Lake shore homeowner responsibility for grass fertilizer, erosion, garbage			Value
Kickoff	Tighten legislation for clean water			Concern
Shell Rock River Watershed Monitoring and Assessment Report	16 Reaches or AUIDs > 50 Percent Channelized So Not Assessed			Strategy
Shell Rock River Watershed Water Management Plan	Achieve a net reduction in pollutant generation from urban areas by revising and applying the District Rules.	Yes		Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Establish clear regulatory and cooperative relationships between the City of Albert Lea, the SRRWD, and other regulatory entities	Yes	Albert Lea Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Coordinating county, watershed district, and city regulations	Yes		Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Enhance the administration of the local shoreland zoning ordinance so controls are implemented and the adjacent surface water resource is restored, enhanced, or protected from development pressures	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Local Controls - Gaps or inconsistencies in local ordinances, policies, or enforcement could affect the success of your plan's implementation. Redetermination of benefits on drainage systems, SSTS compliance inspection requirements (property transfer, variance, etc.), level 3 feedlot inventories, and shoreland regulations are some examples that should be explored during plan development.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Soil Health – The majority of the land use in the Shell Rock and Winnebago River planning area is agriculture. The concept and the associated practices of soil health have the potential to positively change the interaction of agriculture and the natural system at the soil level. Common soil health practices include the use of reduce or no tillage, the use of cover crops, increased areas of continuous living cover, and extended crop rotations. Improving soil health can help decreased soil erosion, increase water infiltration, provide nutrient scavenging, and increase soil organic matter. In addition, there seems to be increased interest from landowners and operators about soil health. It is recommended that these soil health practices be prioritized for implementation in the plan.	Yes		Strategy
Survey	Clean water -- testing to ID septic system compliance & sources of contamination - controlling erosion, Soil erosion -- enforce buffer strips -- plant cover crops - improve soil health to reduce need for fertilizing -- maintain wetland areas. Wildlife habitat - continue programs to be an incentive to take "marginal" land out of crop production to increase habitat and reduce erosion.			Strategy
Kickoff	Possible to put grass areas around low spots in fields, these could be mapped and farmers paid for set aside			Strategy
Kickoff	Shoreline bobbers (to keep boats away)			Strategy
Kickoff	No mosquito control			Strategy
Kickoff	No nionics			Strategy

Policy and Regulation for Land Use Management 1 of 2

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	More bee hives			Strategy
Kickoff	Retire marginal ag land through conservation easements			Strategy
Kickoff	Better thought out legislation than Dayton's buffer strip land grab			Strategy

Policy and Regulation for Land Use Management

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Public Outreach

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Minnesota Agricultural BMP Handbook (revised in 2018) The MDA recently supported an update to this handbook initially created in 2012. This handbook provides a comprehensive summary of BMPs that are practical for Minnesota. The handbook incorporates the most current data to create realistic estimates of the benefits of best management practice implementation. Estimates of effectiveness, economic consideration and other potential barriers are included with each BMP description in this handbook. This resource may be an especially useful reference for outreach and implementation planning efforts in the agricultural portions of the watershed.			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Public education and participation	Yes		Concern
Kickoff	Next generation? Are they up for the challenge of maintaining nature?			Concern
Kickoff	Uneducated citizens or lack of understanding			Concern
Kickoff	Lack of education about the natural resources			Concern
Kickoff	Salt pollution (storm drainage issue) - educate public on how salt used in winter does not dissolve and accumlates, alternatives			Value
Kickoff	Educate kids by summer "water" camp			Concern
Kickoff	Do regular newspaper columns			Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	The Shell Rock and Winnebago watersheds are home to a variety of native species and invasive species, both terrestrial and aquatic. Fortunately, invasive species are not prevalent in the watersheds, but educating the public about prevention strategies and threats should be a key strategy.	Yes		Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Shallow Lakes Outreach - common belief supports deep, clear water despite the negative consequences tied to striving for these attributes. Take advantage of opportunities to explain and interpret the natural attributes and associated values and ecological services provided by shallow lakes.	Yes		Strategy
Survey	increasing soil health, management and conservation on private lands, conservation practices and cost share to install them.Conservation needs to happen upstream, we can't just treat the results at the lake.To believe that we have completely solved the upland erosion and that Fountain Lake will not fill in again with sediment is unrealistic.Increased perennial vegetation, wetland restorations, and water storage are needed.This area relies on natural resources (farming) as the backbone of the economy.Education of the public, willingness of the public to learn, and motivation of the public to act.		Fountain Lake	Strategy
Kickoff	Communication with community			Strategy
Kickoff	Make decisions public so people understand and feel ownership of the problem			Strategy
Kickoff	Educating the public on a regular basis			Strategy
Kickoff	Education in the schools for future generation			Strategy
Kickoff	We are headed in the right direction. The challenge is to get more people involved and educated.			Strategy
Kickoff	Invite children and students to participate in projects for the environment			Strategy
Kickoff	Educate/communicate with people in watershed. Include their ideas and options.			Strategy
Kickoff	Continued education and programs for farmers, lakeshore owners, students/schools			Strategy
Kickoff	Educate people about what's happening			Strategy
Kickoff	Raise awareness			Strategy
Kickoff	Education			Strategy
Kickoff	Keep people aware of the issues that we face to keep our natural resources			Strategy

Stakeholder Involvement

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Public awareness about water resources in the watershed and appropriate stewardship is limited	Yes		Concern
Kickoff	All residents of watershed work together to contribute to clean water			Value
Kickoff	Unwillingness to change habits that pollute. "culture"			Concern
Shell Rock River Watershed Water Management Plan	Find a way to engage more local capacity and funding sources	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Engage the public through BMP cost-share projects.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Education and public outreach	Yes		Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Citizen Engagement Outreach - many active groups in the watersheds work to promote a high standard of living in Albert Lea. Water resources play a large part of this high standard of living. Our vision embraces sustained resource use based on wise use, protection, and restoration.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Drainage - The drainage authorities within the planning area should be included as stakeholders in the plan development process. This inclusion should ensure that the Chapter 103E processes and proceedings as well as the extent and the limitations of drainage authority responsibility are adequately included in the final plan. Additionally, the planning partners are strongly encouraged to include projects and activities consistent with multipurpose drainage criteria outlined in Minnesota Statutes §103E.011, Subd. 1a and §103E.015, Subd. 1. Refer to the attached document "Chapter 103E Drainage System Consideration for 1W1P" for additional information on 103E Drainage Authority responsibility, authority and opportunity for participating in the planning of conservation practices involving public drainage systems.	Yes		Strategy
Kickoff	Educate/communicate with people in watershed. Include their ideas and options.			Strategy
Kickoff	To have communication at the grass roots level to listen to what the local people want done			Strategy
Kickoff	Strategy - We have to be inclusive, the more people who participate the better the results			Strategy
Kickoff	Continue to support ongoing efforts and activity related to water quality			Strategy
Kickoff	Start groups that will make sure we continue to monitor and help nature			Strategy

Stakeholder Involvement 1 of 1

Fish Habitat

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Further study and address habitat issues in streams. Degrated and/or insufficient stream habitat is a prevalent stressor of biota (i.e., "fish and bugs") in souhbern Minnesota and in the SRRW and Winnegabo. The 1W1P shuld ocnsider the best starategies for addressing habitat issues in the various stettings and at various scales.			Concern
Shell Rock River Watershed Monitoring and Assessment Report	No Assessed Streams Fully Support Aquatic Life			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Fair to Poor Poor Macroinvert Biological Quality in Channelized Streams			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Good to Fair Biological Quality in Channelized Streams			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Fish Barrier on Mud Lake		Mud Lake	Concern
Shell Rock River Watershed Monitoring and Assessment Report	Fair to Poor Habitat Quality			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Fair to Poor Biological Integrity			Concern
Shell Rock River Watershed Monitoring and Assessment Report	High Bedload			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Incised Channels			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	Loss of Habitat Due to Excess Deposited and Bedded Sediment			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Suspended Sediments			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Algae			Concern
Winnebago River Watershed Stressor Identification Report	High Suspended Sediments			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Perched Culverts			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Failing Fish and Invertebrate Scores			Concern
Watershed Report Card: Shell Rock River	Low Biology Health Score of 34			Concern
Watershed Report Card: Winnebago River	Low Biology Health Score of 44			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	High Suspended Sediments			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Poor Habitat for Aquatic Plants			Concern
Shell Rock River Watershed Water Management Plan	Macrophyte and algae overproduction due to excess nutrients creates low and fluctuating dissolved oxygen conditions in streams and lakes	Yes		Concern
Survey	Clean water, less runoff and long term damage and more native plantings. Also, the improvement in fish species in our area have been awesome for the area.			Value
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Kickoff	Fish environment			Value
Kickoff	Fish environment			Value

Fish Habitat 1 of 1

Invasive Species

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	The Shell Rock and Winnebago watersheds are home to a variety of native species and invasive species, both terrestrial and aquatic. Fortunately, invasive species are not prevalent in the watersheds, but educating the public about prevention strategies and threats should be a key strategy.	Yes		Concern
BWSR response to notification Shell Rock Winnebago.docx	Protecting Pollinator Populations - Projects should identify opportunities to benefit pollinator populations through creating areas of refuge and providing floral resources that can benefit a wide range of pollinators. Governor Walz recently signed a new Executive Order "Restoring Healthy, Diverse Pollinator Populations that Sustain and	Yes		Concern
Shell Rock River Watershed Water Management Plan	Carp contribute to internal loading		Albert Lea Lake	Concern
Shell Rock River Watershed Water Management Plan	Carp and other rough fish stir up lake sediments, increasing internal loading, and discharge of nutrients downstream.	Yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #8 - Support Aquatic Invasive Species (AIS) prevention programs	Yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #7- Protect and preserve exisiting shorelands (aquatic invasive species)	Yes		Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Invasive Wetlands Plants (Narrow-Leaf Cattail, Hybrid Cattail, Reed Canary Grass)			Concern
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of			Value
Survey	carp etc.			Concern
Survey	Runoff, farm chemicals, carp and additional drainage.			Concern
Kickoff	Fish community is not what it could be because carp have over-populated			Concern
Kickoff	Invasive species (carp and buckthorn)			Concern
Shell Rock River Watershed Water Management Plan	Remove carp from lakes and restrict their movement	Yes		Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Rough fish control in area lakes		Albert Lea Lake, White	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Fountain Lake Dam and lake level control		Fountain Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Albert Lea Lake Dam repair and replacement		Albert Lea Lake	Strategy

Invasive Species

1 of 1

Manage, Enhance, and Restore Habitat

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Shallow Lakes Outreach - common belief supports deep, clear water despite the negative consequences tied to striving for these attributes. Take advantage of opportunities to explain and interpret the natural attributes and associated values and ecological services provided by shallow lakes.	Yes		Value
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Few native landscapes remain in the Shell Rock and Winnebago watersheds. Most of these native remnants are located on public lands, and therefore are managed by public entities, but some are located on private parcels. These native landscapes need protection and restoration work to maintain the public values and functions.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Land use modification		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	Hydrologic alteration		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	In 2014, School Section Lake was unable to attain the state standard for phosphorus concentrations, similar to the lake's 2013 performance. However, an improvement was observed with School Section Lake recording its best season since 2005. Though both phosphorous concentration and water clarity improved upon the long-term average, the resulting algal blooms prevented the lake from achieving standard-level clarity and School Section Lake remains hypereutrophic.		School Section Lake	Concern
Shell Rock River Watershed Water Management Plan	Increased sediment transport and decay of organic matter creates turbidity which creates conditions inhospitable for aquatic life.	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Sedimentation in Albert Lea Lake		Albert Lea Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Sedimentation in Fountain Lake		Fountain Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Erosion from drainage ditches and creeks			Concern
Shell Rock River Watershed Water Management Plan	The State classifies Goose Creek as a Limited Resource Value water (Class 7). Monitoring indicates that Goose Creek is meeting some of its Class 7 water quality standards, though not enough monitoring information is available to confirm this assessment. What water monitoring data that is available points to nitrogen and phosphorus concentrations above ecoregion standards and an issue with fluctuating DO concentrations. Additional monitoring is needed to confirm these assessments.		Goose Creek	Value
Survey	clean water -- soil erosion- soil health - wildlife habitat			Value
Survey	Clean water, less runoff and long term damage and more native plantings. Also, the improvement in fish species in our area have been awesome for the area.			Value
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Survey	our lakes! pollinator gardens and buffer strips			Value
Survey	safe environment for people and wildlife, recreational opportunities, sustainability, sustainable use of resources meaning that future generations can use the natural resources.			Value
Kickoff	Remaining habitat (trees, plants, animals)			Value
Kickoff	Planting more trees			Value
Kickoff	Native plantings in parks and private property			Value
Kickoff	Eco Friendly environments for birds, pollinators, and all creatures			Value
Kickoff	Sufficient wildlife habitat			Value
Kickoff	Habitats - establish habitats for healthy populations of all animals including fish			Value
Kickoff	Biodiversity of natural habitats and agricultural incorporation			Value
Kickoff	I care about the wildlife and maintaining natural vegetation etc around the lakes			Value
Kickoff	I would like to see more wildlife			Value
Kickoff	Increase pollinator habitat			Value
Kickoff	Open space for wildlife to thrive			Value

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	Shoreline naturalization and preservation			Value
Kickoff	Using plants to help clean water			Value
Kickoff	Declining habitat animals or plants "native"			Concern
Kickoff	A major concern is taking our natural resources for granted			Concern
Kickoff	Having a natural environment that is an escape (quiet, pristine, lots of nature)			Value
Kickoff	I care about the tranquility that nature brings to our area			Value
Kickoff	I care about the beauty of nature. Making sure buildings don't take over. Protect nature.			Value
Kickoff	Shorelines should have more natural vegetation, not grass			Value
Kickoff	Having a natural environment that is self-sustainable (doesn't require a lot of management or manipulation to be healthy)			Value
Kickoff	Diversity of wildlife and healthy wildlife community			Value
Kickoff	Preserve pelican habitat - less motorized boating			Value
Kickoff	Lack of habitat			Concern
Shell Rock River Watershed Water Management Plan	Conserve and restore upland and wetland to provide natural buffering to upstream pollutants.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Restore desirable fish, waterfowl, and wildlife habitat.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Enhance native vegetation to increase fish habitat areas and waterfowl nesting areas.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Annually submit grant applications to the State for restoration and protection projects.	Yes		Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Protect and enhance fish and wildlife habitat and water recreational facilities.	Yes	Albert Lea Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Albert Lea Lake Dam repair and replacement		Albert Lea Lake	Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Restoration work in the contributing watershed must continue to reduce loading. Habitat improvements to minimize the in-lake phosphorus cycling should be considered.	Yes	Fountain Lake	Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Upper and Lower Twin Lakes are noted to have a high biological significance and will be improved after a planned pump station will allow managers more flexibility in achieving management on Upper & Lower Twin Lake uniquely.	Yes	Upper and Lower Twin Lake	Strategy
BWSR response to notification Shell Rock Winnebago.docx	Protecting Pollinator Populations - Projects should identify opportunities to benefit pollinator populations through creating areas of refuge and providing floral resources that can benefit a wide range of pollinators. Governor Walz recently signed a new Executive Order "Restoring Healthy, Diverse Pollinator Populations that Sustain and Enhance Minnesota's Environment, Economy, and Way of Life" that directs efforts of the Interagency Pollinator Protection Team. This team recently released a Minnesota State Agency Pollinator Report that outlines state agency priorities. There is also a BWSR Pollinator Toolbox that provides guidance for project planning, implementation and management. Invasive Species and Landscape Management: A cooperative approach across the watershed is recommended for invasive species management to address invasive species and weed issues across geographic and ownership boundaries. Invasive species should be prioritized based on their risk to ecosystems, agriculture, recreation, and human health. There should also be a focus on emerging weed threats such as Palmer amaranth that pose a significant risk to agricultural production. Adaptive management strategies should be used to address invasive species and also maintain ecological functions and services within landscapes.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Wetlands – Protection and restoration of wetlands provides benefits for water quality, flood damage reduction, and wildlife habitat. The plan should support the continued implementation of the Wetland Conservation Act and look for opportunities to improve coordination across jurisdictional boundaries. The plan should also identify high priority areas for wetland restoration and strategically target restoration projects to those areas. The Restorable Wetland Prioritization Tool is an example resource that can be used to help identify such areas. The state is embarking on a new wetland prioritization plan that will guide wetland mitigation in the future. Wetland restoration and preservation priorities in this plan may be eligible for inclusion in this plan in the future. Please refer to the attached document "Shell Rock River and Winnebago 1W1P Wetland Section Comments" for further information on this program and additional considerations regarding wetlands.	Yes		Strategy

Manage, Enhance, Restore Habitat

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Survey	Let's plant more pollinator friendly plants that also filter out water as it drains into larger bodies of water and waterways.			Strategy
Survey	increasing soil health, management and conservation on private lands, conservation practices and cost share to install		Fountain Lake	Strategy
Kickoff	More natural areas (prairies)			Strategy
Kickoff	More prairies			Strategy
Kickoff	Shoreline restoration from grass			Strategy
Kickoff	More bee hives			Strategy

Preserve Sites of High Ecological Value

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Water Management Plan	Upper and Lower Twin Lakes clarity fluctuate		Upper and Lower Twin Lake	Value
Albert Lea Lake Watershed Management Plan DRAFT	Sensitive resources/habitat are threatened or impaired	Yes		Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	There are high priority lakes in the Shell Rock and Winnebago River watersheds that support significant fisheries. These lakes offer recreational resources, abundant native aquatic plant communities with high species diversity and improved water quality.	Yes	na	Value
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Watershed produces high flows and bounce water levels, aggravating the shoreline. This lake benefits from the existing significant undeveloped shoreline. Bear Lake has outstanding biological significance.	Yes	Bear Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	The lake is impacted by drainage but helps normalize those flows as they leave the lake. A DNR WMA encompasses most of the lakeshore and includes a 10-acre designated old growth hardwood forest.	Yes	Halls Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Upper and Lower Twin Lakes are noted to have a high biological significance and will be improved after a planned pump station will allow managers more flexibility in achieving management on Upper & Lower Twin Lake uniquely.	Yes	Upper and Lower Twin Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Few native landscapes remain in the Shell Rock and Winnebago watersheds. Most of these native remnants are located on public lands, and therefore are managed by public entities, but some are located on private parcels. These native landscapes need protection and restoration work to maintain the public values and functions.	Yes		Value
Kickoff	Expanding urban development and development of lakeshore and riparian/natural areas			Concern
Kickoff	Loss of trees and green spaces			Concern
Shell Rock River Watershed Water Management Plan	Restore desirable fish, waterfowl, and wildlife habitat.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Enhance native vegetation to increase fish habitat areas and waterfowl nesting areas.	Yes		Strategy

Preserve Sites of High Ecological Value

1 of 1

Protect Soil Health

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Erosion control and topsoil preservation	Yes		Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Steep Slopes on Agricultural Land			Concern
Survey	clean water -- soil erosion- soil health - wildlife habitat			Value
Survey	Increasing scale of agriculture including non-natural inputs that degrade soil health, lack of understanding of causes, increased urban and impervious surfaces without equal consideration to water quality.			Concern
Kickoff	I would like to see less soil erosion			Value
Kickoff	Healthy soil that retains water, solids, nutrients and maintains ecosystem			Value
Kickoff	Poor tillage practice			Concern
Kickoff	Soil erosion on crop land			Concern
Kickoff	Excessive soil erosion and nutrients making it to streams			Concern
Kickoff	The shoreline we live on is wasting away from the very fast loud and close boats. We had milk gallons out 25 years ago. We need a way to keep boats far from the shore.			Value
Kickoff	Healthy soils that regulate water movement			Value
Kickoff	Shoreline			Concern
BWSR response to notification Shell Rock Winnebago.docx	Soil Health – The majority of the land use in the Shell Rock and Winnebago River planning area is agriculture. The concept and the associated practices of soil health have the potential to positively change the interaction of agriculture and the natural system at the soil level. Common soil health practices include the use of reduce or no tillage, the use of cover crops, increased areas of continuous living cover, and extended crop rotations. Improving soil health can help decreased soil erosion, increase water infiltration, provide nutrient scavenging, and increase soil organic matter. In addition, there seems to be increased interest from landowners and operators about soil health. It is recommended that these soil health practices be prioritized for implementation in the plan.	Yes		Strategy
Survey	Clean water -- testing to ID septic system compliance & sources of contamination - controlling erosion, Soil erosion -- enforce buffer strips -- plant cover crops - improve soil health to reduce need for fertilizing -- maintain wetland areas. Wildlife habitat - continue programs to be an incentive to take "marginal" land out of crop production to increase habitat and reduce erosion.			Strategy
Survey	increasing soil health, management and conservation on private lands, conservation practices and cost share to install them.Conservation needs to happen upstream, we can't just treat the results at the lake.To believe that we have completely solved the upland erosion and that Fountain Lake will not fill in again with sediment is unrealistic.Increased perennial vegetation, wetland restorations, and water storage are needed.This area relies on natural resources (farming) as the backbone of the economy.Education of the public, willingness of the public to learn, and motivation of the public to act.		Fountain Lake	Strategy

Protect Soil Health

1 of 1

Upland Habitat

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	Plowing of Native Prairies			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Heavily Utilized for Ag Production (78 Percent of Landscape)			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Land Use Modification			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Low Perennial Cover Score			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Low Terrestrial Habitat Score			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Low Non-Point Source Phosphorus Risk Score			Concern
Watershed Context Report: Shell Rock River	Some Areas of High and Moderate Biodiversity Significance			Concern
Watershed Context Report: Shell Rock River	MS4 Loads Contributing, In watershed, 94.79 People Per Sq Mi, 2.44 Percent Impervious			Concern
Watershed Context Report: Winnebago River	Some Areas of Moderate Biodiversity Significance			Value
Watershed Context Report: Winnebago River	Hydric vs Wetland Percent Indicates High Amount of Drained Wetlands			Concern
Watershed Report Card: Shell Rock River	Low Average Watershed Health Score of 43			Concern
Watershed Report Card: Winnebago River	Low Average Watershed Health Score of 49			Concern
Kickoff	Treat upland (farmland) through usage of cover crops and reduced tillage like strip-till and no-till			Strategy

Wetland Habitat

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #2- Preserve exisiting & create wetlands	Yes		Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Poor Wetland Condition			Concern
Watershed Context Report: Shell Rock River	Hydric vs Wetland Percent Indicates High Amount of Drained Wetlands			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Invasive Wetlands Plants (Narrow-Leaf Cattail, Hybrid Cattail, Reed Canary Grass)			Concern
BWSR response to notification Shell Rock Winnebago.docx	Wetlands – Protection and restoration of wetlands provides benefits for water quality, flood damage reduction, and wildlife habitat. The plan should support the continued implementation of the Wetland Conservation Act and look for opportunities to improve coordination across jurisdictional boundaries. The plan should also identify high priority areas for wetland restoration and strategically target restoration projects to those areas. The Restorable Wetland Prioritization Tool is an example resource that can be used to help identify such areas. The state is embarking on a new wetland prioritization plan that will guide wetland mitigation in the future. Wetland restoration and preservation priorities in this plan may be eligible for inclusion in this plan in the future. Please refer to the attached document "Shell Rock River and Winnebago 1W1P Wetland Section Comments" for further information on this program and additional considerations regarding wetlands.	Yes		Concern
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Kickoff	Loss of wetlands			Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Shell Rock River - imparied for aquatic life due to turbidity, pH, nutrients and DO. BMPs in the upper watershed along with filter strips and riparian protection will help. DNR is committed to assisting with stream restoration projects.	Yes	Shell Rock River	Strategy
BWSR response to notification Shell Rock Winnebago.docx	If wetland restoration projects become part of a local implementation plan they should be focused on restoring, to the greatest extent practicable, pre-disturbance conditions with respect to hydrology and vegetation. Restoration projects that are focused on a single function or service should be less of a priority than those that focus on the suite of functions provided by these resources. Also, restoration efforts should attempt to restore self-sustaining systems that are not reliant on structures and/or routine management and operation.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	The Shell Rock and Winnebago River watersheds, and the larger BSA 8, currently have a low supply of wetland bank credits. This is true both for the general public and the Local Government Road Wetland Replacement Program (LGRWRP). The low balance of credits could result in replacement for wetland impacts being exported out of the watershed which further reduces the ability of the landscape, and wetlands in particular, to perform functions at even a basic level. Through the CPF development process BWSR intends to identify priority areas where future wetland restorations would have the highest potential for success and also the greatest potential benefit to the watershed. This process could work closely with the 1W1P process to take advantage of these comprehensive planning efforts and identify wetland restoration priority areas that address multiple watershed management objectives.	Yes		Strategy
Survey	Clean water -- testing to ID septic system compliance & sources of contamination - controlling erosion, Soil erosion -- enforce buffer strips -- plant cover crops - improve soil health to reduce need for fertilizing -- maintain wetland areas. Wildlife habitat - continue programs to be an incentive to take "marginal" land out of crop production to increase habitat and reduce erosion.			Strategy
Survey	increasing soil health, management and conservation on private lands, conservation practices and cost share to install them.Conservation needs to happen upstream, we can't just treat the results at the lake.To believe that we have completely solved the upland erosion and that Fountain Lake will not fill in again with sediment is unrealistic.Increased perennial vegetation, wetland restorations, and water storage are needed.This area relies on natural resources (farming) as the backbone of the economy.Education of the public, willingness of the public to learn, and motivation of the public to act.		Fountain Lake	Strategy

Wetland Habitat

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Aquatic Consumption

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	3 Lakes Not Supporting Aquatic Consumption			Concern
Shell Rock River Watershed Water Management Plan	North Fountain Lake was listed in 2008 as impaired for aquatic consumption. Fountain Lake's North, East and West Bays are impaired for aquatic consumption due to high levels of mercury in fish tissue. The North Bay was added to the impaired waters list in 2008 while East and West Bays were added to the impaired waters list in 2012. Fountain Lake receives over 50% of its phosphorus load from internal loading so District efforts to reduce internal loading are well targeted.		Fountain Lake	Concern

Aquatic Recreation

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	5 Lakes Not Supporting Aquatic Recreation			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Modest to Poor Lake Water Quality			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Nutrient Eutrophication			Concern
Shell Rock River Watershed Monitoring and Assessment Report	No Assessed Streams Fully Support Aquatic Recreation			Concern
Shell Rock River Watershed Monitoring and Assessment Report	High Bacteria Levels			Concern
Winnebago River Watershed Stressor Identification Report	Bacteria Impairments			Concern
Winnebago River Watershed Stressor Identification Report	Eutrophication Impairments			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Eutrophication Impairmented Lakes			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	High Nutrients			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Failing SSTS			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Feedlot Runoff			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #6 - Provide recreational opportunities on public waters (shoreland)	yes		Value
Shell Rock River Watershed Water Management Plan	Bacteria from ISTS and Feedlots		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	The MPCA has listed Bancroft Creek and Wedge Creek as impaired for aquatic recreation due to high bacteria levels. The District's streams have been heavily channelized and now have a low gradient and fair to poor habitat.		Bancroft Creek Wedge Creek	Concern
Shell Rock River Watershed Water Management Plan	Phosphorus in lakes has two primary sources: external and internal loading. External loading is a result of sediment and pollutants carried off the landscape by stormwater runoff and deposited into the lake by upstream waters. Internal loading is caused by phosphorus rich bottom sediments being released into the water column by a multitude of processes.		Fountain Lake	Concern
Shell Rock River Watershed Water Management Plan	Albert Lea Lake as impaired aquatic recreation due to excess nutrients		Albert Lea Lake	Concern
Shell Rock River Watershed Water Management Plan	Pickeral Lake, upstream of Albert Lea Lake, was also listed due to excess nutrients in 2008		Pickeral Lake	Concern
Shell Rock River Watershed Water Management Plan	White Lake was assessed as impaired for aquatic recreation during the same assessment cycle (2008)		White Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Changing land use		Albert Lea Lake Pickeral Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Public lands are limited in the watershed and access to this properties should be enhanced.Several recreation access projects are underway within the watershed. Focus is needed to complete these ongoing projects while adding public access on resources that lake such an access.	Yes		Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	There are high priority lakes in the Shell Rock and Winnebago River watersheds that support significant fisheries. These lakes offer recreational resources, abundant native aquatic plant communities with high species diversity and improved water quality.	Yes	na	Value

Aquatic Recreation

1 of 2

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Survey	Fishing			Value
Survey	Clean water for our waterfowl and fishing lakes as well as recreation.			Value
Survey	Water quality for both Fountain Lake and Albert Lea Lake as well as other local lakes,rivers/streams.Getting rid of the algae from all bodies of water.Making the lakes clean enough for swimming		Fountain Lake, Albert Lea Lake	Value
Survey	Safe and clean water for recreation			Value
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Survey	safe environment for people and wildlife, recreational opportunities, sustainability, sustainable use of resources meaning that future generations can use the natural resources.			Value
Survey	Water sports and recreation over natural habitat and clean water			Concern
Kickoff	Clean water trails and lakes for recreation			Value
Kickoff	Quiet places to escape to and enjoy the natural world			Value
Kickoff	Clean water for recreating			Value
Kickoff	Cleaner water for recreation			Value
Kickoff	Recreation			Value
Kickoff	Animals and fish - having fish and animals to hunt/catch, recreation			Value
Kickoff	Unwillingness to change habits that pollute. "culture"			Concern
Kickoff	I am interested in keeping as much nature as possible for recreation like hiking, boating and camping			Value
Kickoff	I care about the future of fishing in our lakes. I would like to see it flourish.			Value
Kickoff	Want to swim and fish safely again			Value
Albert Lea Lake Watershed Management Plan DRAFT	Protect and enhance fish and wildlife habitat and water recreational facilities.	Yes	Albert Lea Lake	Strategy
BWSR response to notification Shell Rock Winnebago.docx	Lakes – There are many lakes within the planning area that are valued for their recreational opportunities. All are considered shallow lakes by the Minnesota DNR's definition, and seven are currently listed as impaired for aquatic recreation by the MPCA. Due to their shallow nature and high phosphorus levels, BMPs that reduce phosphorus movement in the watershed and restoration efforts are important to help improve recreational opportunities and address re-suspension of that phosphorus throughout the open water season. Because of its location at the top of the watershed, Albert Lea Lake may be of particular concern.	Yes		Strategy

Public Safety

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Abandoned wells	No		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Land use and hazardous byproducts	No		Concern
Survey	safe environment for people and wildlife, recreational opportunities, sustainability, sustainable use of resources meaning that future generations can use the natural resources.			Value
Survey	Wondering if the water is safe for swimming and fishing			Concern
Kickoff	Water is safe for humans and wildlife			Value
Kickoff	Clean water for healthy living			Value
Kickoff	I care about what is growing in our lakes and the safety to humans and animals and fish			Value
Kickoff	I love fresh air (nonpolluted)			Value
Kickoff	I am afraid of my grandkids swimming in the lake we live on (Fountain) even though they have life preservers on, if they came off accidentally. They might be lost in the cloudy water and drown.		Fountain Lake	Value
Kickoff	Being able to fish and swim in water without getting sick (care about not having blue-green algae blooms)			Value

Public Safety 1 of 1

Altered Hydrology

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	The lake is impacted by drainage but helps normalize those flows as they leave the lake. A DNR WMA encompasses most of the lakeshore and includes a 10-acre designated old growth hardwood forest.	Yes	Halls Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Winnebago River Watershed - The Winnebago River is entirely altered in MN. Water storage projects in the upland and increasing floodplain connectivity could benefit channel stability because flows rarely leave the channel.	Yes	Winnebago River	Concern
BWSR response to notification Shell Rock Winnebago.docx	Altered Hydrology/Flooding/Water Quantity – The hydrologic conditions of the watersheds in this planning area have changed over time. In recent decades more precipitation, more runoff, and more runoff per unit of precipitation has been observed as well as more frequent periods of extremely low flow in some watercourses. These hydrologic changes as well as others have contributed to instability of natural and artificial watercourses, degradation of wetland habitats, loss of agricultural productivity, and increased the risk of flood damages. Recognizing altered hydrology as a priority issue in the plan will help ensure that a driving factor behind many related issues is directly addressed.	Yes		Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Drainage system management: A comprehensive drainage system management effort is needed to address stream hydrology issues for the long-term. This involves drainage networks and systems in both rural and urban areas.			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Draining of Wetlands			Concern
Shell Rock River Watershed Monitoring and Assessment	Modification of Natural Stream Courses			Concern
Shell Rock River Watershed Monitoring and Assessment	Ditched/Straightened Headwater Streams			Concern
Shell Rock River Watershed Monitoring and Assessment	16 Reaches or AUIDs > 50 Percent Channelized So Not Assessed			Concern
Shell Rock River Watershed Monitoring and Assessment	Tile Drainage			Concern
Shell Rock River Watershed Monitoring and Assessment	Transport of Ammonia From Fields Through Tile Drainage			Concern
Shell Rock River Watershed Biotic Stressor Identification	Increasing Runoff			Concern
Winnebago River Watershed Stressor Identification Report	Flow Alteration			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	No Sections of Natural Streams Left			Concern
Winnebago River and Upper Wapsipinicon River	42% of Wetlands are in Poor Condition			Concern
Winnebago River and Upper Wapsipinicon River	Tile Drainage			Concern
Winnebago River and Upper Wapsipinicon River	Perched Culverts			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Ditches Increasing Contributions of Flow and Pollutants to Streams			Concern
Winnebago River and Upper Wapsipinicon River	90.65% of Wetlands Drained/Converted to Non-Wetland			Concern
Watershed Context Report: Shell Rock River	Hydric vs Wetland Percent Indicates High Amount of Drained Wetlands			Concern
Watershed Context Report: Shell Rock River	High Percentage of Altered, Impounded, and No Definable Channel			Concern
Watershed Context Report: Winnebago River	Hydric vs Wetland Percent Indicates High Amount of Drained Wetlands			Concern
Watershed Context Report: Winnebago River	High Percentage of Altered, Impounded, and No Definable Channel			Concern
Watershed Report Card: Shell Rock River	Very Low Connectivity Health Score of 18			Concern
Watershed Report Card: Winnebago River	Very Low Connectivity Health Score of 14			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Steep Slopes on Agricultural Land			Concern
Shell Rock River Watershed Water Management Plan	Loss of upland retention and increases in hydrologic flow.			Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes such as stream channelization, tile drainage, draining of wetlands and loss of retention increases nutrient loads, hydrologic flow and sediment loads.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes due to cropping practices allow more field erosion to move downstream	Yes		Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes lead to more prevalent streambank erosion, increasing downstream sediment transport.	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Drain tile and drainage ditches			Concern
Kickoff	Dams			Concern

Altered Hydrology

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Drainage System Management

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Pollution Control Agency Priority Concerns Letter 6/19/19	Hydrology management. Southern Minnesota is known for its productive soils and resulting intensive agricultural land use. Agricultural drainage (tiling and drainage ditches) is a common occurrence in the Shell Rock 1W1P area.			Concern
Shell Rock River Watershed Water Management Plan	Loss of upland retention and increases in hydrologic flow.			Concern
Shell Rock River Watershed Water Management Plan	Channelization and loss of attenuation characteristics of floodplain.			Concern
Shell Rock River Watershed Water Management Plan	Ditching and tiling create drainage in areas where infiltration used to occur.			Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #1 - Maintain drainage systems while improving agricultural productivity	Yes		Value
Survey	Runoff, farm chemicals, carp and additional drainage.			Concern
Kickoff	Putting debris in sewers			Concern
Kickoff	Ag drainage expansion			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Stormwater system maintenance	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Drainage - The drainage authorities within the planning area should be included as stakeholders in the plan development process. This inclusion should ensure that the Chapter 103E processes and proceedings as well as the extent and the limitations of drainage authority responsibility are adequately included in the final plan. Additionally, the planning partners are strongly encouraged to include projects and activities consistent with multipurpose drainage criteria outlined in Minnesota Statutes §103E.011, Subd. 1a and §103E.015, Subd. 1. Refer to the attached document "Chapter 103E Drainage System Consideration for 1W1P" for additional information on 103E Drainage Authority responsibility, authority and opportunity for participating in the planning of conservation practices involving public drainage systems.	Yes		Strategy
BWSR response to notification Shell Rock Winnebago.docx	Local Controls - Gaps or inconsistencies in local ordinances, policies, or enforcement could affect the success of your plan's implementation. Redetermination of benefits on drainage systems, SSTS compliance inspection requirements (property transfer, variance, etc.), level 3 feedlot inventories, and shoreland regulations are some examples that should be explored during plan development.	Yes		Strategy

Drainage System Management

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Erosion & Sediment Control

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #2 - Control soil erosion	Yes		Value
Shell Rock River Watershed Water Management Plan	The MPCA listed Shoff Creek, which flows from Mud Lake to Fountain Lake, as impaired for aquatic life due to high levels of sediment creating turbidity. Current monitoring still supports this assessment and listing.		Schoff Creek	Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes due to cropping practices allow more field erosion to move downstream	Yes		Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes lead to more prevalent streambank erosion, increasing downstream sediment transport.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Increased sediment transport and decay of organic matter creates turbidity which creates conditions inhospitable for aquatic life.	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Drain tile and drainage ditches			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Soil erosion along Freeborn County roadways			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Erosion from drainage ditches and creeks			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Erosion control and topsoil preservation	Yes		Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Watershed produces high flows and bounce water levels, aggravating the shoreline. This lake benefits from the existing significant undeveloped shoreline. Bear Lake has outstanding biological	Yes	Bear Lake	Concern
Survey	Sedimentation and phosphorus			Concern
Survey	Runoff, farm chemicals, carp and additional drainage.			Concern
Kickoff	Excessive soil erosion and nutrients making it to streams			Concern
Kickoff	Shoreline			Concern
Kickoff	Completing dredging Fountain and Albert Lea lakes		Fountain Lake Albert Lea Lake	Concern
Kickoff	Too much sediment entering lakes			Concern
Kickoff	Soil erosion too high			Concern
Kickoff	Runoff			Concern
Kickoff	Soil runoff, water quality			Concern
Kickoff	We need to do something with the gravel roads. It begins with water. And no plan for repair.			Concern
Survey	clean water -- soil erosion- soil health - wildlife habitat			Value
Survey	Clean water, less runoff and long term damage and more native plantings. Also, the improvement in fish species in our area have been awesome for the area.			Value
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Kickoff	I care about runoff into the lakes (sediment)			Value
Kickoff	Shoreline quality			Value
Kickoff	The shoreline we live on is wasting away from the very fast loud and close boats. We had milk gallons out 25 years ago. We need a way to keep boats far from the shore.			Value
Shell Rock River Watershed Water Management Plan	Stabilize and restore streambanks to decrease downstream loading of sediment.	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Sediment (streambank and field erosion)		Shell Rock River	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Prevent erosion of soil into surface water systems	Yes	Albert Lea Lake	Strategy
Survey	Dredge Fountain and Albert Lea Lakes			Strategy

Erosion Sediment Control

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Survey	More dredging		Fountain Lake Albert Lea Lake	Strategy
Survey	Dredge other lakes, pickerel to sand bottom, allow deeper so fish kills not so often			Strategy
Survey	Ongoing filter strips, carp removal and possible settling ponds before water flows into our lakes			Strategy
Survey	Clean water -- testing to ID septic system compliance & sources of contamination - controlling erosion, Soil erosion -- enforce buffer strips -- plant cover crops - improve soil health to reduce need for fertilizing -- maintain wetland areas. Wildlife habitat - continue programs to be an incentive to take "marginal" land out of crop production to increase habitat and reduce erosion.			Strategy
Survey	Dredging all parts of Fountain Lake.A "catch" basin for storm drain runoff.Eliminate farm and yard runoff into the lakes		Fountain Lake	Strategy
Survey	The channel needs to be dredged and garbage needs to be removed regularly.People have been dumping tires in the channel near the boathouse recently			Strategy
Survey	In Phase 2 of the Fountain Lake dredging project, dredging of all upstream sources should be completed first (Edgewater Bay-done, developed part of Bancroft Bay and Dan's Bay) before dredging the "main" lake portion. Otherwise, the upstream nutrients will keep "refilling" the dredged areas reversing any progress that was gained by the dredge. This approach will help reduce the continual flow of excess nutrients and aquatic weeds that regularly is "fed" from these bays and pushes to the main lake/boat launches causing many challenges. In addition, growing the network of filtration methods of water being fed into the rivers/lakes and expand efforts to work with farmers to eliminate any excess nutrients from fertilizers contributing to the excessive growth challenges are both critical approaches as well.		Fountain Lake	Strategy
Survey	increasing soil health, management and conservation on private lands, conservation practices and cost share to install them.Conservation needs to happen upstream, we can't just treat the results at the lake.To believe that we have completely solved the upland erosion and that Fountain Lake will not fill in again with sediment is unrealistic.Increased perennial vegetation, wetland restorations, and water storage are needed.This area relies on natural resources (farming) as the backbone of the economy.Education of the public, willingness of the public to learn, and motivation of the public to act.		Fountain Lake	Strategy
Kickoff	Control incoming streams (fountain)			Strategy
Kickoff	Control runoff			Strategy
Kickoff	Install grassed waterways and other best management practices to reduce erosion			Strategy

Erosion Sediment Control

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Flooding & Floodplain

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Water Management Plan	Channelization and loss of attenuation characteristics of floodplain.			Concern
Albert Lea Lake Watershed Management Plan DRAFT	The City of Albert Lea's "existing storm sewer system does not provide a 10-year level of service"			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Localized flooding			Concern
Kickoff	Flooding in farm fields and in town			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Address local flooding issues within the City of Albert Lea and surrounding watershed	Yes	Albert Lea Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Repair/address localized areas of inadequate storm sewer capacity	Yes		Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Winnebago River Watershed - The Winnebago River is entirely altered in MN. Water storage projects in the upland and increasing floodplain connectivity could benefit channel stability because flows rarely leave the channel.	Yes	Winnebago River	Strategy
Kickoff	Focus on more larger water storage areas to reduce flooding			Strategy

Protect Surface Water Resources

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	This designated wildlife lake is experiencing prolonged periods of inundation. Water levels have remained high resulting in shoreland erosion and low diversity in the basin. The lake is noted to have a moderate biological significace.	Yes	State Line Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	This 82 acre lake has been partially drained. The remaining basin represents about 1/3 of the historic basin. The basin drains west into Bancroft Bay on Fountain Lake.	Yes	Goose Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Improve and protect the watershed's lakes. Generally, local partners and landowners need to make a long-term commitment to reduce phosphorus and sediment entering lakes in order to improve water quality	Yes	Fountain, White, Bear, Stateline	Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #1 - Address impaired and unimpaired surface waters	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #4 - Partner with other agencies to improve surface waters	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #5 - Improve water quality of lakes	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #1 - Protect surface water and groundwater from SSTS contamination (Feedlots)	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #2 - Protect surface water and groundwater resources from feedlot/animal waste contamination	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #4 - Protect surface water and groundwater from mixed solid waste contamination	Yes		Value
freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #5 - Protect surface water and groundwater from hazardous waste pollution	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #1 - Protect surface water and groundwater from municipal wastewater and stormwater contamination	Yes		Value
Shell Rock River Watershed Water Management Plan	Land use modification		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	Hydrologic alteration		Shell Rock River	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Sensitive resources/habitat are threatened or impaired	Yes		Concern
Survey	Water quality for both Fountain Lake and Albert Lea Lake as well as other local lakes,rivers/streams.Getting rid of the algae from all bodies of water.Making the lakes clean enough for swimming		Fountain Lake, Albert Lea Lake	Value

Protect Surface Water Resources

1 of 2

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Survey	Abundant nutrient oversupply on the lake and river bottoms (i.e. Fountain Lake) is fueling rapid growth of duckweed and other aquatic plants with mediocre water quality visibility.Much of the extra nutrients is in the form of extra material that has accumulated over the years in part from over application of chemicals sprayed by farmers in addition to the lack of preventative measures such as filters at the entry points into the waterways. These extra nutrients and artificially shallow lake bottom is resulting in a reduced health in the ecosystem most noticeable in Bancroft Bay of Fountain lake.Early in the season before the entire bay is covered in duckweed and aquatic leaves, there is significant fish and bird activity. Once the Duckweed growth kicks in, the fish mostly depart this bay and birds (specifically Pelicans) move to Albert Lea Lake in portions that are not covered in duckweed. Beyond the ecosystem concerns this excessive growth has reduced/limited recreation abilities in at least Fountain Lake (that I can speak to).Duckweed flows regularly from Bancroft Bay into the Boathouse channel by the main boat launch.This has caused many (including myself) economic harm and reduce enjoyment of area watershed resources. Specifically after a large rain this year, a massive "bank" of duckweed got pushed down the channel to the boat launch and to the end by the entry to the main lake, which has remained for months. In one instance, every boat in front/back of us had to drive through this thick duckweed, six in total that I observed. The motor on every single boat had troubles accelerating (sputtered/died) on the main lake as the duckweed got into the cooling systems. One of my neighbor's boat motors was completely ruined (had to get replaced) and personally after this I spent hundreds on a new trolling motor so I could "troll" through this junk with an electronic motor and not harm my main boat motor. While many of these plants are native, the extent of the growth we are seeing is not and is causing ecosystem and recreation concerns, prohibiting use of public launches and waterways leading to economic harm to resident and visitor property.		Fountain Lake, Albert Lea Lake	Concern
Kickoff	I care about what's happening upstream from our area			Value
Kickoff	Lack of natural filtration near waterways			Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Protection of the shore and implementing BMPs is important because this lake has a higher sensitivity to nutrient loading	Yes	Albert Lea Lake	Strategy
BWSR response to notification Shell Rock Winnebago.docx	WRAPS - The Watershed Restoration and Protection Strategies (WRAPS) for the Shell Rock River and Winnebago River Watersheds are currently in development by the MPCA. In the meantime, reports related to the development of the WRAPS should be reviewed and incorporated into your planning effort. These reports (the Monitoring and Assessment report and the Stressor Identification report) can be found here: Shell Rock and Winnebago.	Yes		Strategy
Survey	Ongoing filter strips, carp removal and possible settling ponds before water flows into our lakes			Strategy
Kickoff	Shellrock Watershed was formed by glacier as shallow collection bowls. What is put in sometimes steep. Think about what we put in.			Strategy

Protect Surface Water Resources

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Stormwater Management

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	Urban Stormwater Pollutant Contributions			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Lawn Fertilizer Contributions			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Grass/Leaf Clippings Contributing to Stream Nutrients			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Pet Waste Contributions			Concern
Watershed Context Report: Shell Rock River	MS4 Loads Contributing, In watershed, 94.79 People Per Sq Mi, 2.44 Percent Impervious			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	MS4 Sources, Construction Stormwater, and Industrial Sources Conributing Pollutants			Concern
Shell Rock River Watershed Water Management Plan	Urban stormwater		Shell Rock River	Concern
Kickoff	Inadequate storm water drainage			Concern
Kickoff	Storm sewers are a source of pollution especially if they are blocked by snow and ice and anxious residents want to get them cleared fast because of flooding			Value
Kickoff	Salt pollution (storm drainage issue) - educate public on how salt used in winter does not dissolve and accumlates, alternatives			Value
Albert Lea Lake Watershed Management Plan DRAFT	Prevent erosion of soil into surface water systems	Yes	Albert Lea Lake	Strategy
BWSR response to notification Shell Rock Winnebago.docx	Urban Stormwater/MS4s – Urban stormwater runoff frequently contains pollutants such as pesticides, fertilizers, sediment, salt, and other debris, which can contribute to excess algae growth and poor water clarity/quality in our water resources. Poorly managed urban stormwater can also drastically alter the natural flow and infiltration of water, scour stream banks and harm or eliminate aquatic organisms and ecosystems. A Municipal Separate Storm Sewer System (MS4) General Permits is owned/operated by the city of Albert Lea within the planning area. This MS4s has accepted an invitation to be on the Policy Committee in the planning effort which should ensure that their Stormwater Pollution Prevention Programs are incorporated into the plan.	Yes		Strategy

Stormwater Management 1 of 1

Surface Water Quality

RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Protection of the shore and implementing BMPs is important because this lake has a higher sensitivity to nutrient loading	Yes	Albert Lea Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Impaired. Restoration work in the contributing watershed must continue to reduce loading. Habitat improvements to minimize the in-lake phosphorus cycling should be considered.	Yes	Fountain Lake	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Bancroft Creek - Impaired for aquatic recreation due to E. Coli, IBI. Restoration and protection strategies should focus on protecting and restoring the riparian zone.	Yes	Bancroft Creek	Concern
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Shell Rock River - imparied for aquatic life due to turbidity, pH, nutrients and DO. BMPs in the upper watershed along with filter strips and riparian protection will help. DNR is committed to assisting with stream restoration projects.	Yes	Shell Rock River	Concern
BWSR response to notification Shell Rock Winnebago.docx	Lakes – There are many lakes within the planning area that are valued for their recreational opportunities. All are considered shallow lakes by the Minnesota DNR's definition, and seven are currently listed as impaired for aquatic recreation by the MPCA. Due to their shallow nature and high phosphorus levels, BMPs that reduce phosphorus movement in the watershed and restoration efforts are important to help improve recreational opportunities and address re-suspension of that phosphorus throughout the open water season. Because of its location at the top of the watershed, Albert Lea Lake may be of particular concern.	Yes		Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Albert Lea Lake is impaired		Albert Lea Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Bancroft Creek (County Ditch 53) is impaired		Bancroft Creek	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	East Bay Fountain Lake is impaired		Fountain Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	West Bay Fountain Lake is impaired		Fountain Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Pickeral Lake is impaired		Pickeral Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Shell Rock River is impaired		Shell Rock River	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Schoff Creek is impaired		Schoff Creek	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Wedge Creek is impaired		Wedge Creek	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	White Lake is impaired		White Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Bear Lake is impaired		Bear Lake	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Judicial Ditch 25 is impaired		Judicial Ditch 25	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Lime Creek is impaired		Lime Creek	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	State Line Lake is impaired		State Line	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Steward Creek (County Ditch 23) is impaired		Steward Creek	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Unnamed Creek is impaired		07080203-509	Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Nutrient Reduction - Point Source Reduction			Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Nutrient Reduction - NonPoint Source Reduction			Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Work to reduce pathogens in surface waters. The presence of fecal pathogens in surface water is a regional problem in southern Minnesota. Manure runoff, unsewered communities, failing Subsurface Sewage Treatment System (SSTS), and over-grazed pastures (among others) are areas to target for E.			Concern
Minnesota Pollution Control Agency Priority Concerns Letter - 6/19/19	Additional Stressors and Pollutants. Sediment (and associated turbidity), DO, aquatic habitat and flow alteration are prevalent stressors of aquatic life in the SRRW and Winnebago			Concern

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Minnesota Department of Agriculture Initial Comment Letter - 6/20/19	Surface Water Monitoring The MDA has completed six pesticide and/or nutrient water quality sample collection events from six river and stream locations within the Shell Rock River and Winnebago River Watershed from 2010-2011. There are currently no pesticide water quality impairments in the watershed.			Concern
Shell Rock River Watershed Water Management Plan	Sediment (streambank and field erosion)		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	Bacteria from ISTS and Feedlots		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	Excess nutrients (nitrogen and phosphorus)		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	The MPCA has listed Bancroft Creek and Wedge Creek as impaired for aquatic recreation due to high bacteria levels. The District's streams have been heavily channelized and now have a low gradient and fair to poor habitat.		Bancroft Creek Wedge Creek	Concern
Shell Rock River Watershed Water Management Plan	In 2014, School Section Lake was unable to attain the state standard for phosphorus concentrations, similar to the lake's 2013 performance. However, an improvement was observed with School Section Lake recording its best season since 2005. Though both phosphorous concentration and water clarity improved upon the long-term average, the resulting algal blooms prevented the lake from achieving standard-level clarity and School Section Lake remains hypereutrophic.		School Section Lake	Concern
Shell Rock River Watershed Water Management Plan	The increased water clarity in Pickerel Lake resulted in a surge in un-wanted curly-leaf pondweed in the lake. Curly-leaf pondweed is problematic because it can displace native aquatic plants and large mid-summer die offs often add phosphorus content to lakes, which enable algal growth. The District is closely monitoring curly-leaf pondweed to prevent water quality backsliding to prereclamation levels		Pickeral Lake	Concern
Shell Rock River Watershed Water Management Plan	The MPCA listed Shoff Creek, which flows from Mud Lake to Fountain Lake, as impaired for aquatic life due to high levels of sediment creating turbidity. Current monitoring still supports this assessment and listing.		Schoff Creek	Concern
Shell Rock River Watershed Water Management Plan	North Fountain Lake was listed in 2008 as impaired for aquatic consumption. Fountain Lake's North, East and West Bays are impaired for aquatic consumption due to high levels of mercury in fish tissue. The North Bay was added to the impaired waters list in 2008 while East and West Bays were added to the impaired waters list in 2012. Fountain Lake receives over 50% of its phosphorus load from internal loading so District efforts to reduce internal loading are well targeted.		Fountain Lake	Concern
Shell Rock River Watershed Water Management Plan	Phosphorus in lakes has two primary sources: external and internal loading. External loading is a result of sediment and pollutants carried off the landscape by stormwater runoff and deposited into the lake by upstream waters. Internal loading is caused by phosphorus rich bottom sediments being released into the water column by a multitude of processes.		Fountain Lake	Concern
Shell Rock River Watershed Water Management Plan	Albert Lea Lake as impaired aquatic recreation due to excess nutrients		Albert Lea Lake	Concern
Shell Rock River Watershed Water Management Plan	Pickeral Lake, upstream of Albert Lea Lake, was also listed due to excess nutrients in 2008		Pickeral Lake	Concern
Shell Rock River Watershed Water Management Plan	White Lake was assessed as impaired for aquatic recreation during the same assessment cycle (2008)		White Lake	Concern
Shell Rock River Watershed Water Management Plan	Carp contribute to internal loading		Albert Lea Lake	Concern
Shell Rock River Watershed Water Management Plan	Upper and Lower Twin Lakes clarity fluctuate		Upper and Lower Twin Lake	Concern
Shell Rock River Watershed Water Management Plan	NitrateN concentrations have also increased in the Shell Rock River in recent years.		Shell Rock River	Concern
Shell Rock River Watershed Water Management Plan	Internal loading of nutrients	Yes		Concern
Shell Rock River Watershed Water Management Plan	Carp and other rough fish stir up lake sediments, increasing internal loading, and discharge of nutrients downstream.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Macrophyte and algae overproduction due to excess nutrients creates low and fluctuating dissolved oxygen conditions in streams and lakes	Yes		Concern
Shell Rock River Watershed Water Management Plan	Hydrologic changes such as stream channelization, tile drainage, draining of wetlands and loss of retention increases nutrient loads, hydrologic flow and sediment loads.	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Intercommunity flow issues			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Non-point source runoff			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Improper design. Location, installation, use and maintenance of SSTS can result in significant pollutant source to surface and groundwater			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Impaired waterbodies		Albert Lea Lake	Concern

Surface Water Quality

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Albert Lea Lake Watershed Management Plan DRAFT	Impaired waterbodies		Fountain Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Impaired waterbodies		Pickeral Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Impaired waterbodies		Shell Rock River	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Changing land use		Albert Lea Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Changing land use		Pickeral Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Feedlots	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Sedimentation in Albert Lea Lake		Albert Lea Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Sedimentation in Fountain Lake		Fountain Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Lake water quality is threatened or impaired	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Pollution hazard from failing SSTS	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Additional development is expected	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Development and redevelopment in the City	Yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #2 - Manage watersheds to reduce bacteria, nutrients, chemicals, and sediments from entering surface waters	Yes		Value
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #1 - Improve drainage water quality, understanding the systems are part of a larger tributary system	Yes		Value
Shell Rock River Watershed Monitoring and Assessment Report	3 Lakes Not Supporting Aquatic Consumption			Concern
Shell Rock River Watershed Monitoring and Assessment Report	5 Lakes Not Supporting Aquatic Recreation			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Modest to Poor Lake Water Quality			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Nutrient Eutrophication			Concern
Shell Rock River Watershed Monitoring and Assessment Report	No Assessed Streams Fully Support Aquatic Life			Concern
Shell Rock River Watershed Monitoring and Assessment Report	No Assessed Streams Fully Support Aquatic Recreation			Concern
Shell Rock River Watershed Monitoring and Assessment Report	High Bacteria Levels			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Transport of Ammonia From Fields Through Tile Drainage			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Manure Management Issue			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Animal Manure Contributions			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Fair to Poor Poor Macroinvert Biological Quality in Channelized Streams			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Good to Fair Biological Quality in Channelized Streams			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Point Source Discharges Contributing Pollutants			Concern

Surface Water Quality

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Monitoring and Assessment Report	Carp Stir Up Bottom Sediment and Resuspend Nutrients			Concern
Shell Rock River Watershed Monitoring and Assessment Report	High DO Flux			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Shell Rock River Once Considered a Dead River (Before New WWTP)		Shell Rock River	Concern
Shell Rock River Watershed Monitoring and Assessment Report	Shallow Lakes Suceptable to Wind Mixing			Concern
Shell Rock River Watershed Monitoring and Assessment Report	Low Dissolved Oxygen		Shell Rock River	Concern
Shell Rock River Watershed Monitoring and Assessment Report	Increasing Nitrate-N Levels			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Nutrients			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Dissolved Oxygen Flux and Low DO			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Ionic Strength			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	Low Flow			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High pH			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Suspended Sediments			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	Increasing Runoff			Concern
Shell Rock River Watershed Biotic Stressor Identification Report	High Algae			Concern
Winnebago River Watershed Stressor Identification Report	Bacteria Impairments			Concern
Winnebago River Watershed Stressor Identification Report	Low DO Impairment in Shell Rock River		Shell Rock River	Concern
Winnebago River Watershed Stressor Identification Report	Eutrophication Impairments			Concern
Winnebago River Watershed Stressor Identification Report	High Nitrate			Concern
Winnebago River Watershed Stressor Identification Report	High Suspended Sediments			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Land Cover Dominated by Row Crop Agriculture			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Eutrophication Impairmented Lakes			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Modified Use Thresholds, Lower Water Quality Expectations			Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Failing Fish and Invertebrate Scores			Concern
Watershed Report Card: Shell Rock River	Water Quality Health Score of 39			Concern
Watershed Report Card: Winnebago River	Water Quality Health Score of 62			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	High Suspended Sediments			Concern

Surface Water Quality

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	High pH			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	High Nutrients			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Failing SSTS			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Feedlot Runoff			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Phosphorus Release From Lake Sediments			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Phosphorus Release Curly-Leaf Pondweed			Concern
Shell Rock River Watershed Total Maximum Daily Load Implementation Plan	Sediment Disturbance by Bottom-Feeding Fish and Wind			Concern
Survey	The lakes and clean water			Value
Survey	Water quality, but usable water, not so much vegetation			Value
Survey	Clean water for our waterfowl and fishing lakes as well as recreation.			Value
Survey	clean water -- soil erosion- soil health - wildlife habitat			Value
Survey	Water quality for both Fountain Lake and Albert Lea Lake as well as other local lakes,rivers/streams.Getting rid of the algae from all bodies of water.Making the lakes clean enough for swimming		Fountain Lake, Albert Lea Lake	Value
Survey	Clean water, less runoff and long term damage and more native plantings. Also, the improvement in fish species in our area have been awesome for the area.			Value
Survey	Clean and navigational waterways and lakes (by lake dredging, upstream filtering and invasive species management, etc), preserving and improving ecosystems of wildlife especially fish and migratory birds and expanding the public access/enjoyment of area natural areas such as lakes, parks and wetlands.			Value
Survey	our lakes! pollinator gardens and buffer strips			Value
Survey	Increasing scale of agriculture including non-natural inputs that degrade soil health, lack of understanding of causes, increased urban and impervious surfaces without equal consideration to water quality.			Concern
Kickoff	I care about how clean the water across the landscape is			Value
Kickoff	I care about the lakes, AL lake esp. with ag land and industry		Albert Lea Lake	Value
Kickoff	Clean water trails and lakes for recreation			Value
Kickoff	The water quality of our lakes... maintain and improve			Value
Kickoff	I care about the quality of water available to animals and wildlife			Value
Kickoff	Clean water for recreating			Value
Kickoff	Cleaner water for recreation			Value
Kickoff	I care about clean water and keeping our lakes clean			Value
Kickoff	Clean water for healthy living			Value
Kickoff	I care about water entering Bear Lake			Value
Kickoff	Sustainability - we don't want watershed to go backwards in terms of quality			Value
Kickoff	I care about Bear Lake		Bear Lake	Value
Kickoff	Pollution not entering the lake			Value
Kickoff	Using plants to help clean water			Value
Kickoff	Clean water - both for drinking and in our lakes and streams			Value
Kickoff	Clean water drinking and lakes			Value
Kickoff	Water quality			Value
Kickoff	Water quality			Value
Kickoff	Good water quality			Value
Kickoff	Clean water surface and groundwater. Drinkable, swimmable and fishable			Value
Kickoff	Water quality, clean water, boating and fishing, swimming, etc			Value
Kickoff	I care about what is growing in our lakes and the safety to humans and animals and fish			Value

Surface Water Quality

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Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
Kickoff	In regards to our community (FC) natural environment I care about: 1. having clean/pure/safe water to drink on a continous basis, 2. Our parks, state park to visit, see wild animals, birds and native plants, 3. Our local parks where kids can play, 4. clean, pure air, 5. clean lakes in our community where we as citizens do NOT DUMP waste, plastic, paper etc in water or on land, cigarettes			Value
Kickoff	Using lakes as garbage receptacles			Concern
Kickoff	Major concern of clean water and safe water for humans, fish and animals			Concern
Kickoff	Lakes are impaired for nutrients			Concern
Kickoff	Water pollution, chemical runoff, urban and rural			Concern
Kickoff	Impacts from tile drainage (nutrients) causing issues in streams			Concern
Kickoff	I am afraid of my grandkids swimming in the lake we live on (Fountain) even though they have life preservers on, if they came off accidentally. They might be lost in the cloudy water and drown.		Fountain Lake	Value
Kickoff	Being able to fish and swim in water without getting sick (care about not having blue-green algae blooms)			Value
Kickoff	I am concerned with the health and water quality of our lakes			Value
Kickoff	Lakes that are not on the impaired list			Value
Kickoff	How to improve Albert Lea lake		Albert Lea Lake	Concern
Kickoff	Water pollution			Concern
Kickoff	Litter - fisherman and others			Concern
Shell Rock River Watershed Water Management Plan	Remove carp from lakes and restrict their movement	Yes		Concern
Shell Rock River Watershed Water Management Plan	Conserve and restore upland and wetland to provide natural buffering to upstream pollutants.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Stabilize and restore streambanks to decrease downstream loading of sediment.	Yes		Concern
Shell Rock River Watershed Water Management Plan	Achieve a net reduction in pollutant generation from urban areas by revising and applying the District Rules.	Yes		Concern
Shell Rock River Watershed Monitoring and Assessment Report	Rough Fish Removal on Pickeral lake and Tribs		Pickeral Lake	Strategy
Shell Rock River Watershed Water Management Plan	Reduce internal loading of phosphorus from the District's interconnected lakes and streams	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Improve water quality	Yes		Strategy
Shell Rock River Watershed Water Management Plan	Dredge and properly dispose of nutrient-rich sediments withint the District's lakes	Yes		Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Identify and plan for means to effectively protect and improve water quality in Albert Lea Lake and other waterbodies within the watershed	Yes	Albert Lea Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Rough fish control in area lakes	No	Albert Lea Lake White Lake Fountain Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Phosphorus loading to lakes and streams	Yes		Strategy
2019 05 29 Shell Rock 1W1P DNR Comments.pdf	Current water quality conditions for both lakes and streams point to a need for significant land use changes to reserve the pollutant loading trends. Work to address water quality goals established in WRAPS and TMDLs to prevent future Surface Water Quality impairments and groundwater contamination, improve fish habitat in lakes and streams, and promote the watershed's resilience to changing hydrology and climate, invasive species, and other stressors.	Yes		Strategy
Survey	Clean water -- testing to ID septic system compliance & sources of contamination - controlling erosion, Soil erosion -- enforce buffer strips -- plant cover crops - improve soil health to reduce need for fertilizing -- maintain wetland areas. Wildlife habitat - continue programs to be an incentive to take "marginal" land out of crop production to increase habitat and reduce erosion.			Strategy
Survey	The channel needs to be dredged and garbage needs to be removed regularly.People have been dumping tires in the channel near the boathouse recently			Strategy

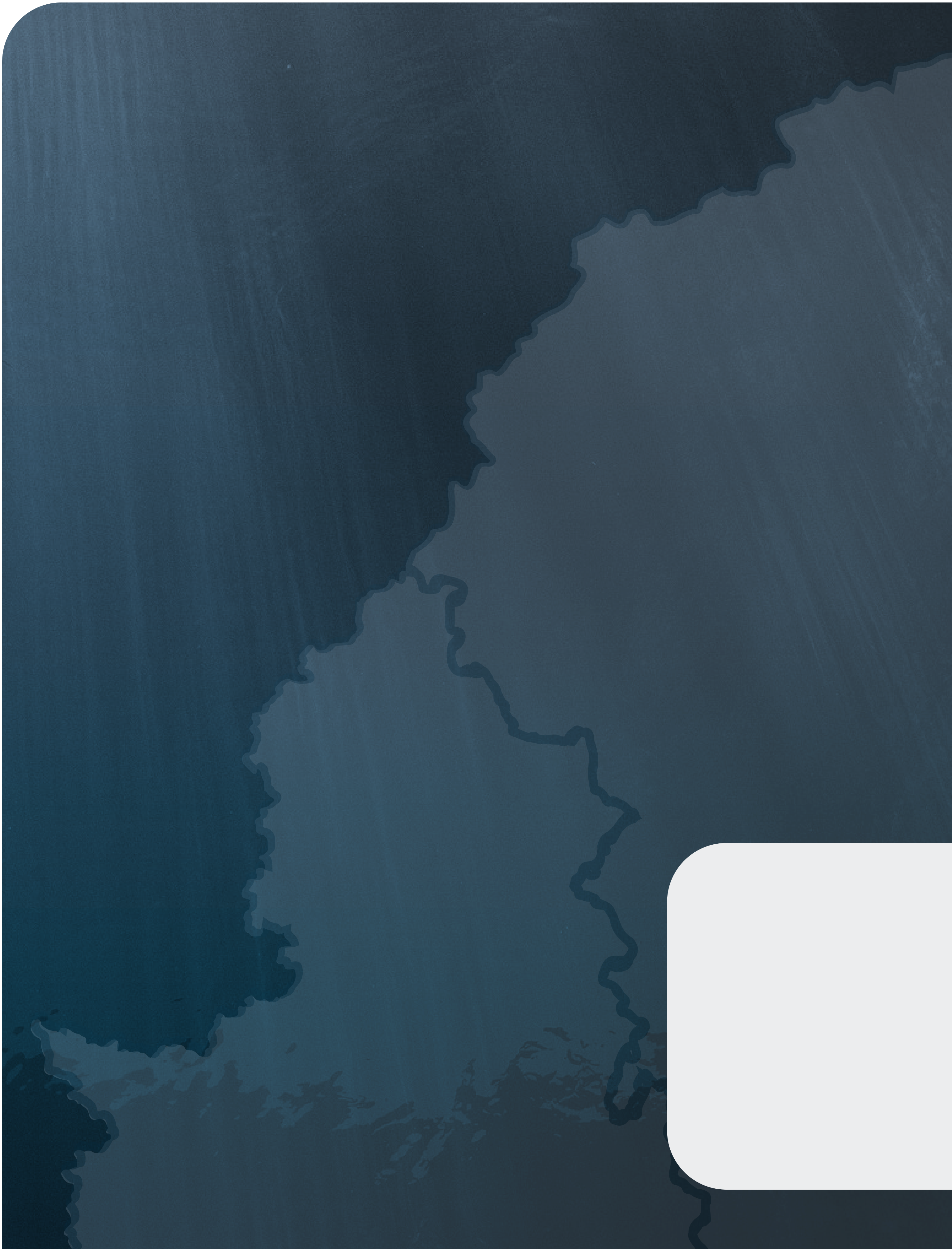
Water Rate & Quantity

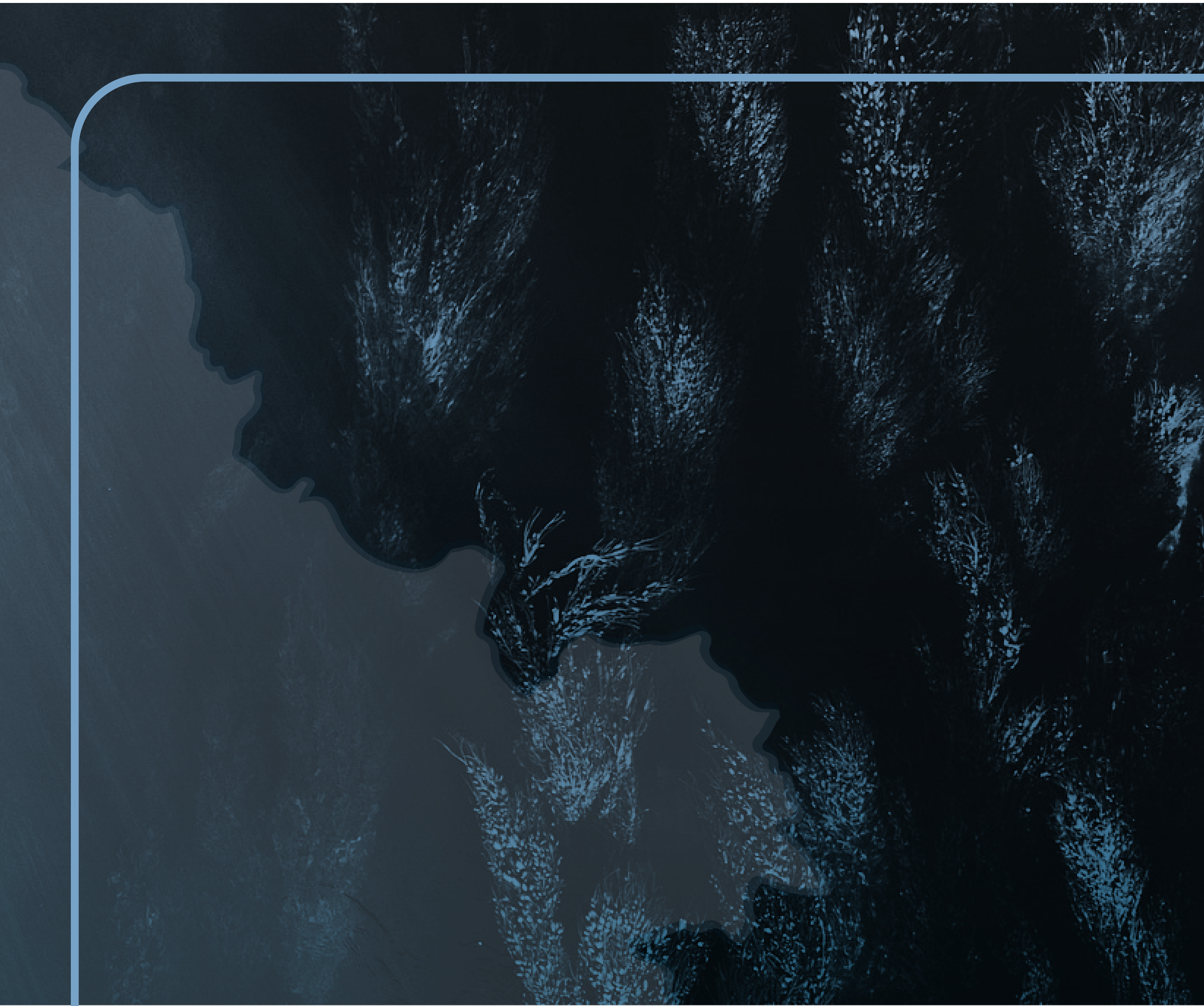
RESPONSE LETTERS WATER PLANS REPORTS PUBLIC COMMENTS

Draft issue statement:

Issue Source	Resource Issue	Priority Issue?	Specific Resource Identified	Category Type
BWSR response to notification Shell Rock Winnebago.docx	Landscape Resiliency and Climate Adaption – BWSR strongly encourages your planning partnership to consider the potential for more extreme weather events and their implications for the water and land resources of the watershed in the analysis and prioritization of issues. The weather record for the planning area shows increased frequency and severity of extreme weather events, which has a direct effect on local water management. Adjustments involving conservation and fieldwork planning and implementation should be explored; for instance, the use of an updated precipitation frequency chart such as the NOAA Atlas 14 when designing conservation projects. An additional source of information for use in the planning process is the BWSR Landscape Resiliency Toolbox. Finally, a new white paper from the Minnesota Interagency Climate Adaptation Team titled "Building Resiliency to Extreme Precipitation in Minnesota" also provides resiliency strategies related to this topic.	Yes		Concern
Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021	Goal #3 - Manage watersheds to control surface water runoff	Yes		Value
Shell Rock River Watershed Water Management Plan	Ditching and tiling create drainage in areas where infiltration used to occur.			Concern
Shell Rock River Watershed Water Management Plan	Extreme weather events			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Address local flooding issues within the City of Albert Lea and surrounding watershed	Yes	Albert Lea Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	The City of Albert Lea's "existing storm sewer system does not provide a 10-year level of service"			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Intercommunity flow issues			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Localized flooding			Concern
Albert Lea Lake Watershed Management Plan DRAFT	Additional development is expected	Yes		Concern
Albert Lea Lake Watershed Management Plan DRAFT	Development and redevelopment in the City	Yes		Concern
Winnebago River and Upper Wapsipinicon River Watershed Monitoring and Assessment Report	Increasing Precipitation Trend			Concern
Kickoff	I care about keeping the depth of our lakes			Value
Kickoff	Increasing water quantity via climate change and larger rain events			Concern
Kickoff	Bounce (depth variation) of the lake (Fountain)		Fountain Lake	Concern
Albert Lea Lake Watershed Management Plan DRAFT	Fountain Lake Dam and lake level control		Fountain Lake	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Protected flows in the Shell Rock River		Shell Rock River	Strategy
Albert Lea Lake Watershed Management Plan DRAFT	Repair/address localized areas of inadequate storm sewer capacity	Yes		Strategy

Water Rate and Quantity 1 of 1





APPENDIX D

RESOURCE PRIORITIZATION AND ISSUE STATEMENTS

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement A1: Surface Water Quantity
Resource Category: Surface Water

Landscape and channel alterations have caused adverse impacts to hydrology such as localized flooding. There is a risk of increased flooding due to inadequate storage and this risk is compounded due to increased rates of extreme weather events.

Desired Future Condition:

Eliminate localized flooding during extreme weather events.

Goal 1: Increase water storage to reduce downstream impacts

Measurable outcome: Implement projects that store 6,247 acre-ft over the 10-year planning period.

Restoring wetlands to treat runoff from 8,102 acres of existing cropland will create 6,899 acre-ft of cumulative water storage by the end of the 10-year plan period costing $6,099,600.

Soil Health Practices (cover crops and no-till) implemented on a total of 9,984 acres will provide 169 acre-ft of cumulative water storage by the end of the 10-year plan period costing $499,300.

Table 1 Water Storage Measurable Outcomes

Management Area	Restored Wetlands (acres)	Storage achieved from restored wetlands (acre-ft)	Soil Health Practices (acre)	Storage achieved from soil health practices (acre-ft)	Total Storage Gained (acre-ft)	Cost
Fountain Lake	391	3,186	5,568	175	3,361	$ 3,601,900
Albert Lea Lake	156	1,027	2,119	67	1,094	$ 1,435,400
Shell Rock River Outlet	101	1,379	1,339	30	1,409	$ 927,200
Winnebago Outlet	69	362	958	21	383	$ 634,400
Total	717	5,954	9,984	293	6,247	$ 6,598,900

Measure: increase acre-feet of storage for each targeted management area as determined by implementation of restored wetlands and cover crops or other soil health practices.

Frequency of measure: Biennial calculation of the amount of acre feet of permanent and temporary storage created**.**

Potential measures of level of effort/activity to address goal:

- Acre feet of storage that is created for each on-the-ground implementation action.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Targeting implementation activities:

- Target areas that provide multiple benefits for implementation of restored wetlands and cover crops.
    - The results (locations and amount of area treated) from the water quality scenarios were used to identify areas for water storage.
- Combine knowledge of landscape, relationships with landowners, and completed studies with targeted scenario results when it comes time for implementation.
    - Use cost effective heat maps from scenarios to guide outreach.
    - Target areas with established relationship and interest with landowners.
        - Peter Lund Creek drainage area
        - County Ditch 16 drainage area
    - Leverage existing studies that have identified areas suitable for water storage
        - Bancroft Creek drainage area (landowners initiated, WSB study was conducted with areas identified)
        - County Ditch 23 (Steward Creek) Drainage Water Management Plan
        - Draft TMDL Implementation Plan (Barr, 2013)
    - Use Restorable Wetland GIS layer or “Restorable Wetland Prioritization Tool” when selecting specific site locations during implementation process.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Goal 2: Reduce the frequency and intensity of flooding

Measurable outcome: Locations and duration of flooding in the City of Albert Lea will be documented. Building a record of localized flooding events will lead to a better understanding that will help drive future management decisions that will ultimately lead to a reduction in flooding incidents.

Measure: Project partners will continue to collect data regarding location and flood levels during each occurrence including:

- Number of roadway locations in Albert Lea that flood.
- Number of days each roadway location is flooded.

Frequency of measure: Event based.

Potential measures of level of effort/activity to address goal:

- Locations where flooding is likely to occur have been identified
- The geographic extent of flooding will be mapped

Targeting implementation activities:

- Target known flooding locations:
    - Lakeview Boulevard and Willamore Road (by Lakeview Park)
    - South Broadway and East 5th Street
    - West Main Street and St. Mary (by Morin Park)
    - Lincoln Avenue (gravel road to city garage)
    - South 4th Avenue and Plainview Lane
- Implement projects identified in previous studies to address known flooding issues:
    - TH 65 and Clarke: road will be raised
    - Projects from CIP (lift stations, rain gardens, etc)

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement A2: Surface Water Quality
Resource Category: Surface Water

Lakes and streams are threatened or impaired due to excess pollution including nutrients, sediment, and bacteria. These pollutants can cause eutrophication, impact aquatic life, and decrease recreational use opportunities.

Desired future condition:

All lakes and streams meet or exceed MPCA standards for aquatic life and recreational use.

The methods to determine priority lake and stream resources for targeting implementation activities are discussed separately below. In order to address changing resource conditions, staffing levels, and funding levels over the 10-year planning timeframe, an adaptive management approach will be developed. In doing so, thresholds for resource change will be established. When those thresholds are met, management protocols and actions will be reviewed and adjusted as necessary. Lakes and streams will be reevaluated on a biennial basis to incorporate changes over time.

In this document, lakes and streams are ranked according to metrics and data, but these resources are not yet prioritized as far as where implementation efforts should be focused. Prioritization will be done in tandem with the development of the implementation table so that the level of effort needed to meet goals can be evaluated.

Goal 1: Improve lake water quality by decreasing total phosphorus concentrations

Measurable outcome: Average summer total phosphorus (TP) concentrations will be reduced for the top three priority lakes with TMDL studies completed (Fountain Lake, Albert Lea Lake, and Pickerel Lake) while current TP concentrations will be maintained for the remaining lakes.

Table 2. Lake Measurable Outcomes

Lake ID	Lake Name	Existing TP Load (lbs/yr)	Existing Concentration (ug/L)	10-yr TP Target Concentration (ug/L)
24001400	Albert Lea*	82,876.60	219	207
24002500	Pickerel*	3,541.40	147.7	143
24001800	Fountain Lake West*	21,095.70	272	256
24001800	Fountain Lake East*	53,766.70	259.7	244
24003000	State Line*	22,141.40	550	N/A
24002400	White*	915.5	178.8	
24002800	Bear*	39,503.80	262	

24001700	Goose***		190
24003100	Upper Twin**	7,325.00	267.4
24002700	Lower Twin**	4,739.30	170.2
24003800	Halls***		99.7
24004000	School Section**	2,174.50	365.9
24006800	Mud***		147
24003700	Sugar**	1,062.60	84

Source: *BATHTUB model/TMDL, **LPSS, ***Observed

Measure (units): average TP (µg/L), chl-a (µg/L), and secchi disk depth (m) in lakes from May-September.

Frequency of measure: To be determined on a lake by lake basis; dependent on monitoring schedules.

Potential measures of level of effort/activity to address goal:

- Use monitoring data and model scenarios to measure:
    - The reduction in the amount of phosphorus entering the lake from watershed runoff.
    - The reduction in the amount of phosphorus from internal loading due to in-lake management activities.

Targeting/Prioritizing Lakes:

- Priority lakes were identified following the approach described below with the results presented in Table 5.
- Targeting implementation:
    - Using modeling data and the spreadsheet targeting tool, scenarios were run to present the Steering Committee with expected measurable outcomes and costs. The base scenario used the current level of implementation which was provided by Steering Committee team members. This was then built upon based on expected increases in funding. It was determined that funding has been the main limiting factor in implementation across the Shell Rock and Winnebago watersheds. Increases in implementation above the current levels were allocated to priority management areas. These priority management areas were determined based on Steering Committee Member's feedback and location of priority lakes using the below lake metric analysis. A final draft scenario was created based on this guidance and was used to develop the draft measurable outcomes, costs, and targeting of implementation efforts between management areas.

- During implementation, a cost effectiveness heatmap will be used to target outreach efforts for specific BMPs.

Data Sources Used:

Prioritization of lakes for TP reduction was completed using the methods described below. There are two sources of data that were used. The first source is the 2019 Shell Rock River Watershed District monitoring data and the second is the 2019 LPSS, LBCA, LOBS spreadsheet provided by the MPCA, which evaluates data collected through 2018.

Methods:

Five metrics were used to evaluate lakes: lake size to drainage area, lake land use disturbance, percent mean phosphorus (P) from standard, water clarity trend, and economic and recreational importance. A summary of each of these metrics and scoring methods are outlined in Table 1. The values for all lake metrics except trend were scored using a percent rank function. Lake ranking for each metric is shown in Table 2. All ranking scores were averaged per lake and then ranked according to this average. The final ranking is shown in Table 3.

1. **Lake Size to Drainage Area Ratio**
   - What - The characteristics of the lake and a rough estimate of residence time which can indicate how upstream land uses vs. in-lake processes influence lake water quality.
   - Why - Lakes with a larger lake to watershed ratios may require more restoration effort and require a longer period of time for restoration efforts to result in lake water quality improvements.
2. **Lakeshed Land-Use Disturbance %**
   - What - The percentage of land use that has changed from its original condition or has been converted to agricultural or urban land uses.
   - Why - Land cover is an important factor in determining the health of downstream waterbodies. Typically, the greater the area that has been converted from its native land use or perennial cover, the greater the impact on downstream waters. Protecting existing, native land cover in watersheds that have a low percentage of disturbance may be an important tool for maintaining high water quality lakes and streams.
3. **Percent Mean P from P Standard**

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- What - Lakes that are closer or further from meeting the water quality standard (deep or shallow).
- Why - Addressing lakes that are close to the water quality standard provides some assurances that these lakes will not decline into an impaired state.

4. **Water Clarity Trend**
   - What - the MPCA monitors water clarity data in lakes to evaluate historic and current conditions. From these data, trends are identified that reflect both historic management successes as well as inform the continuing challenge of controlling the more diffuse “nonpoint” polluted runoff sources and the impacts of increased water volumes from artificial drainage practices.
   - Why - Understanding which resources that are experiencing an improving or declining trend in water quality allows stakeholders to initially focus efforts on these lakes, particularly as it relates to how close the lake is to meeting water quality standards.
5. **Economic and Recreational Importance**
   - What - The value of each lake based on the recreational and economic value of each lake. The recreational value was based on the uses provided by each lake which included fishing and hunting. Economic value was based on the tax value, recreational value, and density of population surrounding each lake.
   - Why - Quantifying each lakes “value” to the local community based on economic and recreation is important when considering what lakes are important to the local community. Lakes that provide high value in both of these categories offer a large return on investment of restoration resources.

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SUMMARY RESULTS

Lakes ranked from 1 to 13 using this draft criterion are listed below.

1. Albert Lea
2. Pickerel
3. Fountain Lake
4. State Line
5. White
6. Bear
7. Goose
8. Upper Twin
9. Lower Twin
9. Halls
11. School Section
12. Mud
13. Sugar

Table 3. Summary of DRAFT Lake Prioritization Criteria

Priority Value Metric	Scoring
Lake Size to Drainage Area Ratio	Values for lakes ranged from 5.2 to 428.5. Values were ranked using a percent rank function with low ratios having a higher rank and high ratios having a lower rank between 0 and 1.
Lakeshed Land-Use Disturbance %	Values for lakes ranged from 47 to 90%. Values were ranked using a percent rank function with high percent disturbance having a higher rank and lower percent disturbance having a lower rank between 0 and 1.
% Mean P from P Standard	Values for lakes ranged from impaired to 44% below the standard. Values were ranked using a percent rank function with lakes closer to the standard (worse water quality) given a higher rank between 0 and 1.
Water Clarity Trend (evaluated using both improving and declining trend)	Lakes with an increasing clarity trend were given a rank of 1, lakes with no trend or not enough data for a trend were given a 0.5, and lakes with a decreasing trend were given a 0. No lakes were noted to have a decreasing trend.
Economical and Recreational Importance	Both recreation and economic values were given a score from 1 to 3 resulting in a total combined score ranging from 2 to 6. Final scores were ranked using a percent rank function with high scores ranking higher and low scores ranking lower. Economic and Recreational Importance scores were given a weight of 2 times other metric values in the final rankings. Recreation: Lakes providing both fishing and hunting recreational uses were scored 3, lakes with one were scored 2, the rest of the lakes were scored 1. Economic: Lakes with high tax values and dense population surrounding lake and high recreational value were scored 3, lakes with some but not all of these were scored 2, and lakes with no residences or recreation were scored 1.

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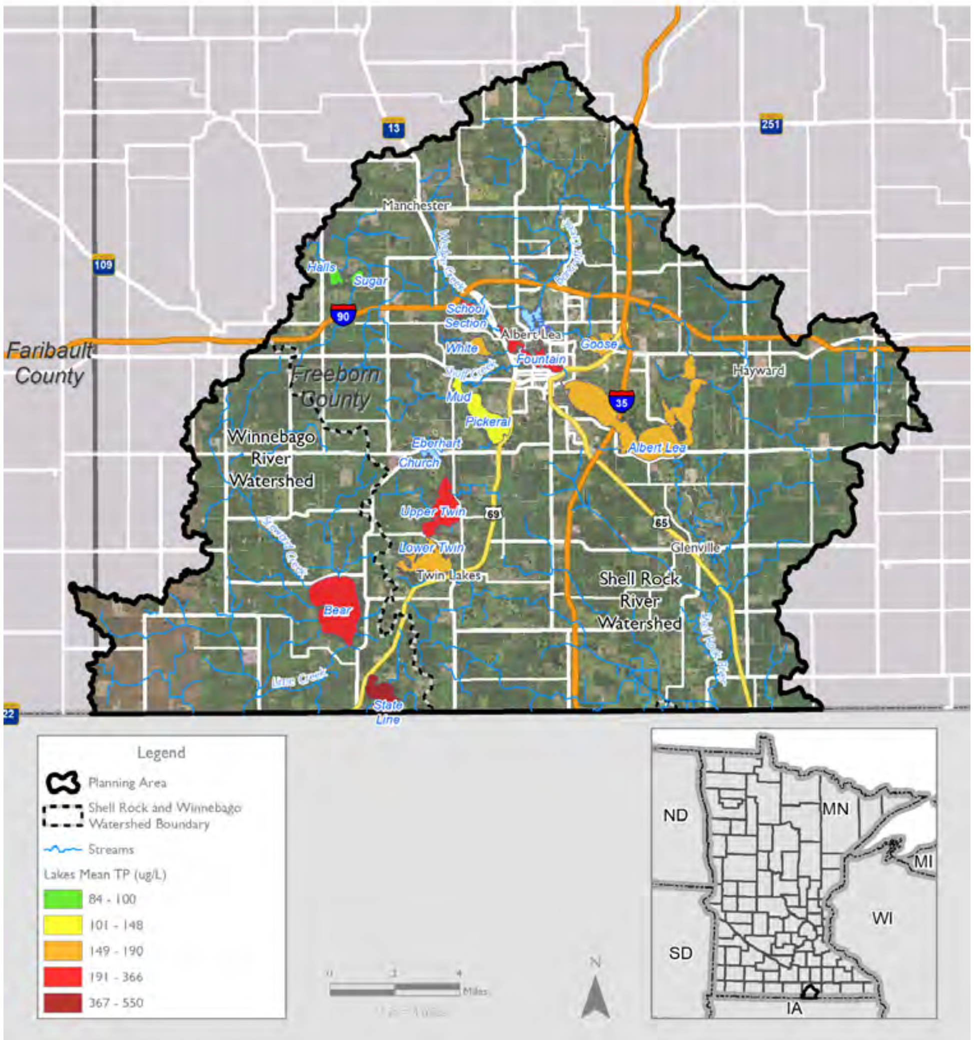

Figure 1. Map of Shell Rock River/Winnebago River Lakes with Mean Total Phosphorus Concentrations

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Table 4. Ranking Metrics Using Draft Criteria for Shell Rock River/Winnebago River Lakes.

Lake ID	Lake Name	Lake Size to Drainage Area Ratio	Lake Land-Use Disturbance	Percent from Standard	Trend	Recreational Importance	Economic Importance	Total Economic and Recreational Importance
24001400	Albert Lea	35.2	86%	-48%	Increasing trend	3	3	6
24002500	Pickerel	6.3	78%	2%		3	3	6
24001800	Fountain Lake	161.6	86%	-76%	No evidence of trend	3	3	6
24003000	State Line	8.19	76%	-185%	Increasing trend	2	2	4
24002400	White	6.9	47%	-19%	Increasing trend	2	3	5
24002800	Bear	24.1	90%	-72%	No evidence of trend	2	1	3
24003100	Upper Twin	48.6	77%	-91%		2	1	3
24001700	Goose	40.8	83%	-27%		1	2	3
24002700	Lower Twin	24.7	71%	-13%		2	1	3
24003800	Halls	515.4	87%	40%		2	1	3
24004000	School Section	5.2	48%	-183%		1	1	2
24006800	Mud	17.3	59%	-175%		1	1	2
24003700	Sugar	57.8	85%	44%		1	1	2

Table 5. DRAFT Ranking Scores for Shell Rock River/Winnebago River Lakes.

Lake ID	Lake Name	Lake Size to Drainage Area Ratio Score	Lakeshed Land-Use Disturbance Score	Percent From Standard Score	Trend Score	Economic and Recreational Importance Score	Overall Score	Rank
24001400	Albert Lea	0.42	0.83	0.50	1	0.83	1.72	1
24002500	Pickerel	0.92	0.50	0.17	0.5	0.83	1.58	2
24001800	Fountain Lake	0.08	0.75	0.67	0.5	0.83	1.57	3
24003000	State Line	0.75	0.33	1.00	1	0.67	1.55	4
24002400	White	0.83	0.00	0.33	1	0.75	1.48	5
24002800	Bear	0.58	1.00	0.58	0.5	0.25	0.88	6
24003100	Upper Twin	0.25	0.42	0.75	0.5	0.25	0.73	7
24001700	Goose	0.33	0.58	0.42	0.5	0.25	0.72	8
24002700	Lower Twin	0.50	0.25	0.25	0.5	0.25	0.65	9
24003800	Halls	0.00	0.92	0.08	0.5	0.25	0.65	9
24004000	School Section	1.00	0.08	0.92	0.5	0.00	0.50	11
24006800	Mud	0.67	0.17	0.83	0.5	0.00	0.43	12
24003700	Sugar	0.17	0.67	0.00	0.5	0.00	0.27	13

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Goal 2: Improve stream water quality by reducing E. coli, nutrient, and TSS source loading and implementing practices that reduce flow alteration.

Measurable Outcome:

- Since E.coli is naturally occurring in streams it is difficult to measure the direct relationship between watershed improvement practices and the resulting change in stream E.coli concentrations. Therefore, the measurable outcome for reducing E.coli in streams will be based on the number of implementation actions/projects put in place to address E.coli.
  - Replace and/or upgrade 40 failing or non-compliant septic systems.
  - Bring non-compliant feedlots into compliance (1 non-compliant in Shell Rock, 2 non-compliant in Winnebago)
  - Ensure feedlots that are expanding maintain necessary management practices.
- Minimum daily dissolved oxygen (DO) concentrations will be above 5 mg/L and mean growing season DO flux will stay below 5 mg/L for stream reaches with current monitoring.
- For streams that are not monitored for DO, measurable goals will be established for total phosphorus or total suspended solids concentrations.
  - WQ goals were established for TP and TSS based on the spreadsheet targeting tool's scenario run for the Wedge Creek, Bancroft Creek, Shoff Creek, and Peter Lund Creek outlets. The final scenario will be run through HSPF/SAM to generate concentrations. Draft load reductions that will be achieved by the end of the planning period are shown in the table below.

Table 6. Priority River Outlet Measurable Outcomes

Management Area	TP Reduction (lbs/yr)	TSS Reduction (tons/yr)	Cost
Wedge Creek Outlet	1,222	224	$ 1,874,650
Bancroft Creek Outlet	1,434	237	$ 1,969,050
Shoff Creek Outlet	535	87	$ 431,200
Peter Lund Creek Outlet	1,177	142	$ 1,567,150
Total	4,368	690	$ 5,842,050

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Measure (units):

- E.coli outcomes will be measured by tracking the number of septic systems replaced per year, number of feedlots brought into compliance per year, and number of feedlots that expand which require additional management actions per year.
- DO (mg/L) will be measured using a calibrated Sonde
- Use HSPF/SAM to track progress at outlets of Wedge Creek, Bancroft Creek, Shoff Creek, and Peter Lund Creek towards the measurable goals and use monitored data where available to validate modeled results.

Frequency of Measure:

- E.coli - biennial evaluation of implementation level of effort.
- Annual monitoring of minimum DO concentrations and DO flux during sonde deployment using protocol identified above.
- Annual progress tracking using HSPF/SAM and monitoring data where available.

Potential Measures of Level of Effort/Activity to address goal:

- Tracking via e-Link or similar BMP database
- Track pathogen reducing, nutrient reducing, sediment reducing, and habitat improving implementation practices/expected reductions annually, and assess whether the resources improvement goal was achieved using in-stream monitoring data on a five-year basis.
- Track miles of improvement and implementation of practices/expected improvements annually.
- Evaluate using SAM where applicable

Targeting implementation activities:

- Priority stream reaches were selected based on being major drainages to the priority TMDL lakes. Therefore the implementation actions to achieve the TP and TSS measurable goals for the priority streams are met through achieving the lake implementation actions.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement #B1: Erosion and Sediment Control
Resource Category: Surface Water

Increased and accelerated runoff have caused elevated or fluctuating water levels which result in shoreland and streambank erosion. There is increased erosion and sedimentation issues from streambanks and shoreland areas as well as from land management practices. These impacts may be compounded due to increased rates of extreme weather events.

Desired Future Condition:

Excessive erosion and sedimentation is controlled.

Goal 1: Reduce overland runoff

Measurable outcome:

- Implement urban stormwater management practices in the City of Albert Lea over the 10-yr plan period
  - Install a minimum of two raingardens
  - Install a minimum of two retention ponds
  - Install a minimum of two stormwater ponds
  - Replace two Sweeper units
- TSS reductions achieved through implementing BMP's callout out in Issue Statements A1 and A2.
- Increase/Promote awareness of stormwater management (i.e. street sweeping) in smaller urban areas.

Measure:

- Number of urban BMPs implemented

Frequency of measure: Biennial

Potential measures of level of effort/activity to address goal:

- Tracking via e-Link or similar BMP database.
- Annual tracking and reporting of 6 minimum control level activities as required by the MPCA permit.

Targeting implementation activities:

- Identified areas for urban stormwater practices based on previous studies.
- Target smaller urban areas for awareness.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Goal 2: Reduce shoreline and streambank erosion.

Measurable outcome: Stabilize a minimum of 9,800 linear feet of eroding and failing streambanks and shoreline and complete inventory of failed streambanks.

Measure:

- Linear feet of streambanks and shoreline stabilized (portion of known bank failures).
- Identify how many streambank assessments should be completed to identify potential opportunities for other streambank restoration projects.
    - Conduct inventory of failed streambanks

Frequency of measure: Biennial

Potential measures of level of effort/activity to address goal:

- Tracking via e-Link or similar BMP database

Targeting implementation activities:

- Target areas identified in failing streambank inventory:
    - Shell Rock Watershed District inventory of failing banks.
        - Shoff Creek; Starting at Parcel 341650250, roughly 1400ft
        - Bancroft Creek; Starting at Parcel 130280061, roughly 8000ft
        - (Lake shore) Albert Lea Lake Parcel 343250050 400ft
- Conduct inventory of streambanks where one has not already been completed.
- Following results of inventory target additional stretches with failed streambanks.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement b2: Protect Soil Health
Resource Category: Natural Resources

Degraded soil health conditions have resulted in reduced agricultural production, decreased nutrient and water holding capacity, decreased infiltration, and increased erosion across the landscape.

Desired Future Condition:

Implement practices to improve soil health which will lead to increased agricultural production, increased nutrient and water holding capacity, increase infiltration, and decrease erosion. Adopting practices to increase soil health such as planting cover crops, practicing reduced or no tillage, crop rotations, and rotational or prescribed grazing will help achieve the five soil health principals: soil armoring, minimizing soil disturbance, plant diversity, continual live plant/root, and livestock integration.

Goal 1: Better understand current soil health conditions in the planning area.

Measurable outcome: Identify and quantify the existing efforts to improve soil health across the planning area while maintaining current outreach and education (1 winter workshop, 1 fall field day, roughly 12 posts on FB per year, enter information into Farming in the Heartland twice a year, provide No-Till Farmer Online/Magazine Subscriptions to local landowners)

Measure (units):

- Number of acres using soil health (cover crops, reduced or no tillage, rotational grazing) practices
- Number of research and education activities

Frequency of measure:

- Annual tracking of acres using soil health practices
  - This methodology is subject to change and will use the best available information. Approach may include: Field surveys, information from NRCS, e-link, satellite imagery, GIS analysis.
- Biennial tally of activities (# of events, # of participation # of website hits, etc)

Analysis and Assessment:

- Assessment of current soil health practices and evaluate changes in adoption and soil health conditions over the life of the plan.

Potential measures of level of effort/activity to address goal:

- Track number of research and education activities to understand soil health held in the project area

Targeting implementation activities:

1. Use best available information identify existing efforts across the entire planning area
2. Project area-wide awareness campaigns for O&E

Goal 2: Increase the number of soil health practices on agricultural land.

Measurable outcome: 9,984 acres of newly implementing soil health practices.

Measure (units):

- The number of acres implemented for each soil health practice
- BWSR tillage assessment

Frequency of measure:

- Biennial tracking of acres enrolled; document change over time.

Potential measures of level of effort/activity to address goal:

- Track acres of soil health practices installed on cropland via e-Link or similar BMP database
- BWSR new GIS analysis layers to show implementation of conservation tillage and cover crops
- Potentially enroll a sample of producers willing to have testing done to assess primary soil health characteristics.
- Leverage accepted approach to estimate the water storage gained by adoption of soil health practices.

Targeting implementation activities:

- Target priority management areas and areas within the management areas that provide multiple benefits (cost effective pollutant reduction).
- Leverage relationships with willing landowners.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement C1: Protect Sites of High Ecological Value
Resource Category: Natural Resources

The remaining sites of high ecological value are at risk of degradation and may need protection and enhancement.

Desired Future Condition

Significant portions of native habitat have been restored. Resources of high ecological value are protected and expanded.

Goal 1: Protect and enhance outstanding, high, and moderate biologically significant areas in the Shell Rock – Winnebago River Watershed

Measurable outcome: Enhance 1,527 acres of biologically significant areas and expand protected area adjacent to biologically significant areas.

Protect: Land held in perpetual easement as well as state and federal lands.

Enhance: Remove/replace less desirable or invasive plants with native plants.

Restore: Create new habitat by changing landuse (i.e. changing row crops to native planting).

Measure:

- Number of acres of high ecological value and critical habitat maintained and enhanced.
- Number of acres of easements established surrounding high ecological and critical value habitat.
- Number and acres of protected habitat that is enhanced

Frequency of measure: Biennial

Targeting implementation activities:

- Leverage projects already identified
- Target protection of critical habitat areas based on:
  - Current rank (High/medium/low)
  - Proximity/adjacent to areas of biological and biodiversity significance
  - Size of basin for enhancement potential.
  - Willing landowners

Scenario spreadsheet results (multiple benefits)

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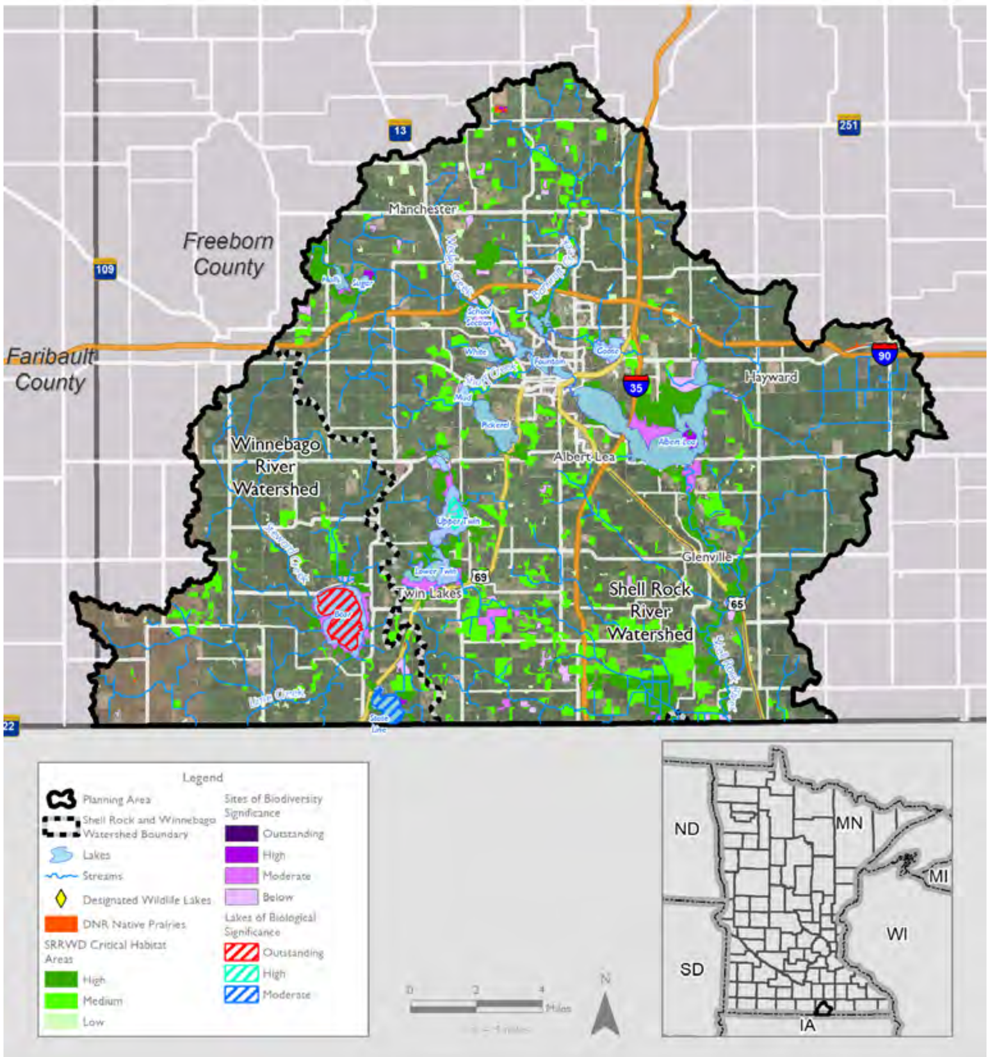

Figure 2. Biologically Significant and Critical Habitat Areas

C1: Protect sites of High Ecological Value Issue Framework June 8, 2020

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Issue Statement C2: Restore Wetland and Upland Habitat
Resource Category: Natural Resources

Land use alterations have reduced, degraded, and decreased the quality and abundance of upland and wetland habitat.

Desired Future Condition

Significant portions of upland and wetland areas are restored.

Goal 1: Restore altered wetlands and degraded upland habitat.

Measurable outcome:

1. Restore 1,728 acres of upland habitat.
2. Restore 8,630 acres of wetland habitat.
    - 8,102 (restored wetlands) plus an additional 528 acres from projects identified below.

Measure:

- Number of acres of newly restored upland areas and conversion to perennials.
- Number of acres of newly restored wetlands (includes newly restored wetlands and restoring degraded habitat in existing wetlands).

Frequency of measure: Biennial

Analysis and Assessment:

- Tracking via e-Link for projects that are implemented within BWSR grants that utilize e-Link or similar BMP database
- GIS analysis

Targeting implementation activities:

- Target wetlands based on:
    - Multiple benefits: targeting for upland water storage locations and water quality benefits.
    - Wetlands with known degraded habitats.
        - Miller Track/Orr Wetland 240 acres 090060020, 090060013 (and many other parcels)
        - Vandegrift wetland 140362022, 20 acres

        - Bancroft Wetland restoration 50 acres 130210030, 130160060
        - Pickerel Lake Property 080190090 080200380 and others, 218 acres (with upland)
    - Restorable wetland tool
- Target upland habitat areas based on:
    - Multiple benefits: areas identified in scenario that provide water quality benefits.
    - Areas with poor soils for farming
    - Areas adjacent to critical habitat complexes
    - Size of restoration project (larger being better)

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement C3: Groundwater Quantity and Quality
Resource Category: Groundwater

Groundwater and drinking water supplies are threatened by human actions as well as naturally occurring contaminants. There may be areas that have low groundwater volume which could be impacted by high-capacity wells.

Desired Future Condition

To have sustainable, drinkable groundwater.

Goal 1: Reduce the risk of groundwater contamination

Measurable outcome:

- Track Nitrate test results above 3.0 mg/L
- Ammonia levels in groundwater used for drinking water in the City of Albert Lea do not exceed 0.2 mg/L
- Replace and upgrade 40 failing or non-complaint septic systems.
- Bring non-compliant feedlots into compliance.
- Ensure feedlots that are expanding maintain necessary management practices.
- Seal 5 unused or abandoned wells per year.
- O&E to increase awareness on Arsenic in groundwater.

Measure:

- The number of wells tested and the % of those that are above 3.0 mg/L
- Average annual ammonia level in groundwater used for drinking water
- Number of septic systems replaced per year
- Number of feedlots that expand requiring additional management actions per year.
- Number of wells sealed per year.

Frequency of measure: Biennial

Analysis and Assessment:

- Community well testing events
- MDA Township Testing Program
- Freeborn County Feedlot Program

Targeting implementation activities:

- Target well sealing based on public input and requests.
- Drinking water supply management area (DWSMA) vulnerability is moderate or high; or
- Pollution sensitivity to wells is high; or
- Pollution sensitivity to near surface materials is high; or
- Karst regions; or
- Well testing show ≥ 5 mg/L nitrate
- Freeborn County septic inventory (in the Winnebago)

Implementation Strategies:

- Manure management planning and implementation
- Septic System upgrades
- Feedlot upgrades and treatment of runoff
- Promote nutrient management practices for agricultural audiences and low-input lawn care practices for residential audiences through outreach and education events, workshops, and on-line distribution of materials.
- Increase the number of acres using cover crops to scavenge nutrients.

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Issue Statement D1: Improve Degraded Aquatic Habitat
Resource Category: Natural Resources

Fish and macroinvertebrate populations are threatened by a lack of habitat, poor biological quality, channelized streams, altered hydrology, and poor water quality due to high sediment loading and algal blooms.

Desired Future Condition

Habitats that fully support fish and macroinvertebrate communities.

Goal 1: Restore aquatic habitat

Measurable outcome:

- Implement projects targeting biologically impaired stream reaches that address causes identified in Stressor I.D. report.
  - Includes upland BMPs identified in scenario results as well as streambank stabilization projects.
- Restore habitat in shallow lakes.
  - Restore State Line Lake habitat (372 acres) from drawdown right now.
- Track change in macroinvertebrate index of biological integrity (MIBI) and fish index of biological integrity (FIBI) scores as new data is made available by MPCA.
- Restore habitat in Fountain lake
  - Dredging
  - In-lake habitat restoration by creating in-lake habitat structures for improved fisheries habitat.
- O&E on shoreland management and benefits of maintaining buffer along shoreline.

Measure:

- Number of projects that provide multiple benefits and address areas with known degraded habitat.
- Track IBI score changes when next SID report is completed.
- Number of shallow lake habitat restoration projects
- Number of habitat restoration projects on Fountain Lake

Frequency of measure: Biennial

Analysis and Assessment:

- Tracking/spreadsheet analysis

- Watershed Monitoring Report

Considerations/Notes regarding analysis and assessment:

- The MPCA 10-year intensive monitoring and assessment must be completed regularly to evaluate changes and improvements.

Targeting implementation activities:

- Waterbodies with projects already identified. (Draft TMDL Implementation Plan Barr, 2013)
- Waterbodies with habitat potential.
- Streams with multiple benefit opportunities:
    - Stream reaches with stressors (from stressor ID) that align with other pollutants targeted in higher priority goals.

Goal 2: Decrease rough fish population, abundance, and distribution.

Measurable outcome:

- Maintain rough fish so they do not exceed desirable levels (100lbs/hectare)

Measure:

- Number of rough fish kills annually, and number of fish barriers installed
- Pounds of fish removed from lakes via fish kills and carp harvesting
- Number of radio-telemetry fish to assist in winter removal and tracking efforts.

Frequency of measure:

- Biennial

Analysis and Assessment:

- Tracking of fish kills and barriers with tracking/spreadsheet
- Surveys of lakes where attempts to reestablish native aquatic vegetation were made
- AIS infestation list
- DNR aquatic plant surveys
- DNR fish stocking data

Considerations/Notes regarding analysis and assessment:

- Monitor populations of rough fish in specified lakes over time must be completed regularly to evaluate changes.

Targeting implementation activities:

- Lakes with projects already identified
- Lakes with internal loading issues and known populations of rough fish
- Number of aquatic invasive species management plans developed when needed

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Goal 3: Enhance and restore native aquatic vegetation

Measurable outcome: Increased seeding and planting of native plant during restoration and O&E on impacts from certain water recreation sports.

Measure:

- Number of acres of native aquatic reestablished
- Number of aquatic acres with improved and increased vegetation

Frequency of measure: Biennial

Analysis and Assessment:

- Surveys of lakes where attempts to reestablish native vegetation were made
- Use the DNR rating scale from their lake management plans and sets thresholds for management intervention.

Considerations/Notes regarding analysis and assessment:

- Monitoring must be completed regularly to evaluate change over the 10-year planning period

Targeting implementation activities:

- Leverage existing efforts that are being undertaken by all partners and stakeholders
- Incorporate native plant restoration into future projects where appropriate
- Target priority lakes

Issue Statement D2: Invasive Species
Resource Category: Natural Resources

Invasive species threaten the health and quality of upland, wetland, riparian, and aquatic ecosystems. Invasive species need to be controlled to reduce their impact.

Desired Future Condition

Invasive species have been controlled and no longer impact native ecosystems.

Goal 1: Reduce aquatic invasive species impact to waterbodies

This includes all aquatic species such as invasive carp, curly leafed pondweed and Chinese mystery snails.

Measurable outcome:

- Manage lakes with aquatic invasive species identified.
  - Invasive carp management will follow the same outcomes and measures identified in Issue D1 - Improved degraded habitat, Goal 2 - Decrease rough fish population and abundance.
  - Treatments for curly leafed pondweed
- Outreach and education events on invasive species management (educate on all aquatic invasives)
  - Topics shared monthly via watershed districts Facebook page and information in watershed district's email chain 3 times per year.

Measure:

- Number/type/amount of AIS to control in specified lakes
- Number of treatments on curly leafed pondweed
- Number of outreach and education events
- Monitor known aquatic invasive infestations.

Frequency of measure: Biennial

Analysis and Assessment:

- Surveys of lakes and areas with where attempts to control AIS were made
- Create track surveys
- Electrofishing to get biomass index of rough fish

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Considerations/Notes regarding analysis and assessment:

- Surveys need to be completed regularly to evaluate changes over time

Potential measures of level of effort/activity to address goal:

Targeting implementation activities:

- Target lakes with existing projects identified.
    - Pickerel Lake
    - White Lake
    - Fountain Lake
    - Albert Lea Lake
- Target strategic placement from past efforts for fish barriers (headwaters lakes, chain of lakes, Bancroft creek)
- Tagging of rough fish on popular fishing lakes
- Pit tagging to measure accuracy of fish barriers
- Target priority lakes infested with curly leafed pondweed
- Lakes with known aquatic invasive vegetation infestations
- Education and outreach to prevent introduction of invasive species such as zebra mussels

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Goal 2: Reduce the area of wetland and upland impacted by invasive species

This includes species such as purple loosestrife, buckthorn, wild parsnip, and Canadian thistle.

Measurable outcome: Implement invasive species management plans to reduce impacts from invasive species

Measure:

- Annual aggregation of information from invasive species management plans. Information may include;
    - Number of invasive species present in a defined habitat
    - Acres of infestation
    - Number of habitat areas or waterbodies infested in watershed
    - Standardized surveys

Frequency of measure: Biennial

Potential measures of level of effort/activity to address goal:

- Identify annually:
    - Number of infested habitat areas or waterbodies with invasive management plans established
    - Number of inspection sites
    - Number of sites and number of acres where invasive species control efforts were implemented.

Targeting implementation activities:

- Target invasive species management actions tied to upland habitat projects identified in higher priority goals.
- Infested areas within close proximity to high quality habitat

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

Goal 3: No newly detected invasive species will become established

Measurable outcome:

- Maintain existing level of aquatic invasive species watercraft inspections
- Establish one early detection and rapid response plan for a priority lakes
- Share aquatic invasive species topics monthly via watershed districts Facebook page and information in watershed districts email chain 3 times per year.

Measure:

- Track efforts being taken to conduct monitoring and outreach

Frequency of measure: Biennial

Potential measures of level of effort/activity to address goal:

- Identify biennial the number of:
  - County Sheriff training
  - infested waterbodies
  - new watercraft inspectors at lakes
  - species of concern detected in the watershed
  - rapid response plans established for lakes
  - lake associations (I would say community instead of lake associations) monitoring for AIS
  - community/public outreach events
  - informational campaigns/radio advertisements.

Considerations/Notes regarding analysis and assessment:

- Coordinate with the County Highway (Ag Inspector) department and townships reporting to identify potential areas of infestation
- MNDNR invasive species inventories
- Leverage information and resources from collaborative resources such as the Midwest Invasive Plant Network, among others.

Targeting implementation activities:

- Prioritize popular recreation lakes with high traffic public landings
- Target water users/lakeshore owners with outreach and education materials.

Issue Statement E1: Groundwater Protection
Resource Category: Groundwater

Groundwater recharge areas (and particularly karst areas and course textured soils) of watershed within the Planning Area are vulnerable to contamination and need to be protected and understanding of groundwater resources needs to be improved.

Desired Future Condition

Increase protection in known highly vulnerable areas, improve understanding of groundwater resources, and increase educational opportunities to help public better understand their role in improving their drinking water resources.

Goal 1: Protect known highly vulnerable areas

Measurable outcome: Land use risk within highly vulnerable areas is reduced by 1370 acres through conversion to permanent protection or implementation of cover crops.

Table 7. Groundwater Protection Measurable Outcomes

Management Area	Cover Crops (acres)	Perennial Cover (acres)
Fountain Lake North	291	47
Fountain Lake South	44	9
Peter Lund Creek	247	42
Albert Lea Lake Lakeshed	14	2
Twin Lakes/Goose Creek	4	1
Shell Rock Outlet	268	45
Bear Lake	102	19
Winnebago Outlet	196	38
Total	**1167**	**203**

Measure: Number of acres converted to permanent protection or reduced risk land uses.

Frequency of measure: Biennial

Targeting implementation activities:

- Focus on areas identified by MDA's new nitrogen fertilizer rule
- Drinking water supply management area (DWSMA) vulnerability is moderate or high; or
- Pollution sensitivity to wells is high; or
- Pollution sensitivity to near surface materials is high; or

SHELL ROCK - WINNEBAGO RIVER CWMP ISSUE STATEMENT FRAMEWORK

- Karst regions; or
- Well testing show ≥ 5 mg/L nitrate

Goal 2. Enhance and collaborate with existing wellhead protection planning efforts

Measurable outcome: Provide support in MDH's efforts to establish additional wellhead protection areas.

Measure:

- Participation in the number of wellhead protection plans being developed or implemented
- Number of wellhead protection plan activities implemented

Frequency of measure: Biennial

Targeting implementation activities:

- Target communities located in areas with high pollution sensitivity in near surface materials.

Goal 3: Increase understanding of groundwater resources and human influences

Measurable outcome: Develop a County Geologic Atlas for Freeborn County and increase public awareness of human influences on groundwater quality.

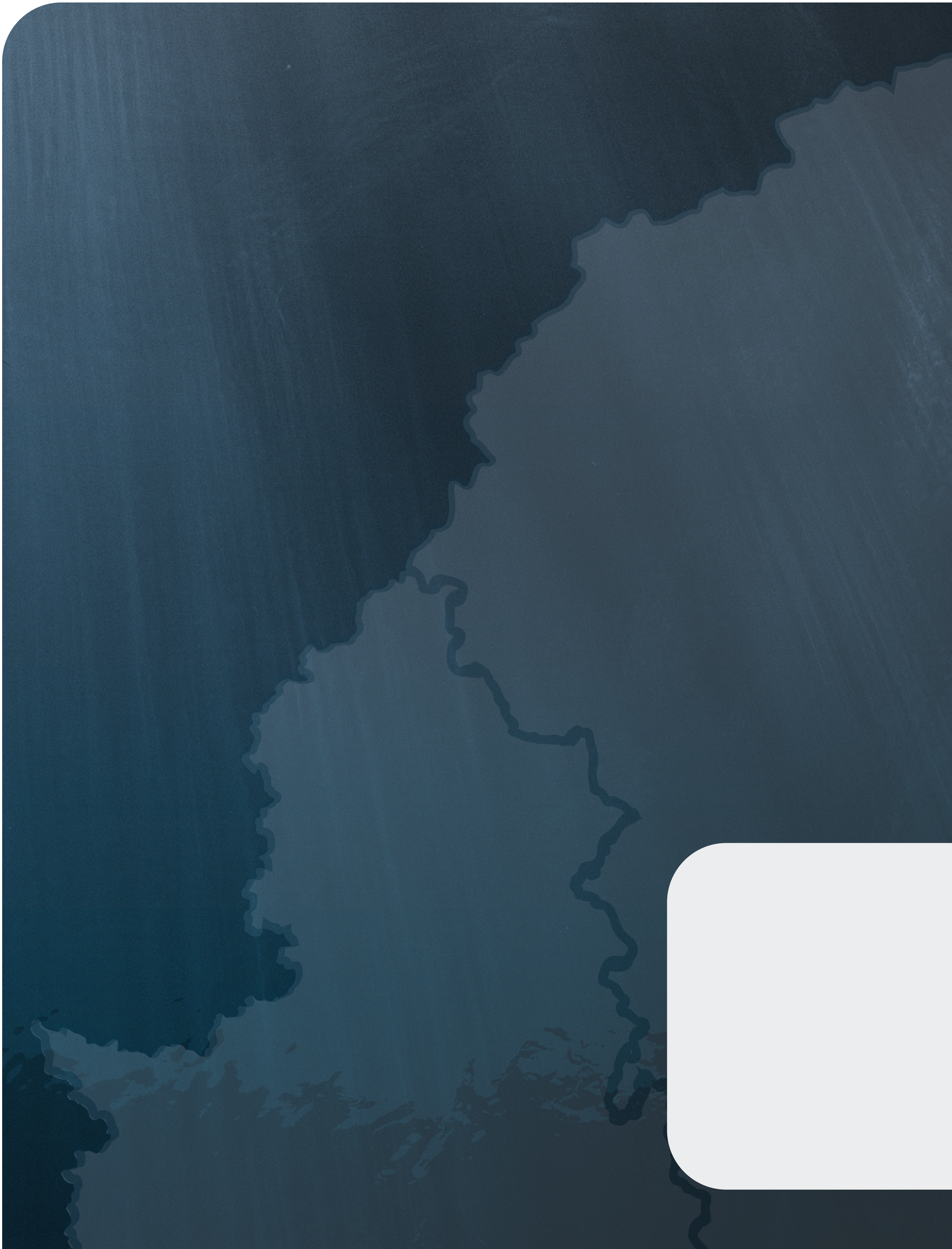
Measure:

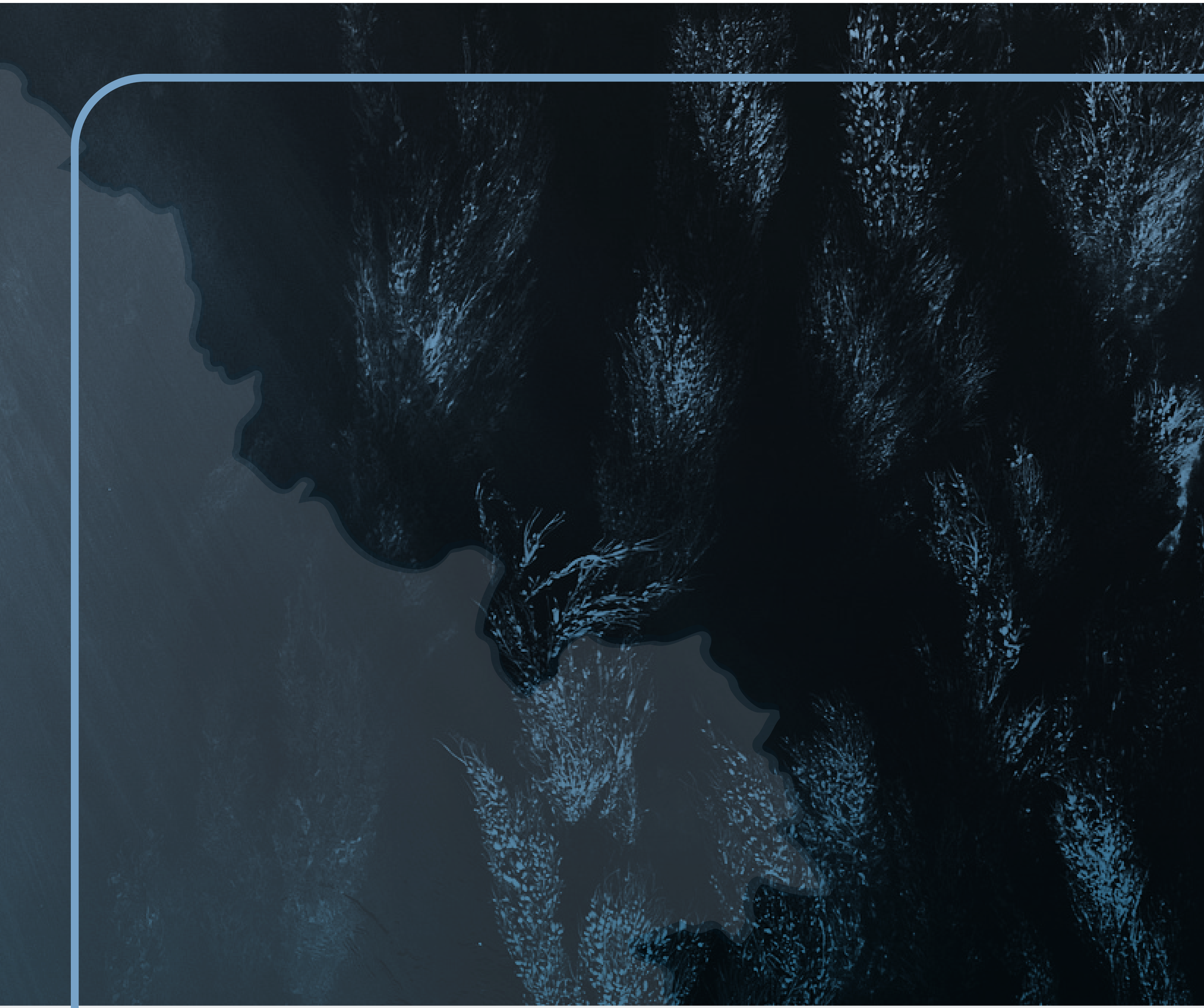
- Develop County Geologic Atlas
- Develop County Groundwater Atlas
- Conduct X number of outreach and educational events on Contaminants of Emerging Concern (CEC)
- Conduct X number of outreach and educational events educating landowners of new nitrogen fertilizer restrictions.

Frequency of measure: Biennial

Targeting implementation activities:

Timing will be held off until January for approval process at County.





APPENDIX E
IMPLEMENTATION TARGETING MAPS

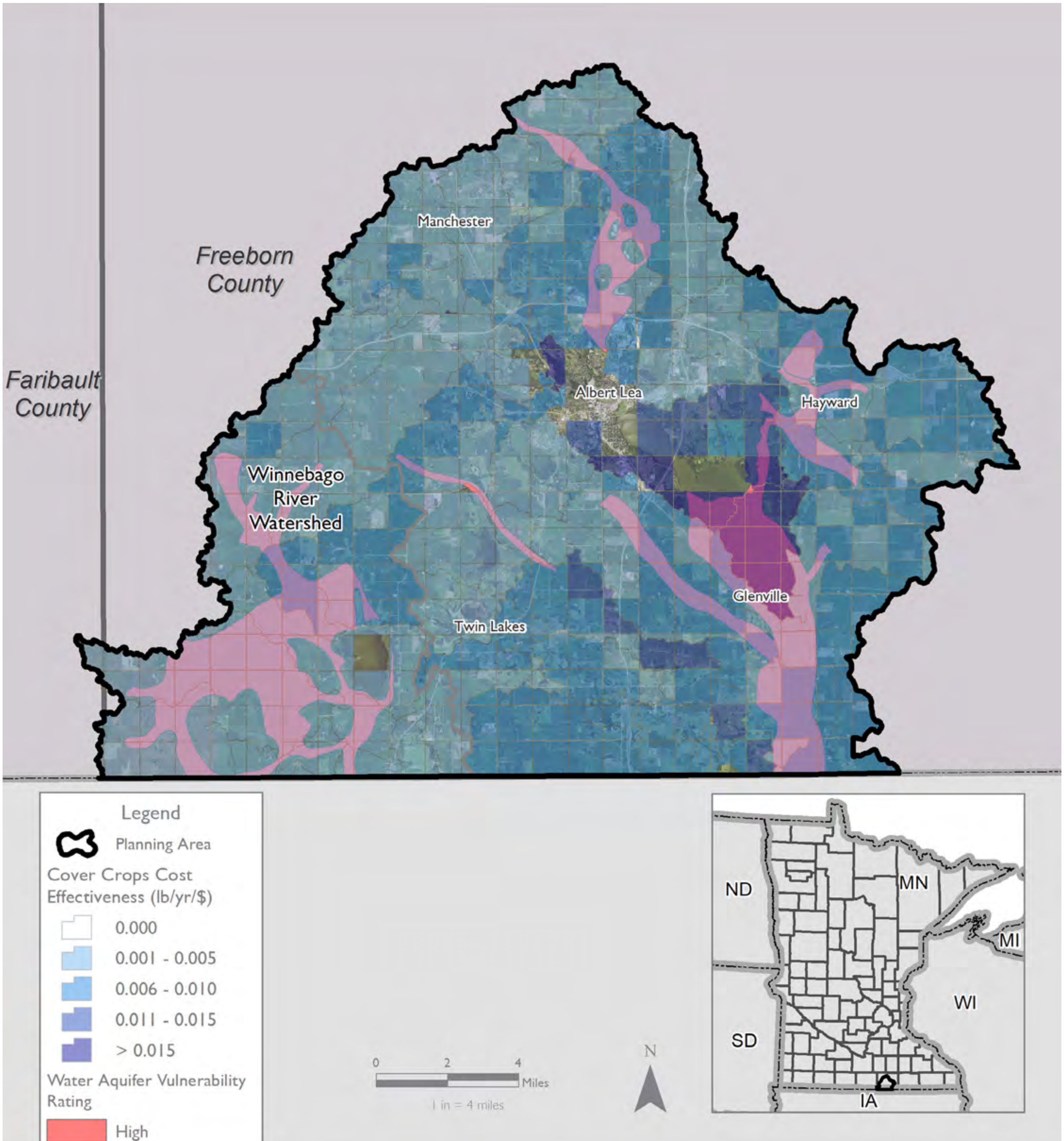


Figure E.1: Planning Area: Cover Crops Cost Effectiveness with Aquifer Vulnerability

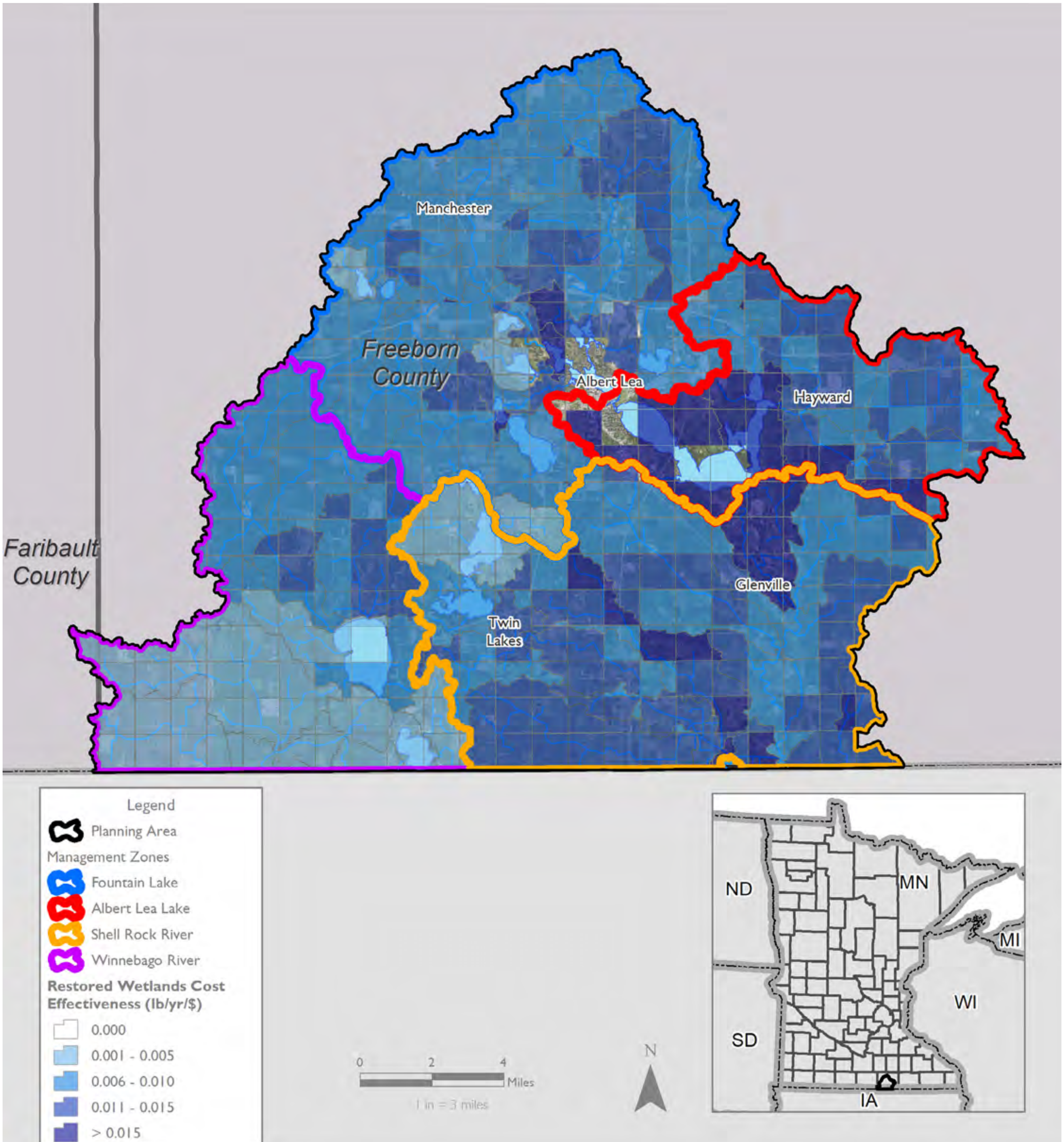


Figure E.2: Planning Area: Restored Wetland Cost Effectiveness

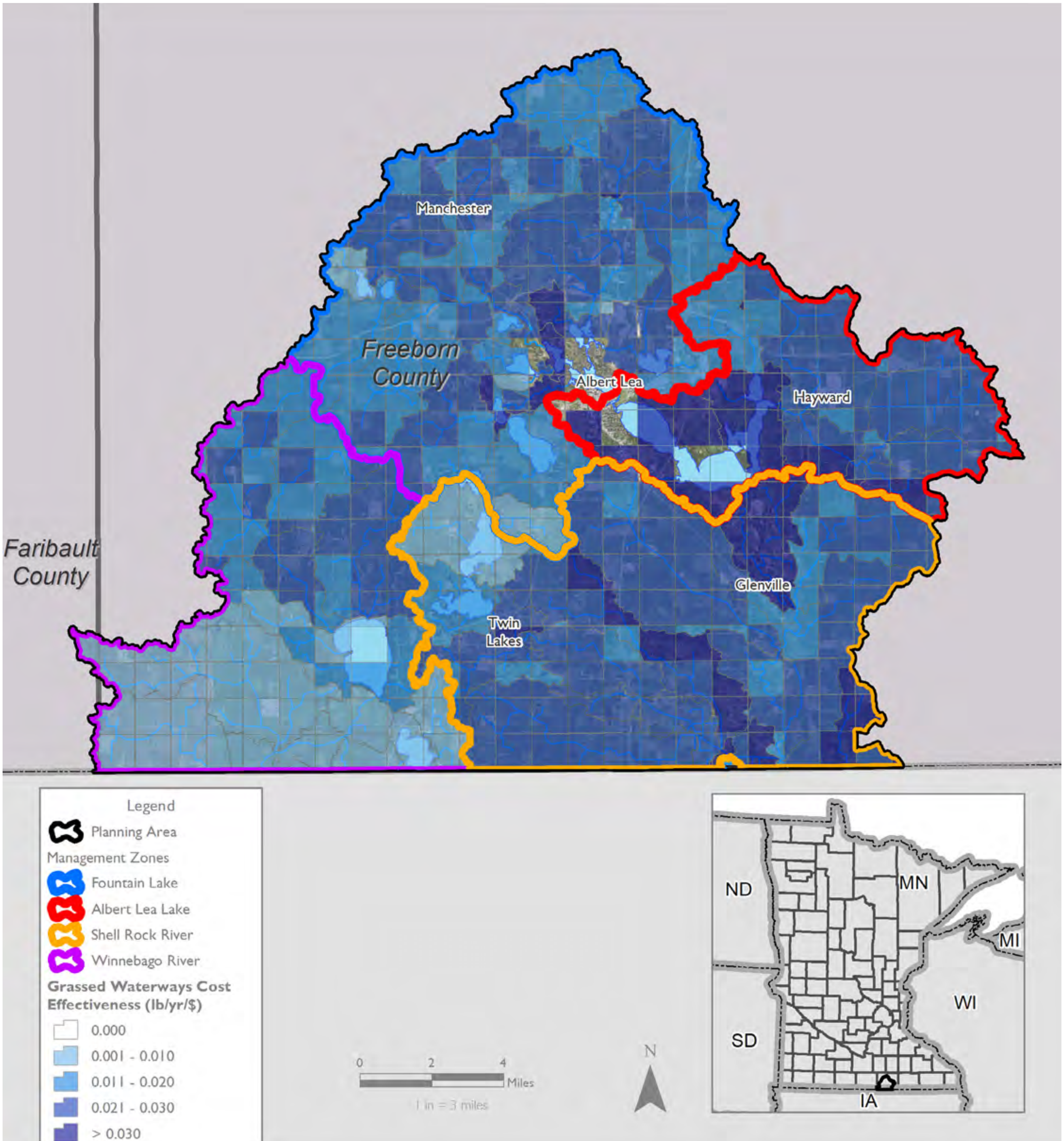


Figure E.3: Planning Area: Grassed Waterway Cost Effectiveness

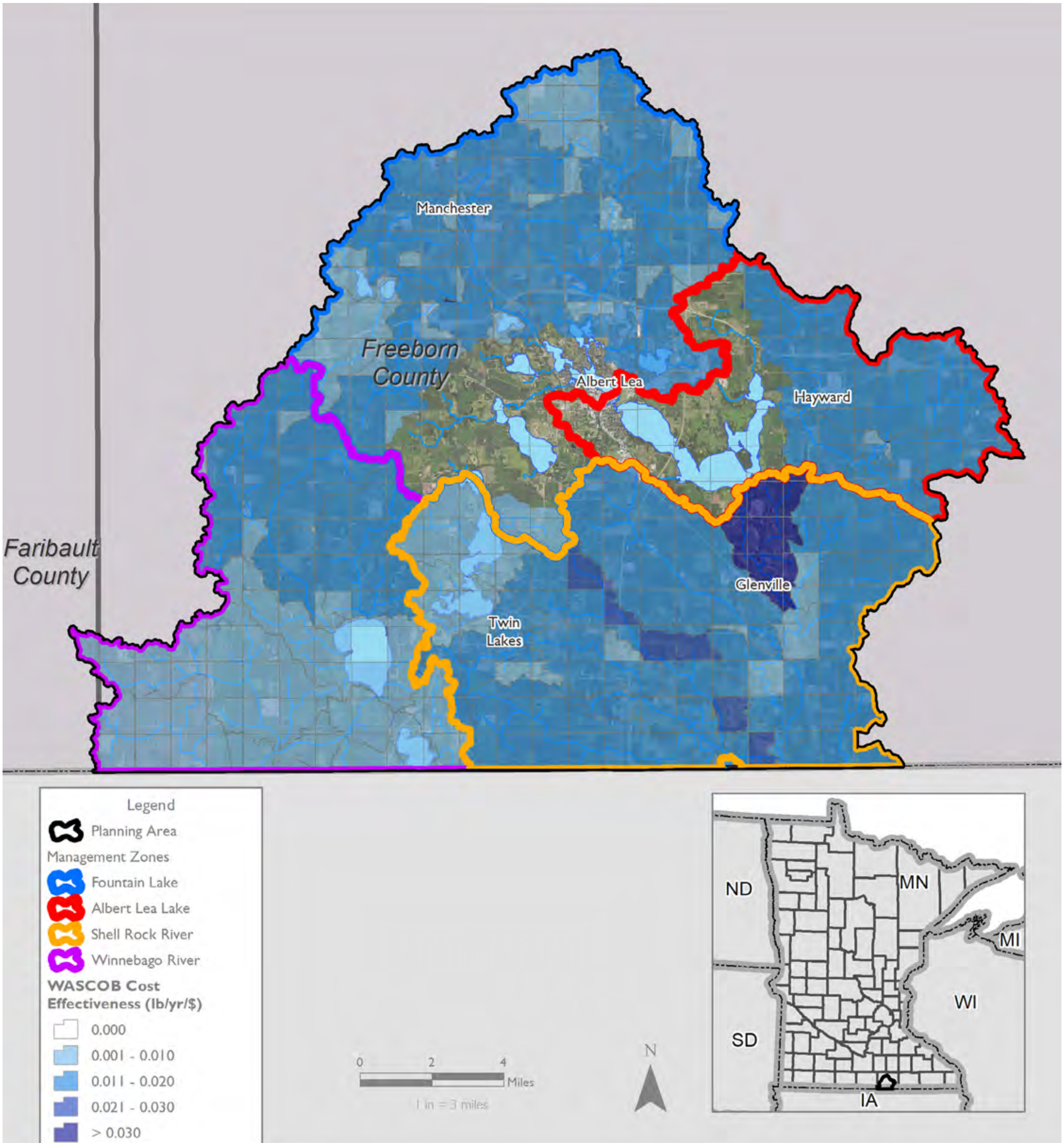


Figure E.4: Planning Area: WASCOB Cost Effectiveness

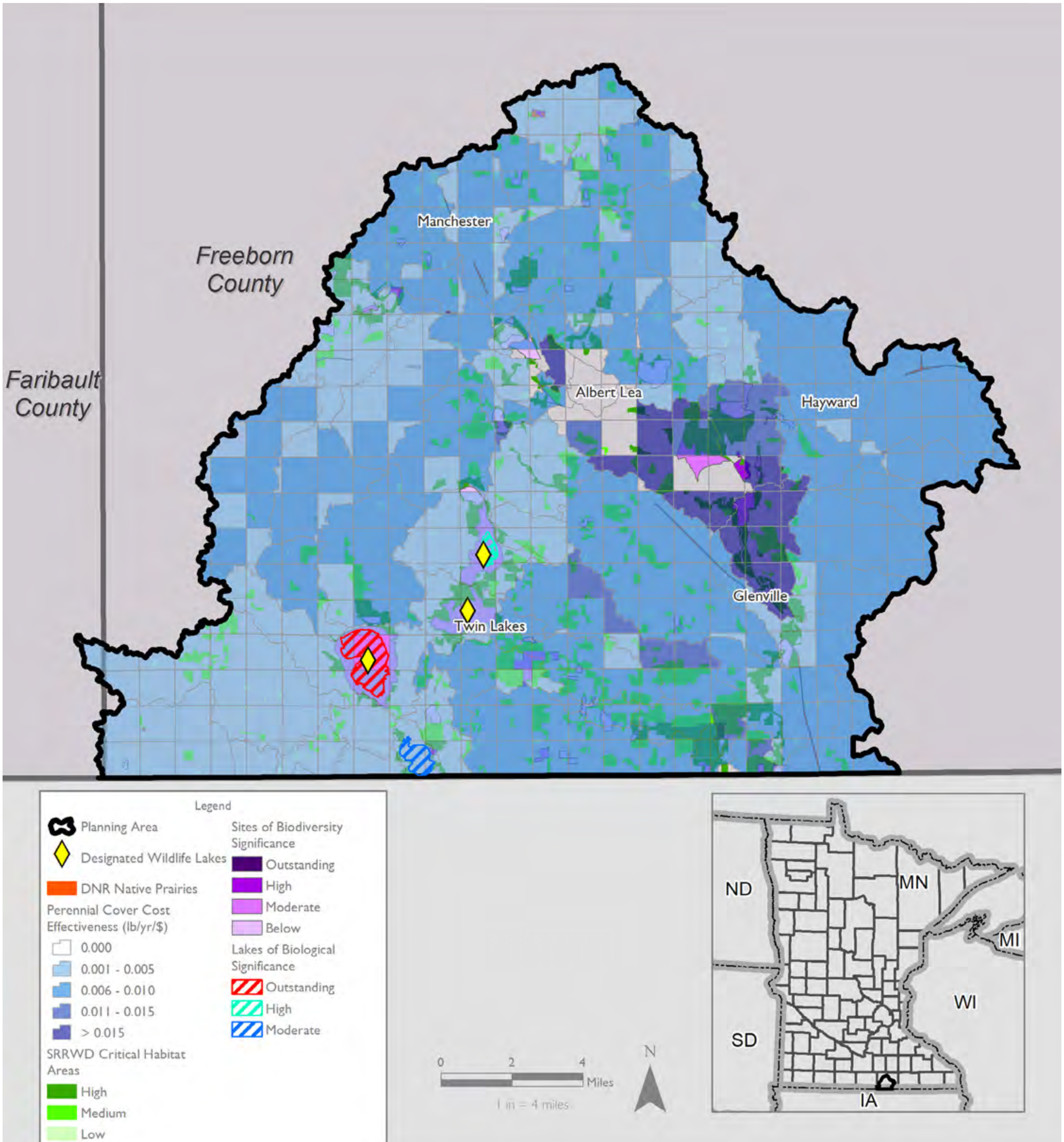


Figure E.5: Planning Area: Perennial Cover Cost Effectiveness with Critical Habitat

BANCROFT CREEK IMPLEMENTATION TARGETING MAPS

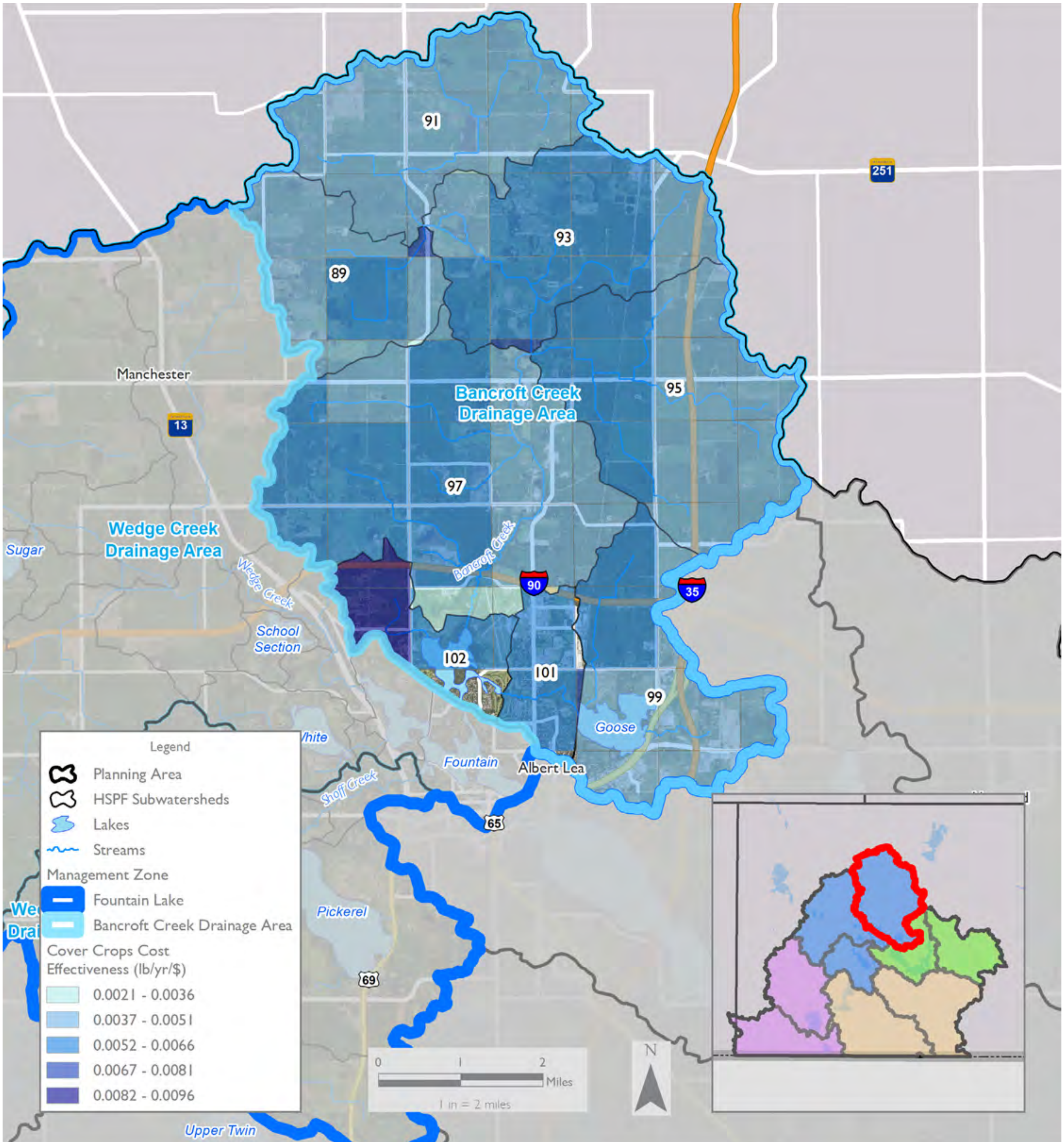


Figure E.6: Bancroft Creek: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

Shell Rock River and Winnebago River Comprehensive Watershed Management Plan Page E6

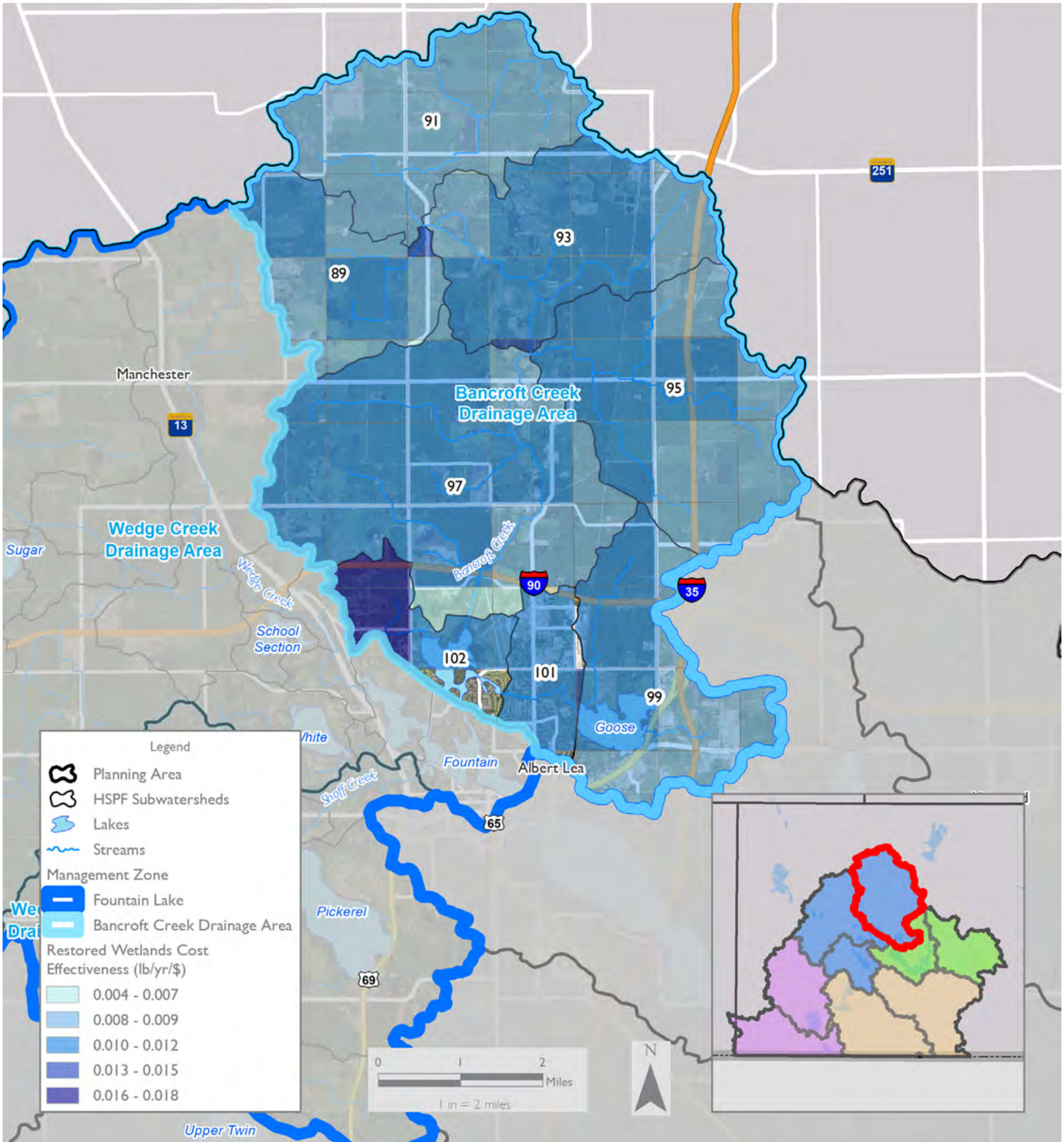


Figure E.7: Bancroft Creek: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

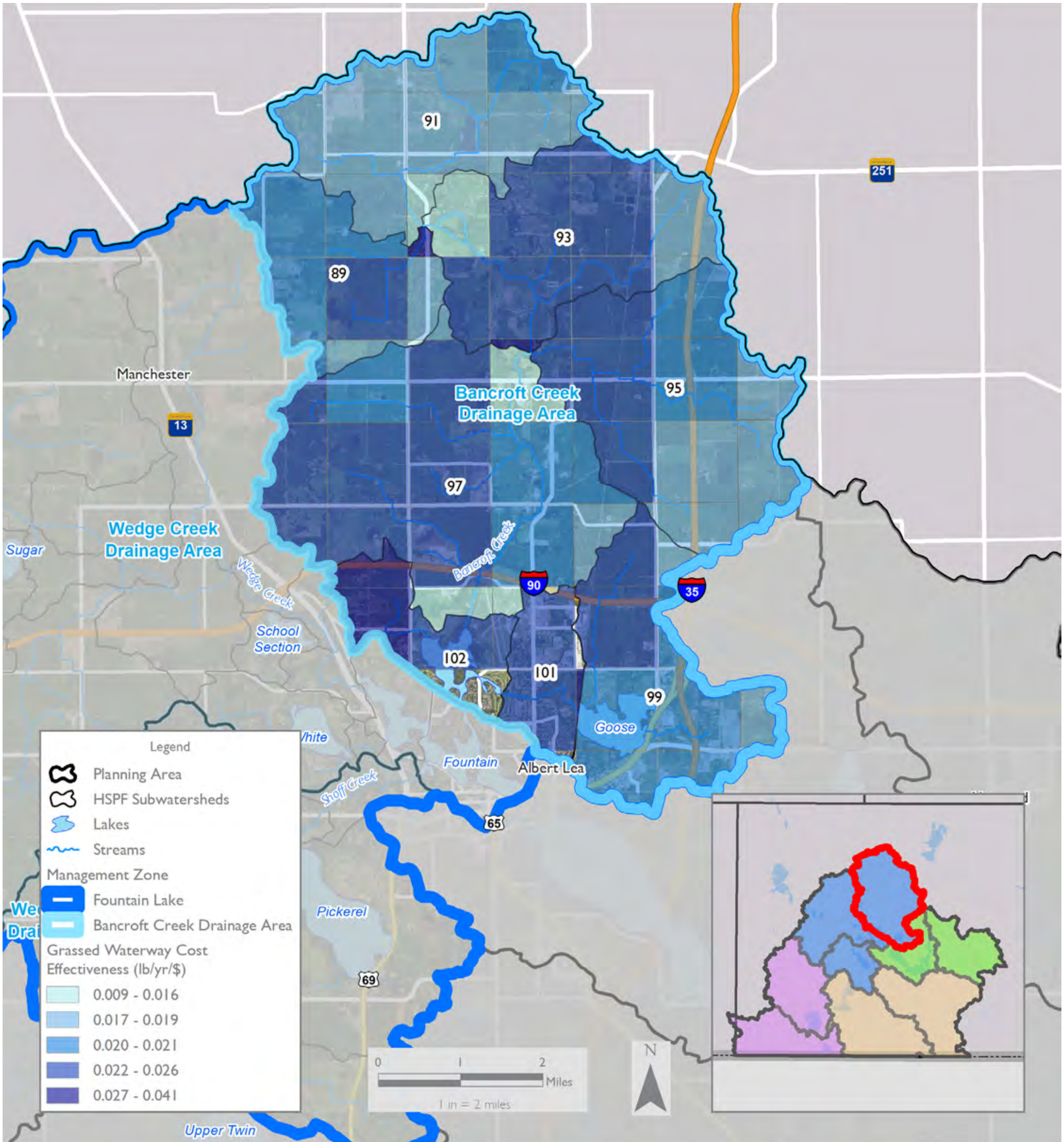


Figure E.8: Bancroft Creek: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

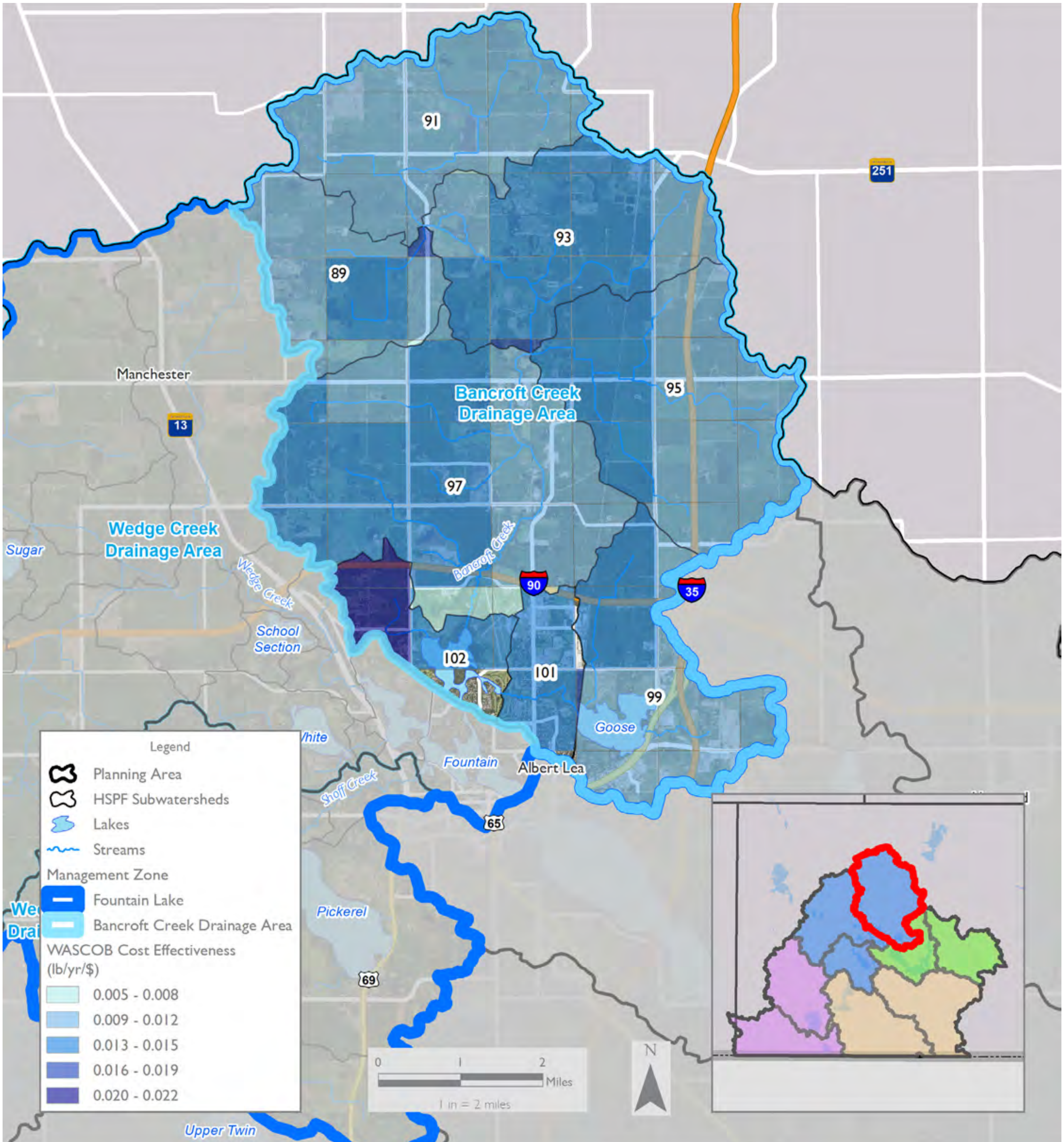


Figure E.9: Bancroft Creek: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

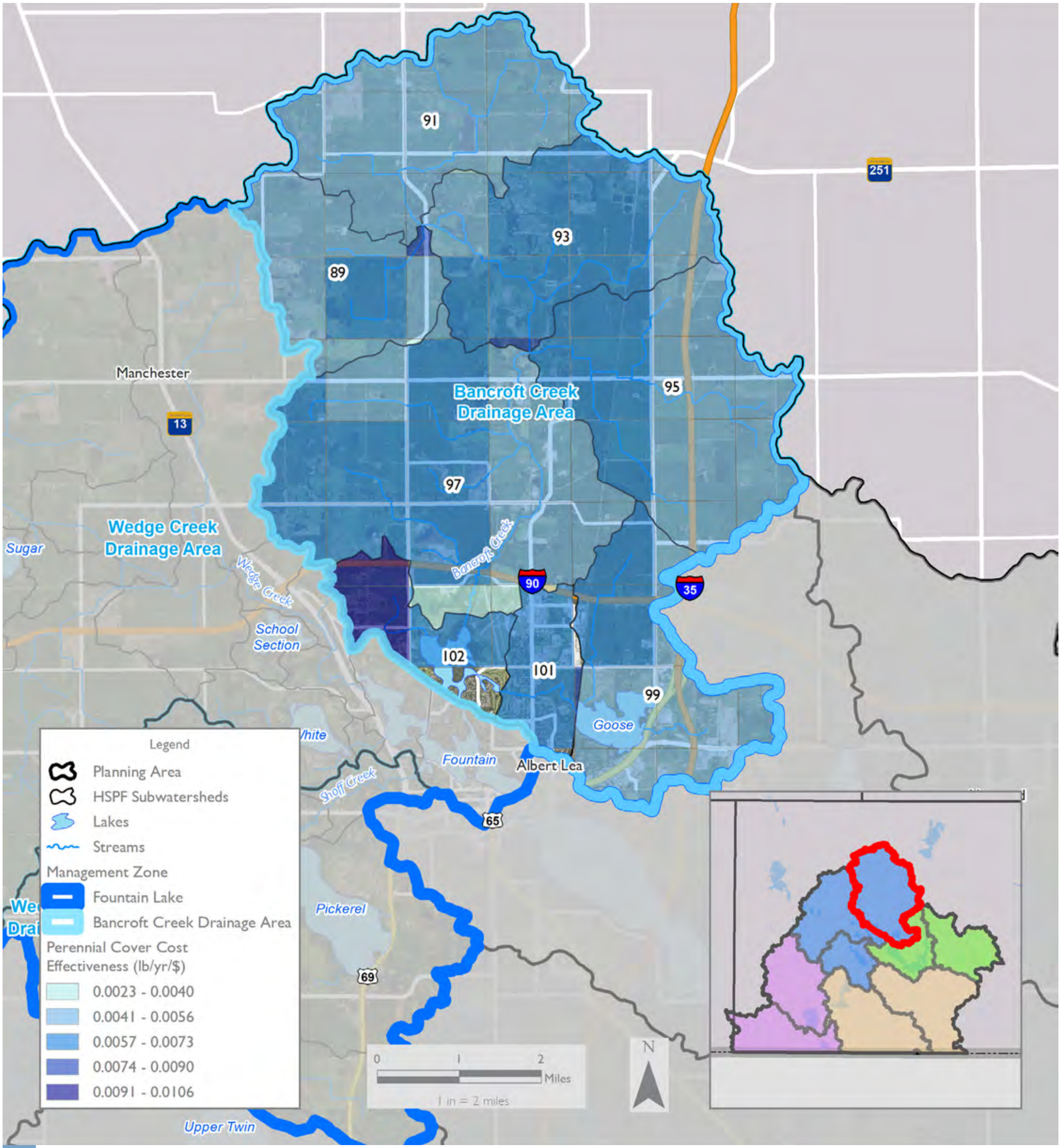


Figure E.10: Bancroft Creek: Perennial Implementation Targeting Areas for Treating Total Phosphorus

WEDGE CREEK IMPLEMENTATION TARGETING MAPS

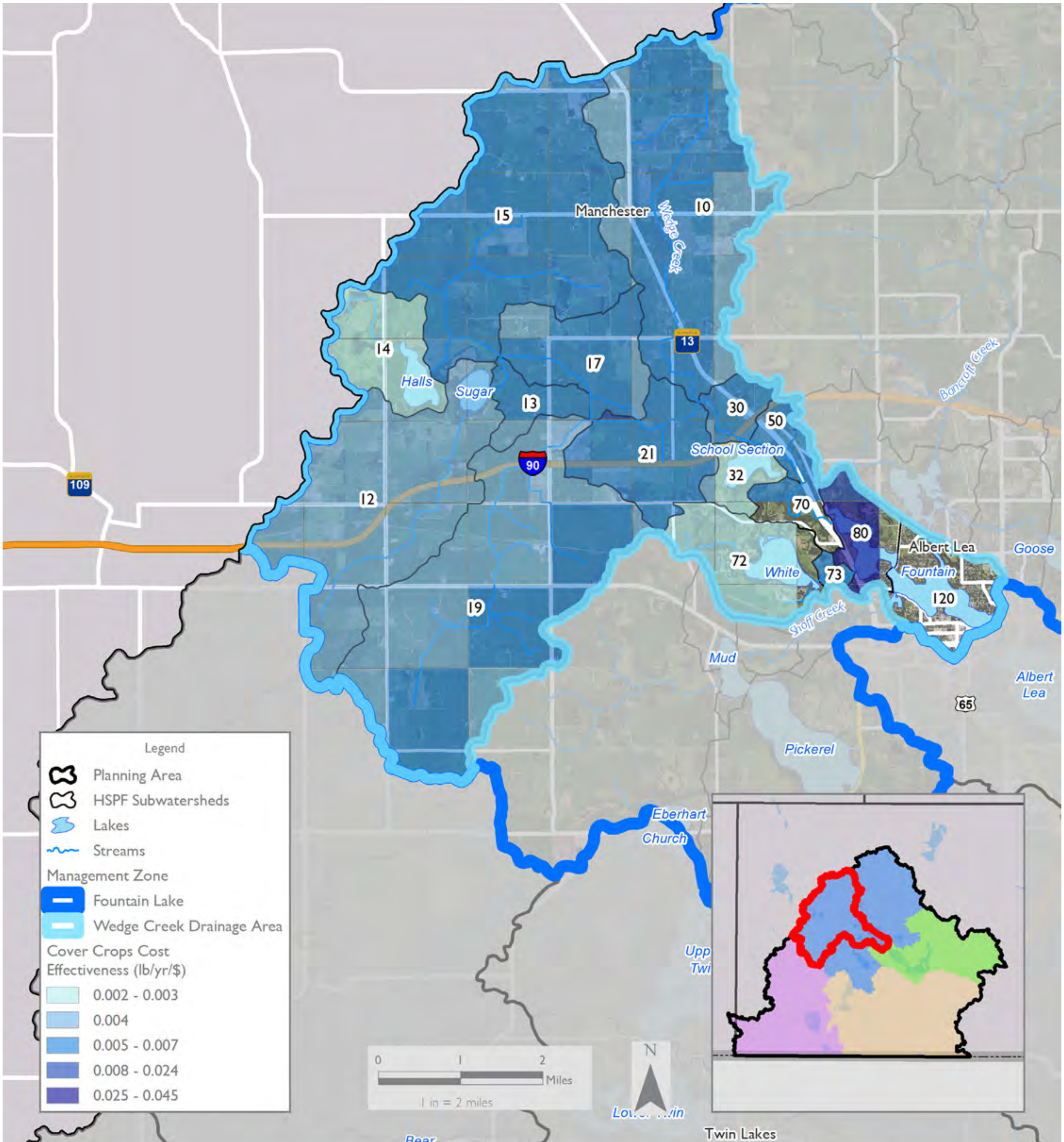


Figure E.11: Wedge Creek: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

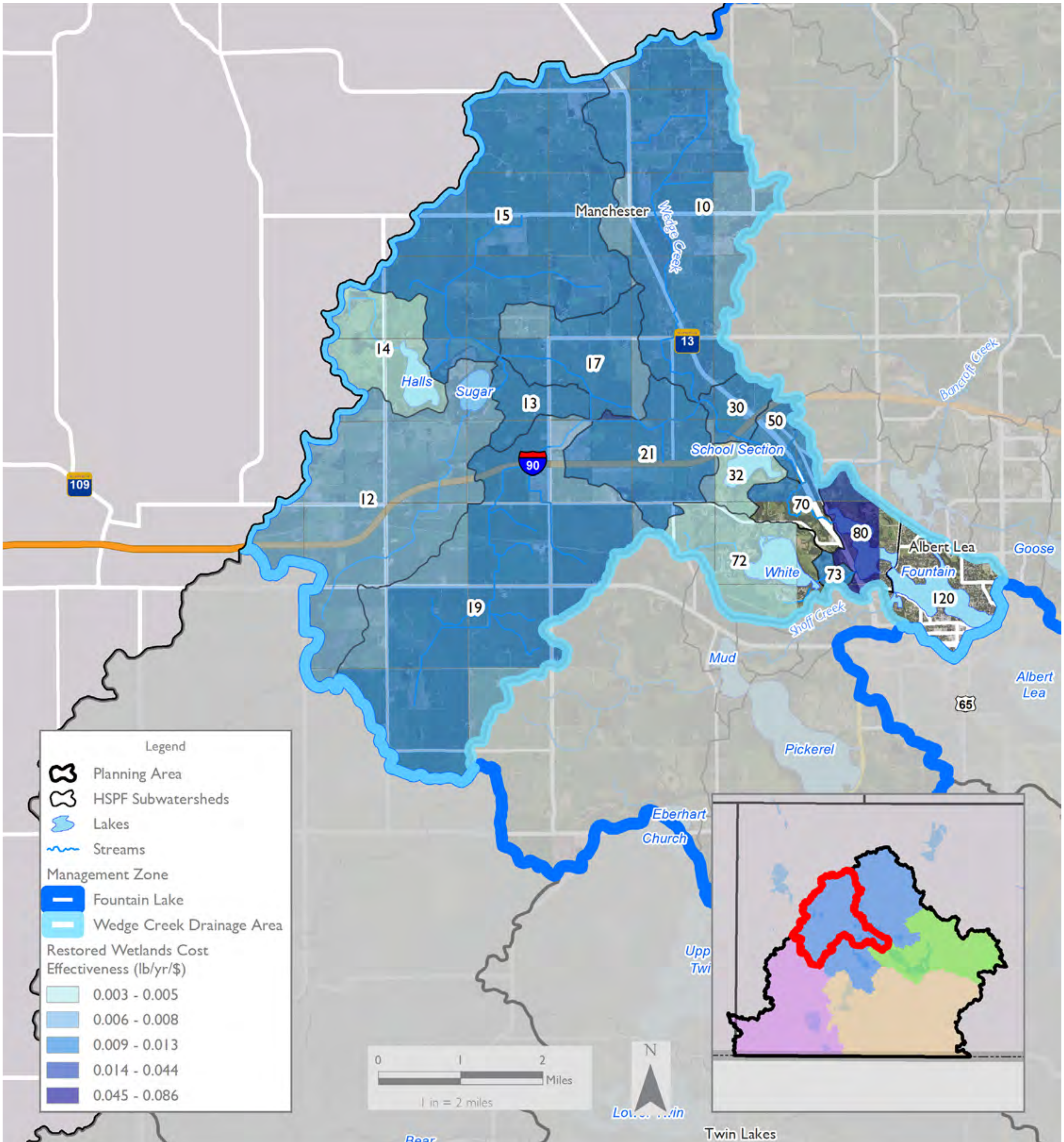


Figure E.12: Wedge Creek: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

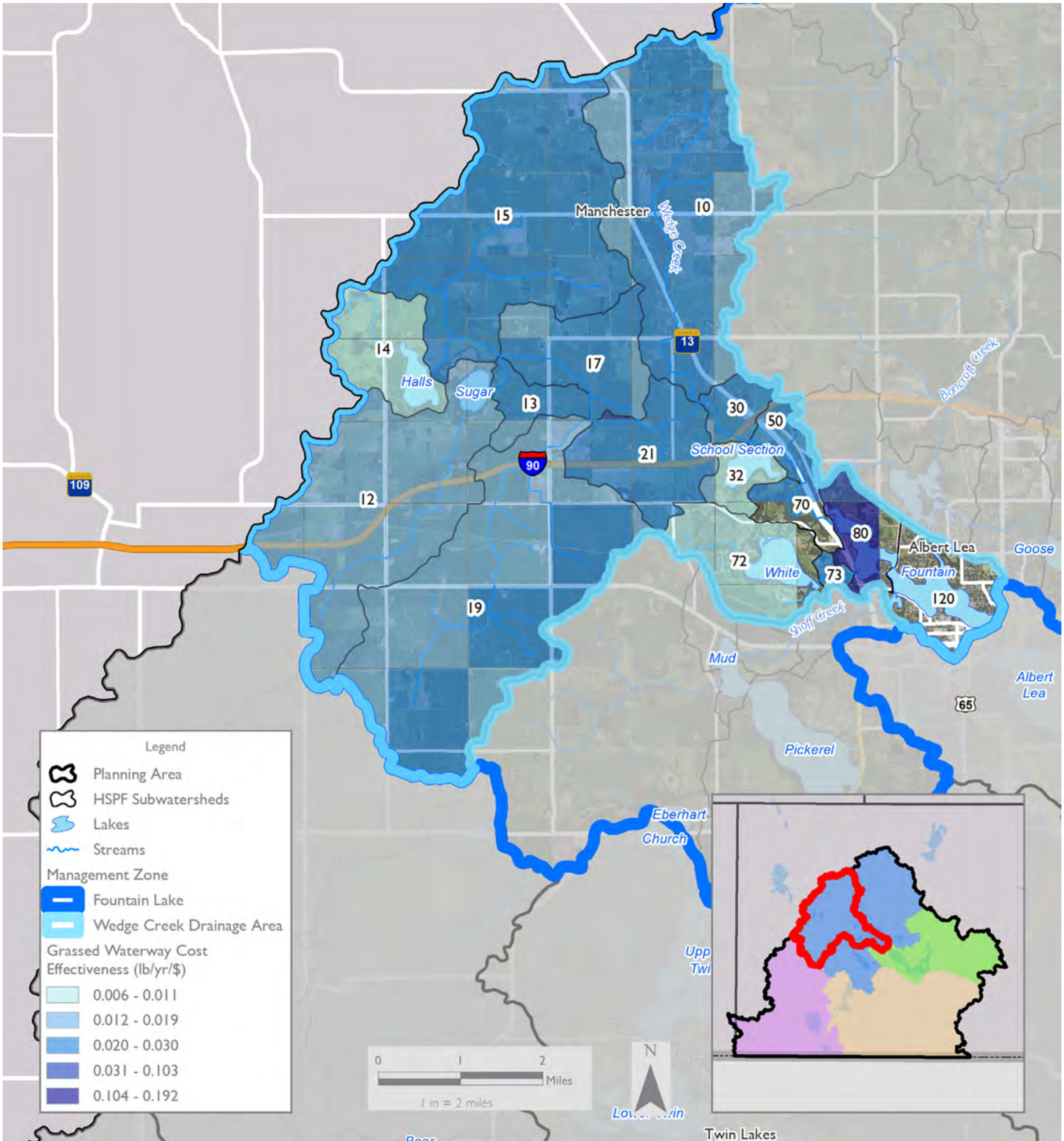


Figure E.13: Wedge Creek: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

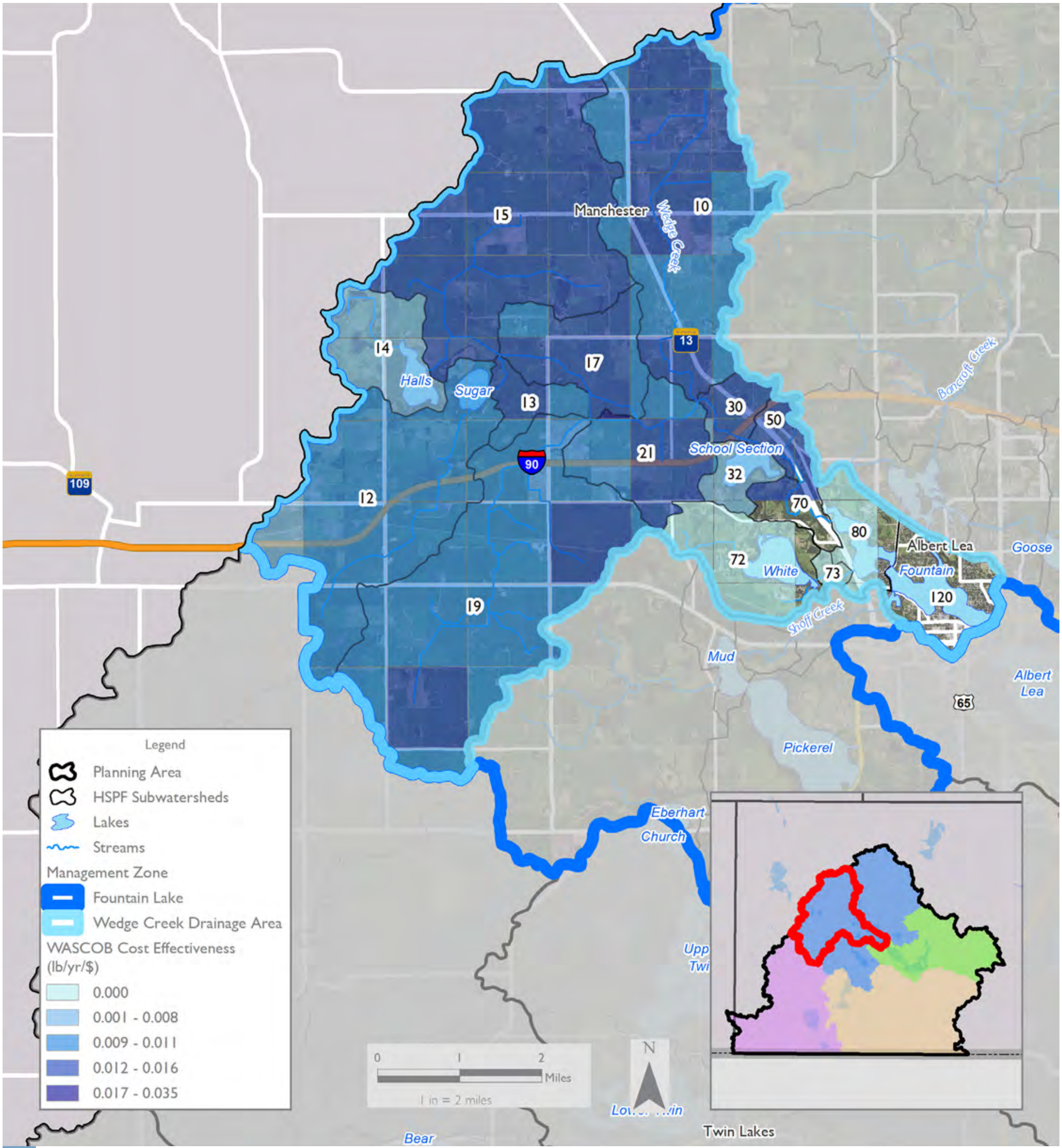


Figure E.14: Wedge Creek: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

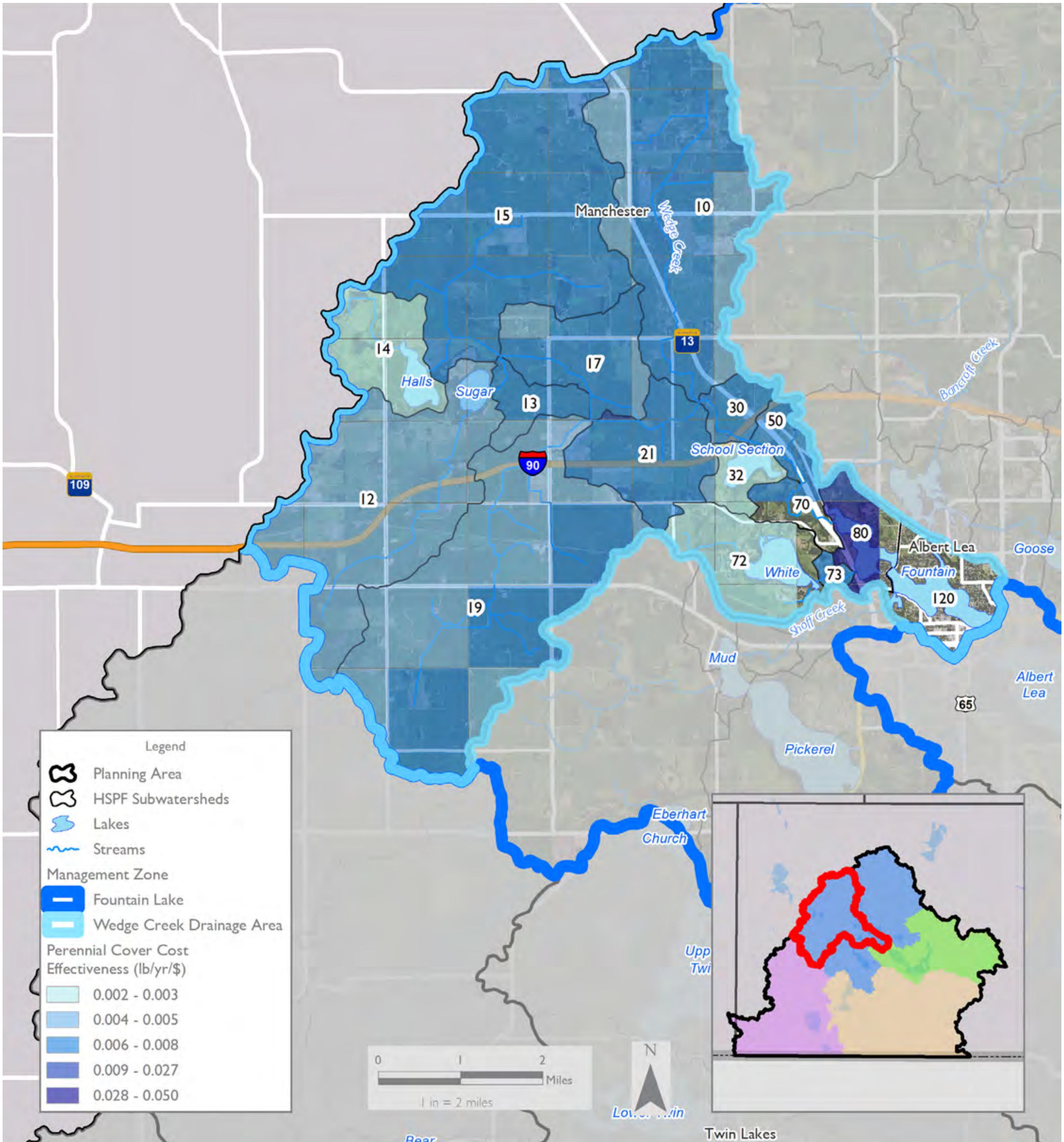


Figure E.15: Wedge Creek: Perennial Implementation Targeting Areas for Treating Total Phosphorus

SHOFF CREEK IMPLEMENTATION TARGETING MAPS

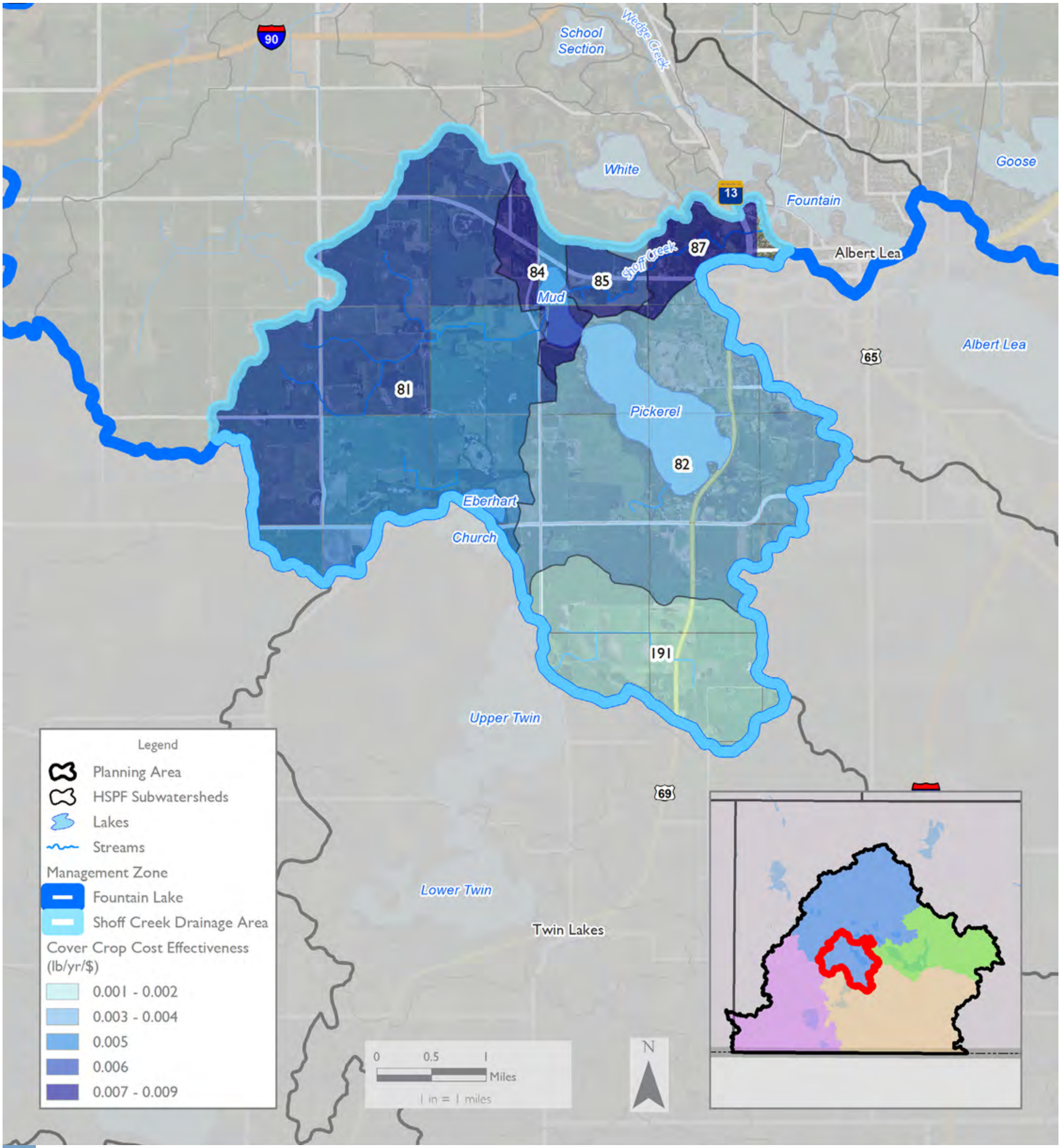


Figure E.16: Shoff Creek: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

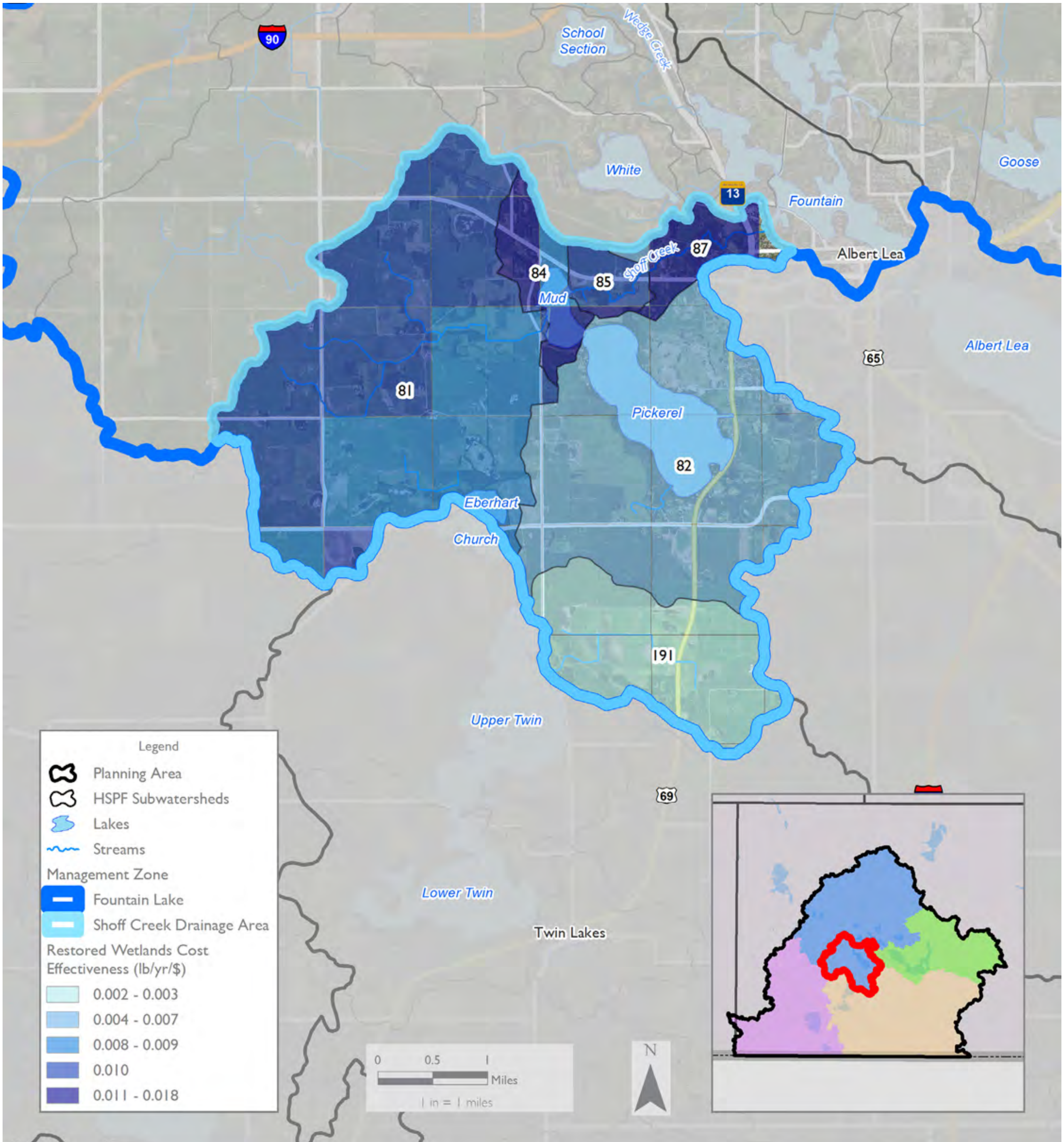


Figure E.17: Shoff Creek: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

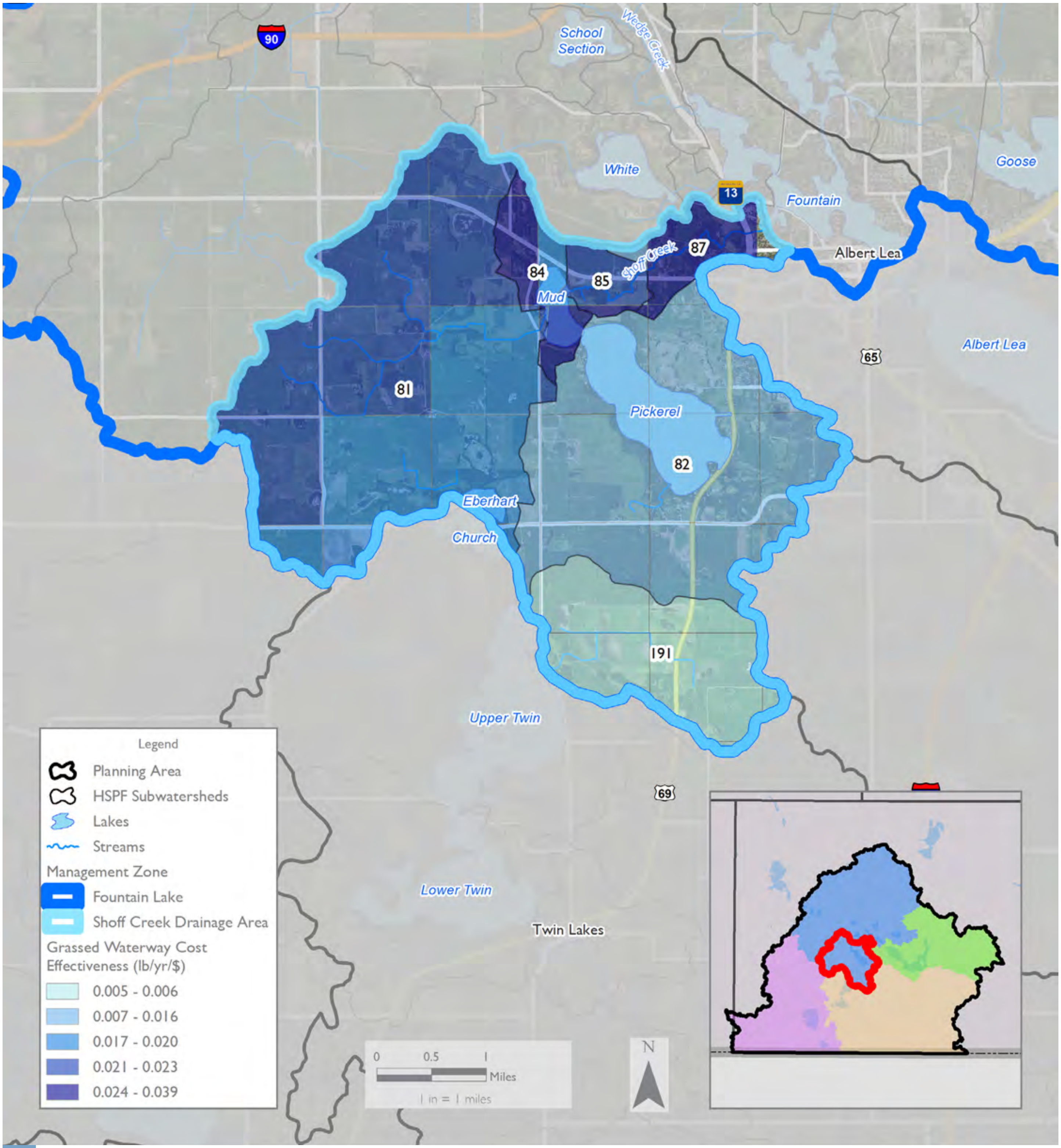


Figure E.18: Shoff Creek: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

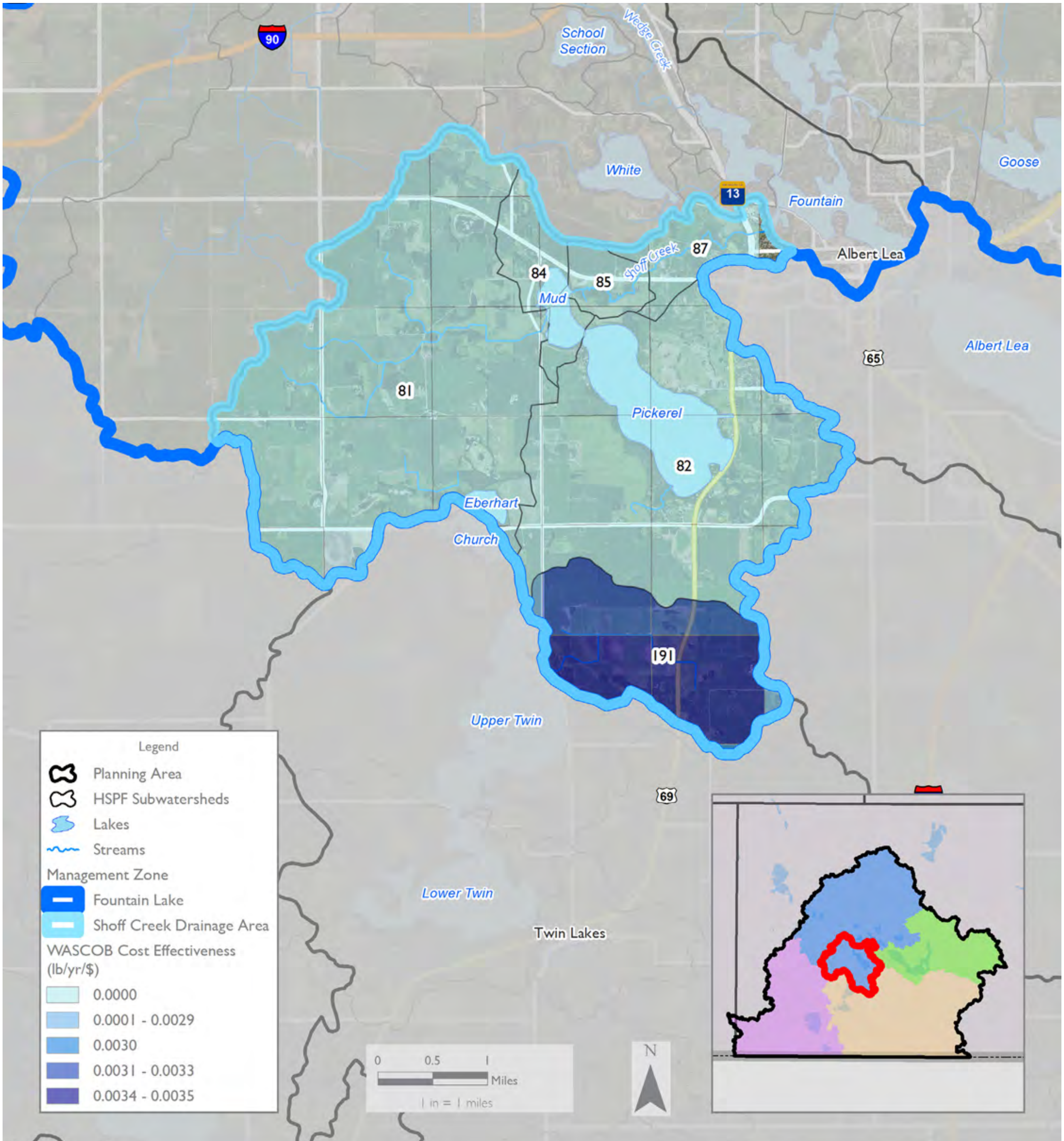


Figure E.19: Shoff Creek: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

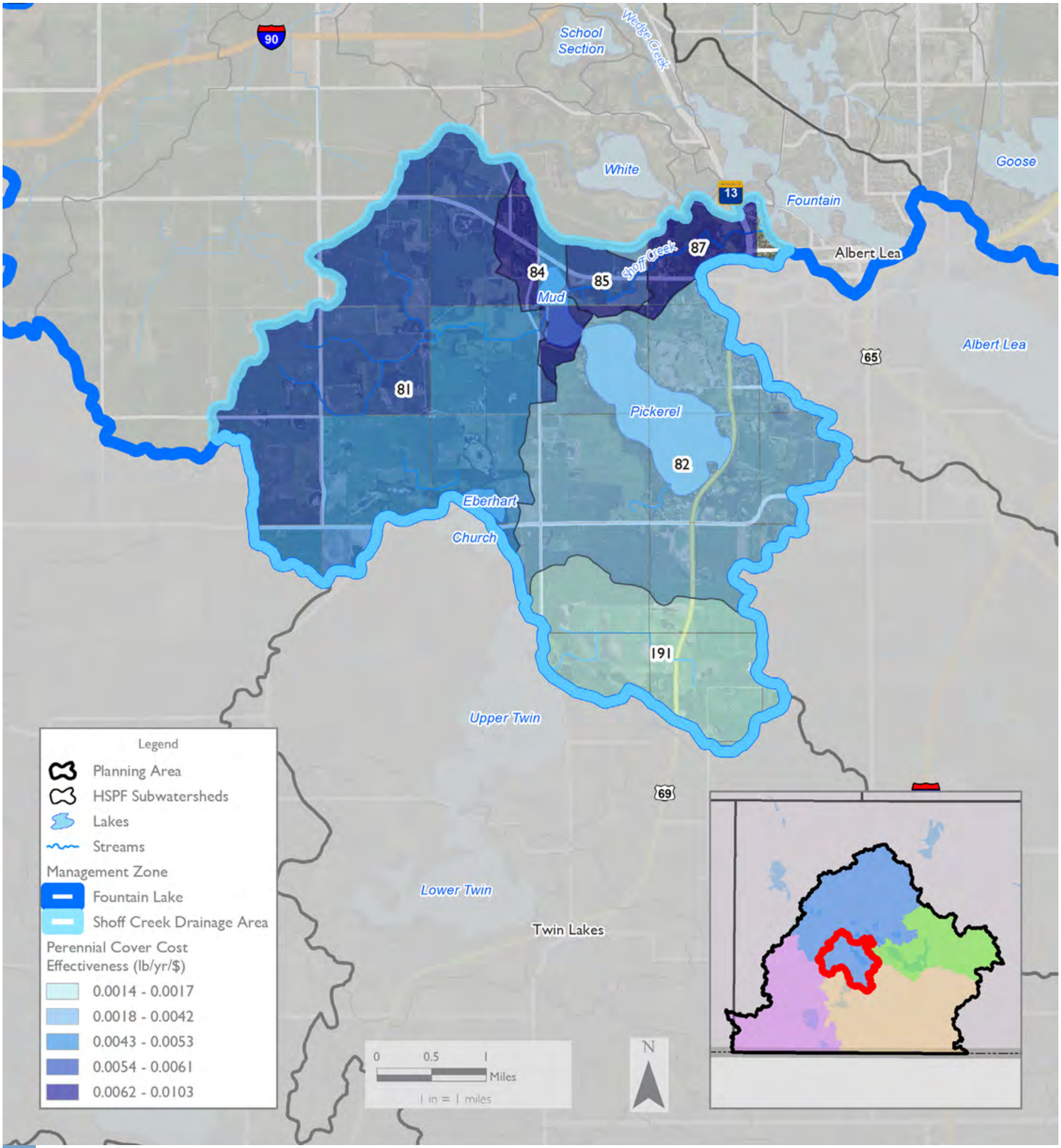


Figure E.20: Shoff Creek: Perennial Implementation Targeting Areas for Treating Total Phosphorus

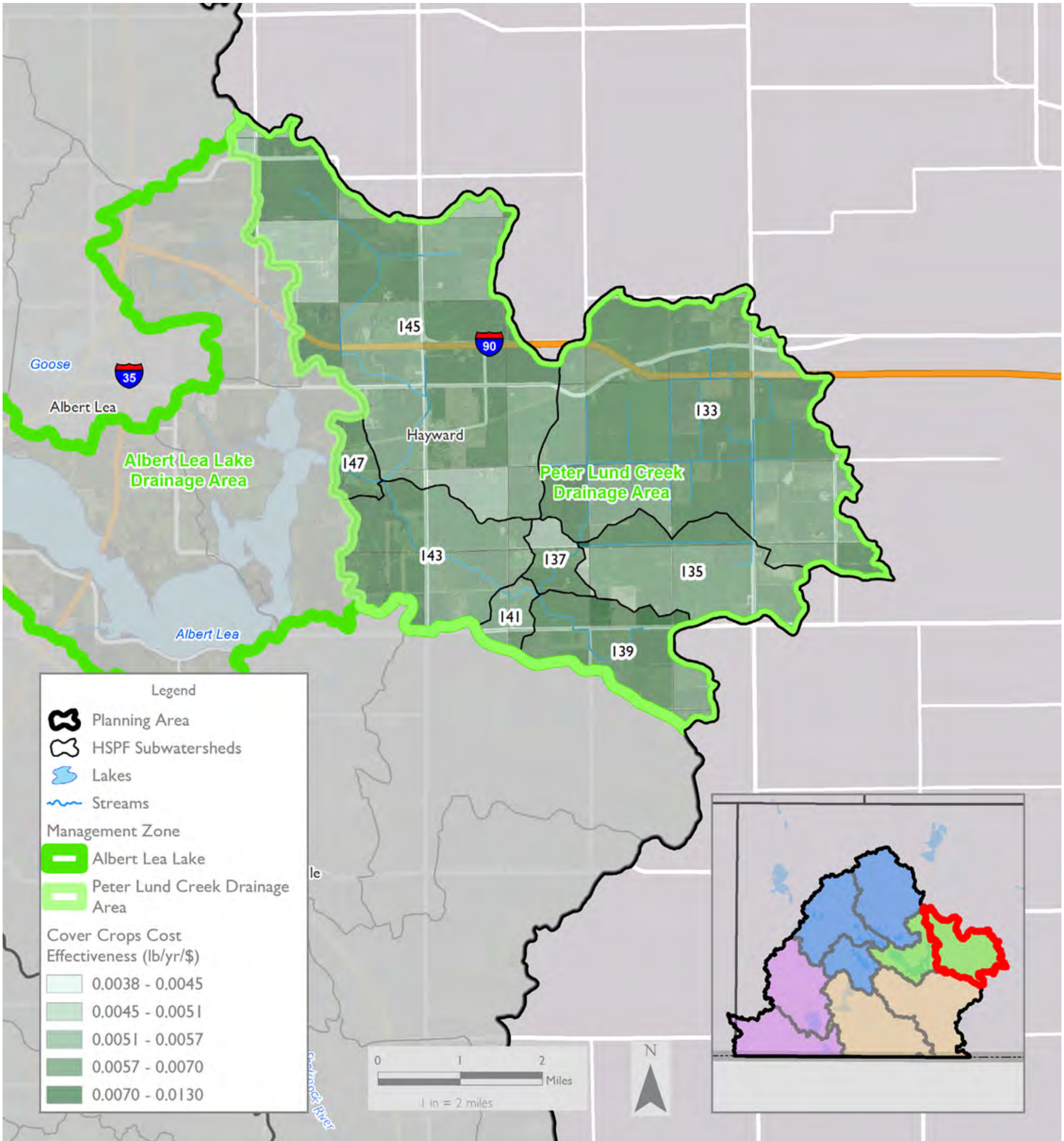


Figure E.21: Peter Lund Creek: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

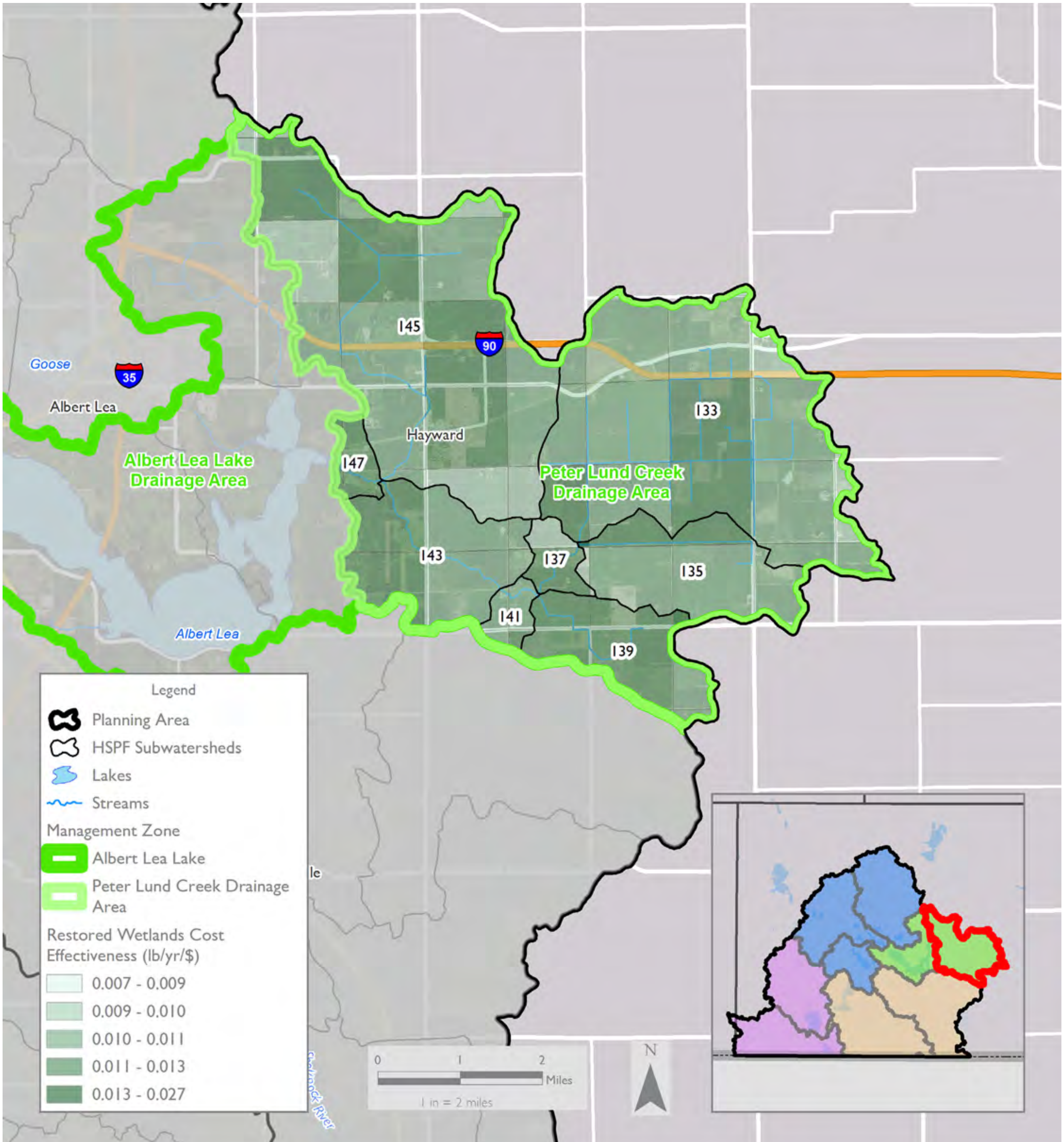


Figure E.22: Peter Lund Creek: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

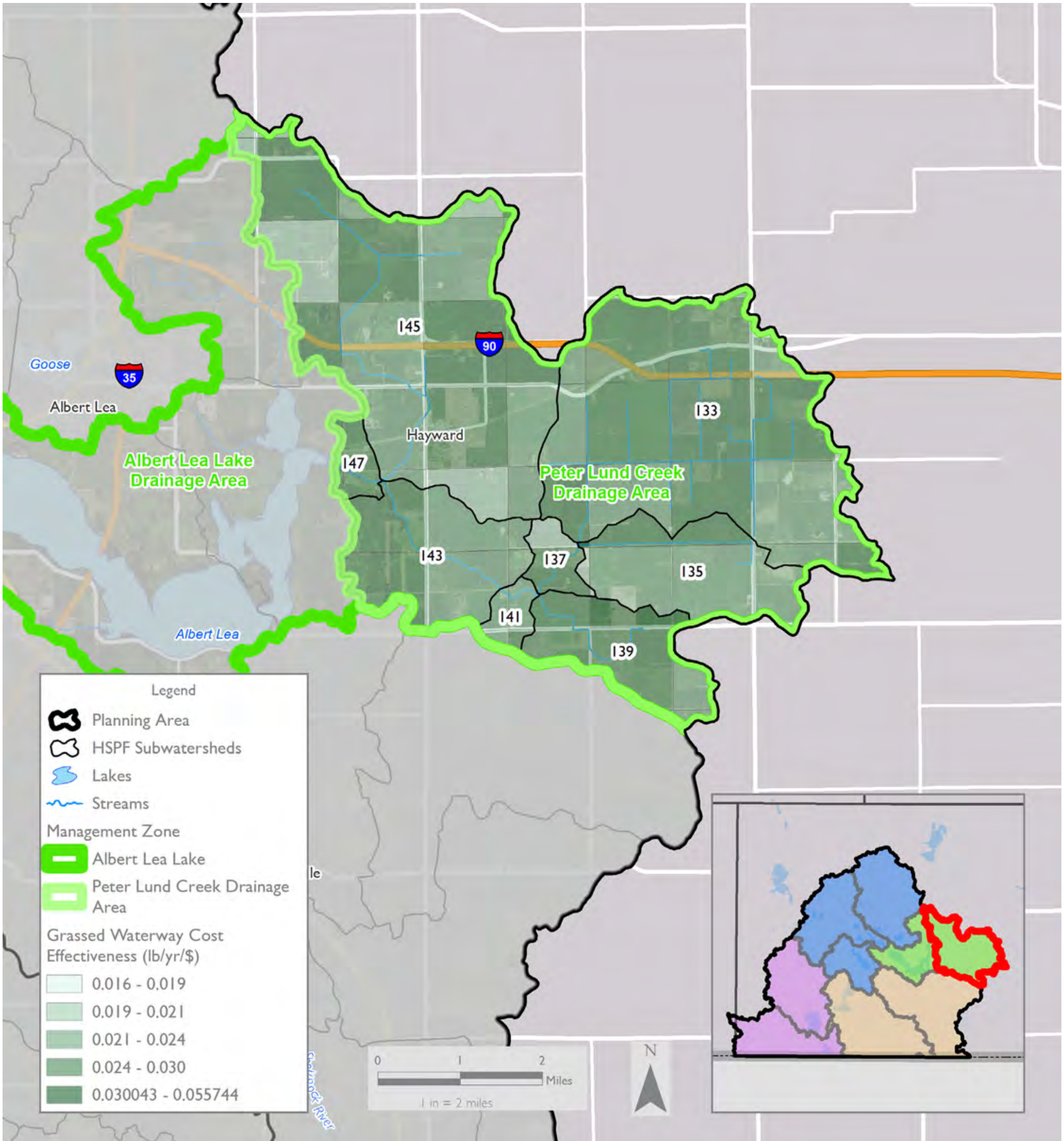


Figure E.23: Peter Lund Creek: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

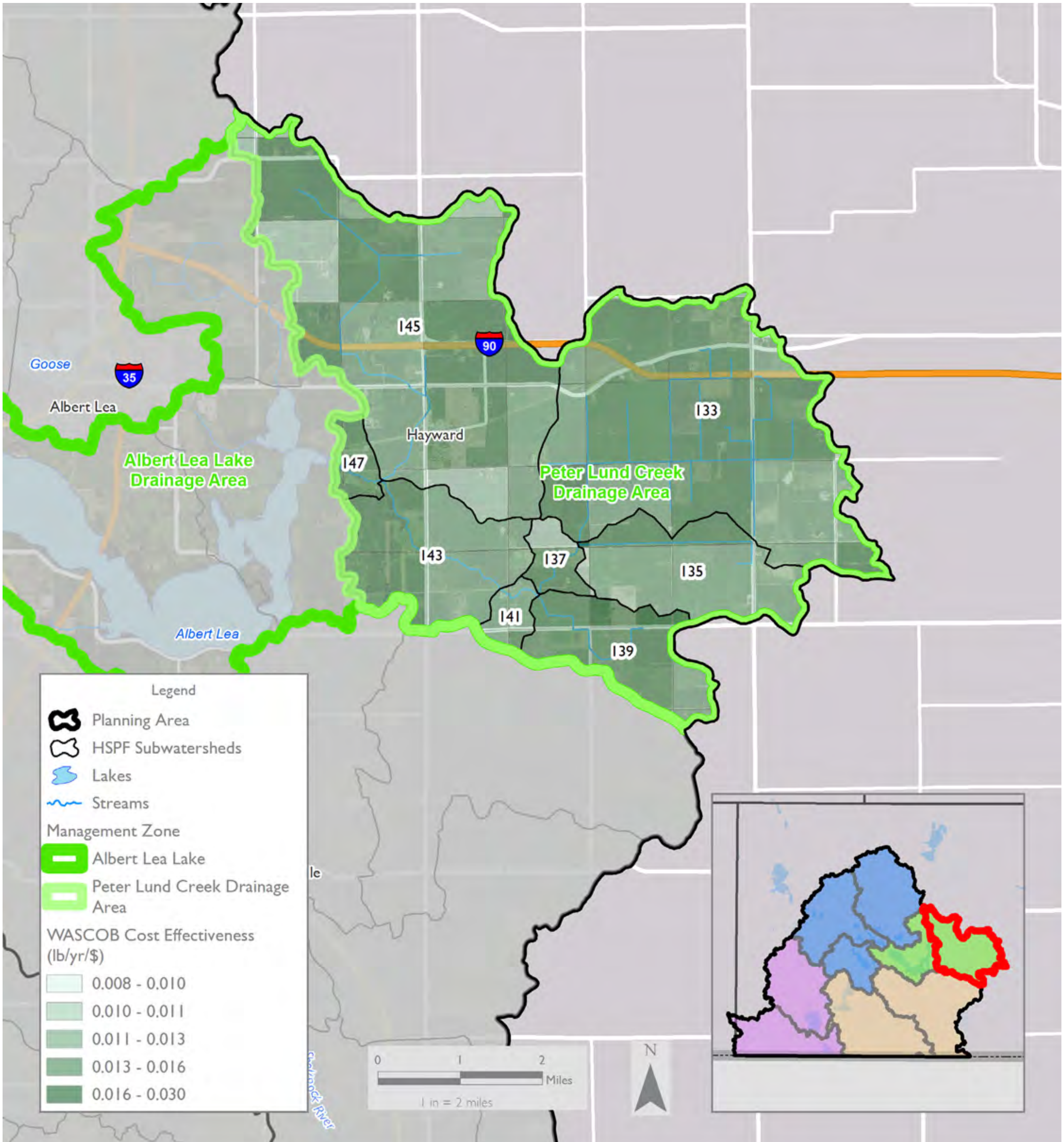


Figure E.24: Peter Lund Creek: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

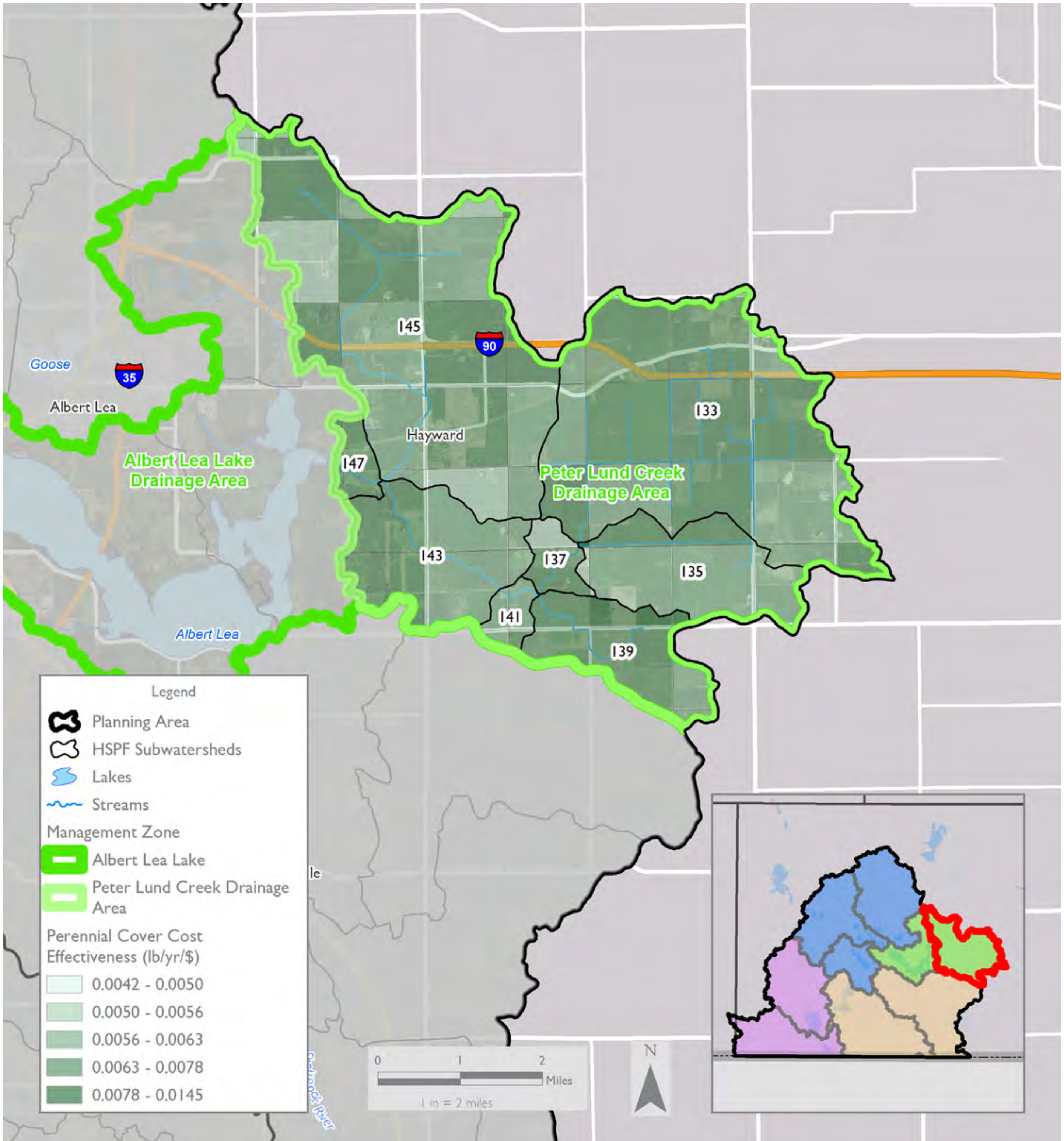


Figure E.25: Peter Lund Creek: Perennial Implementation Targeting Areas for Treating Total Phosphorus

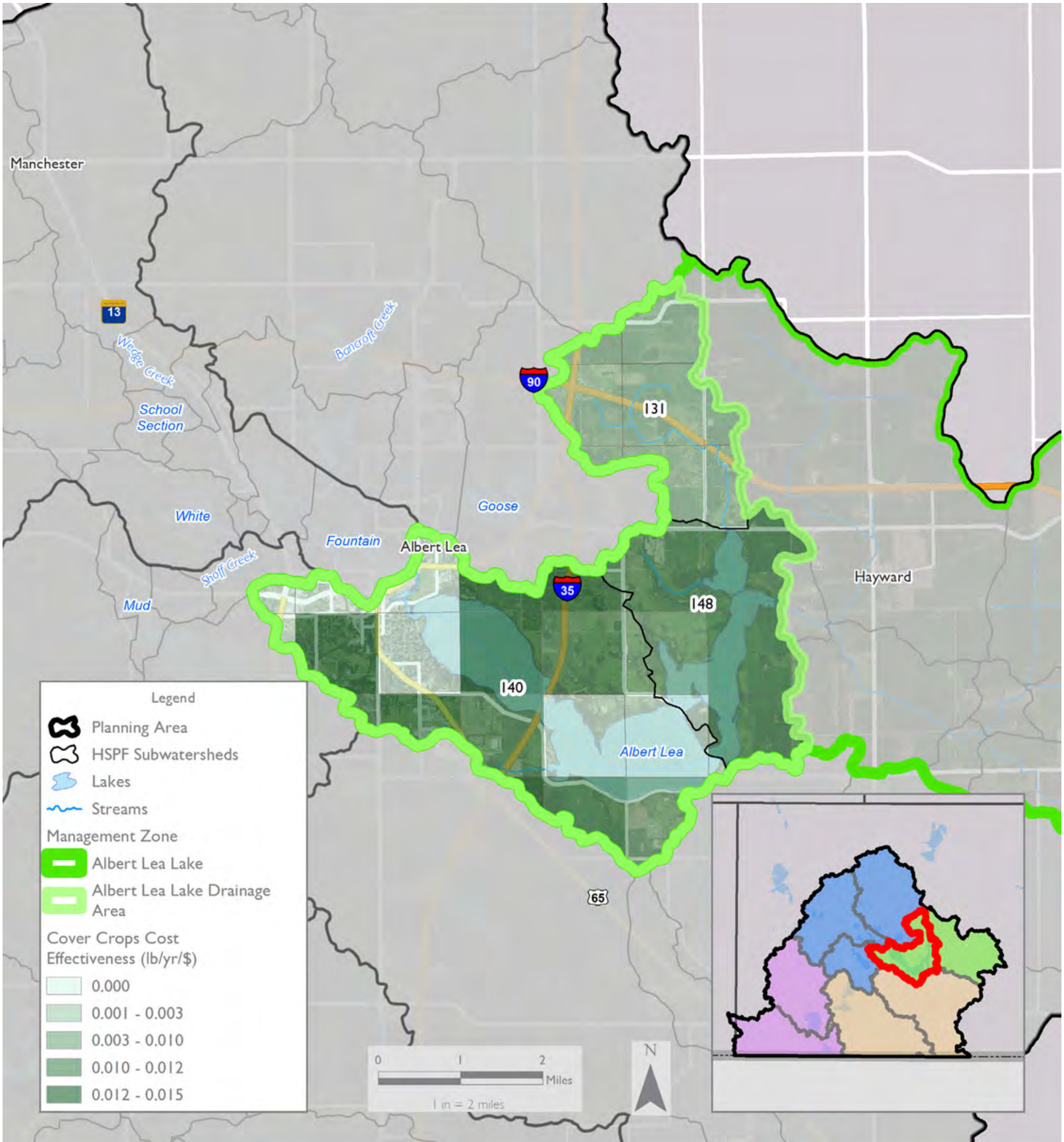


Figure E.26: Albert Lea Lake: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

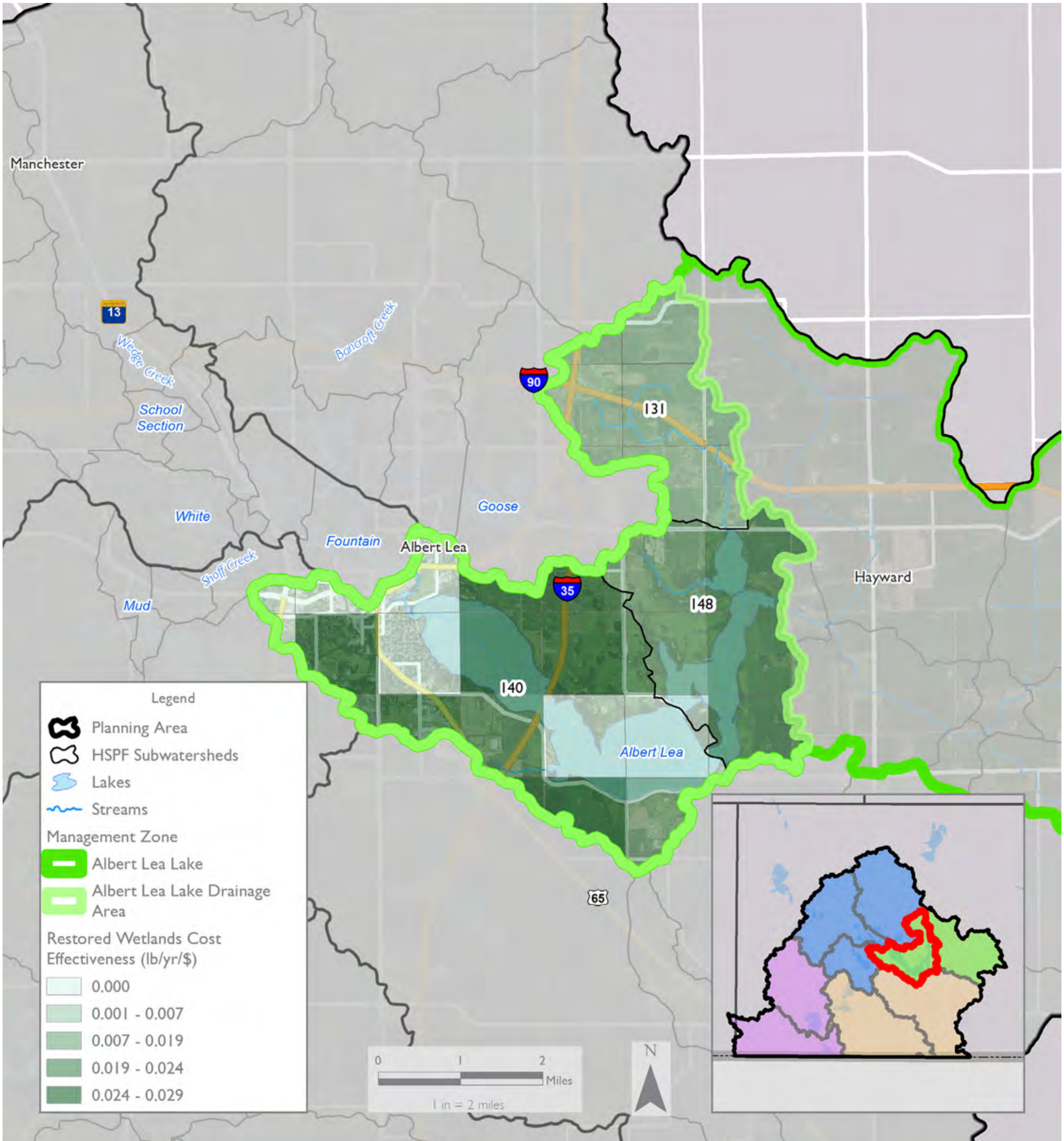


Figure E.27: Albert Lea Lake: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

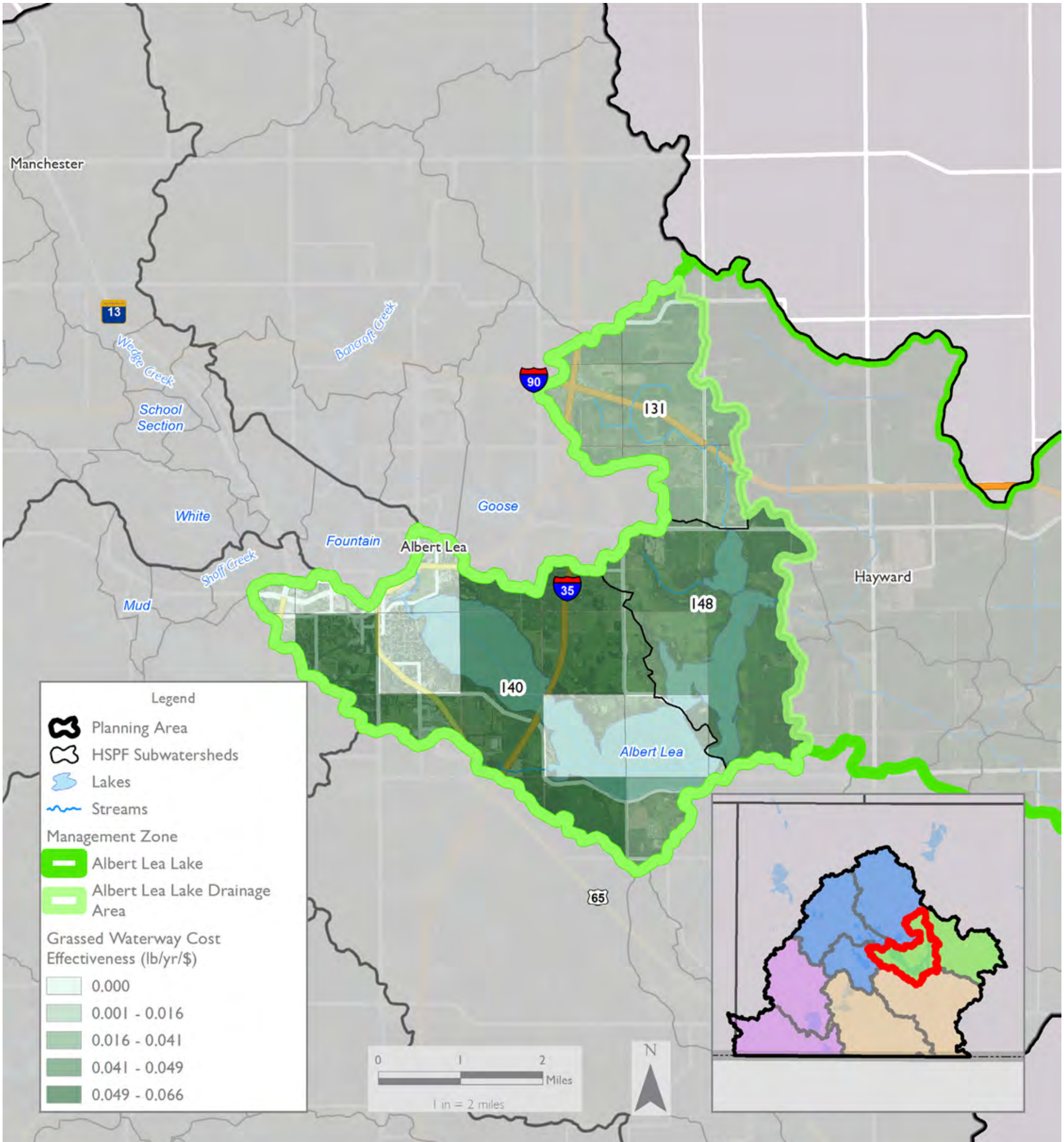


Figure E.28: Albert Lea Lake: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

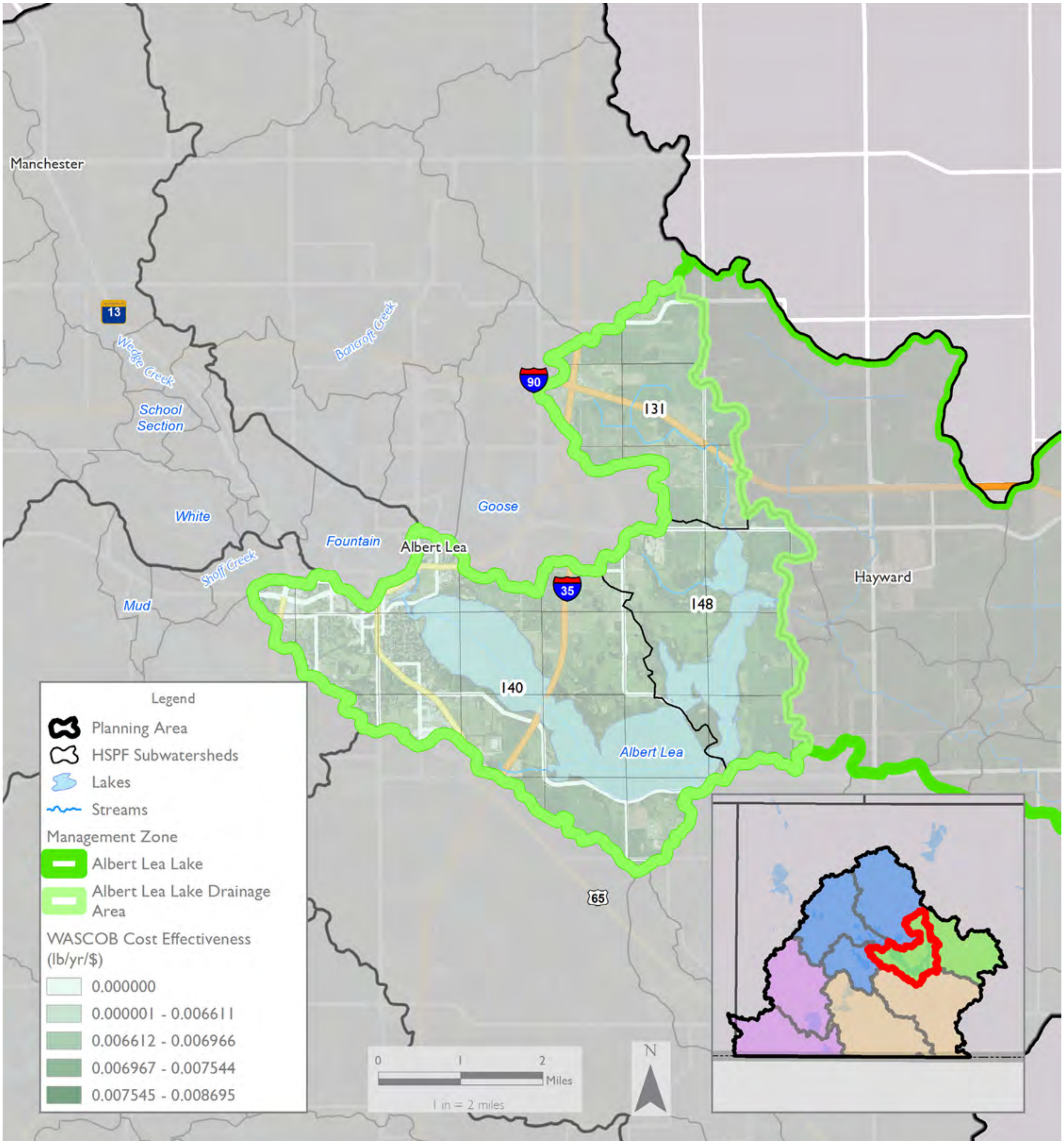


Figure E.29: Albert Lea Lake: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

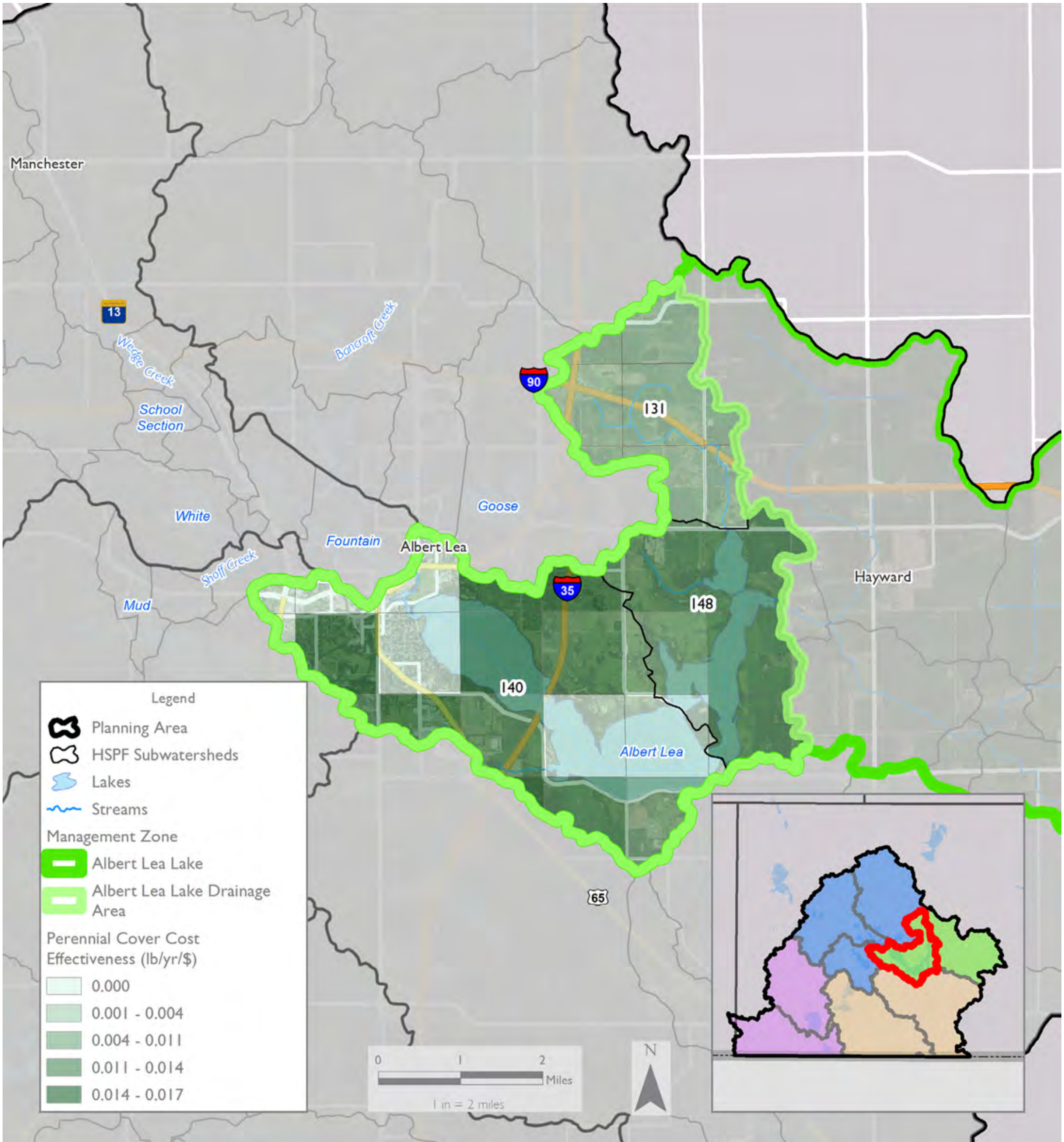


Figure E.30: Albert Lea Lake: Perennial Implementation Targeting Areas for Treating Total Phosphorus

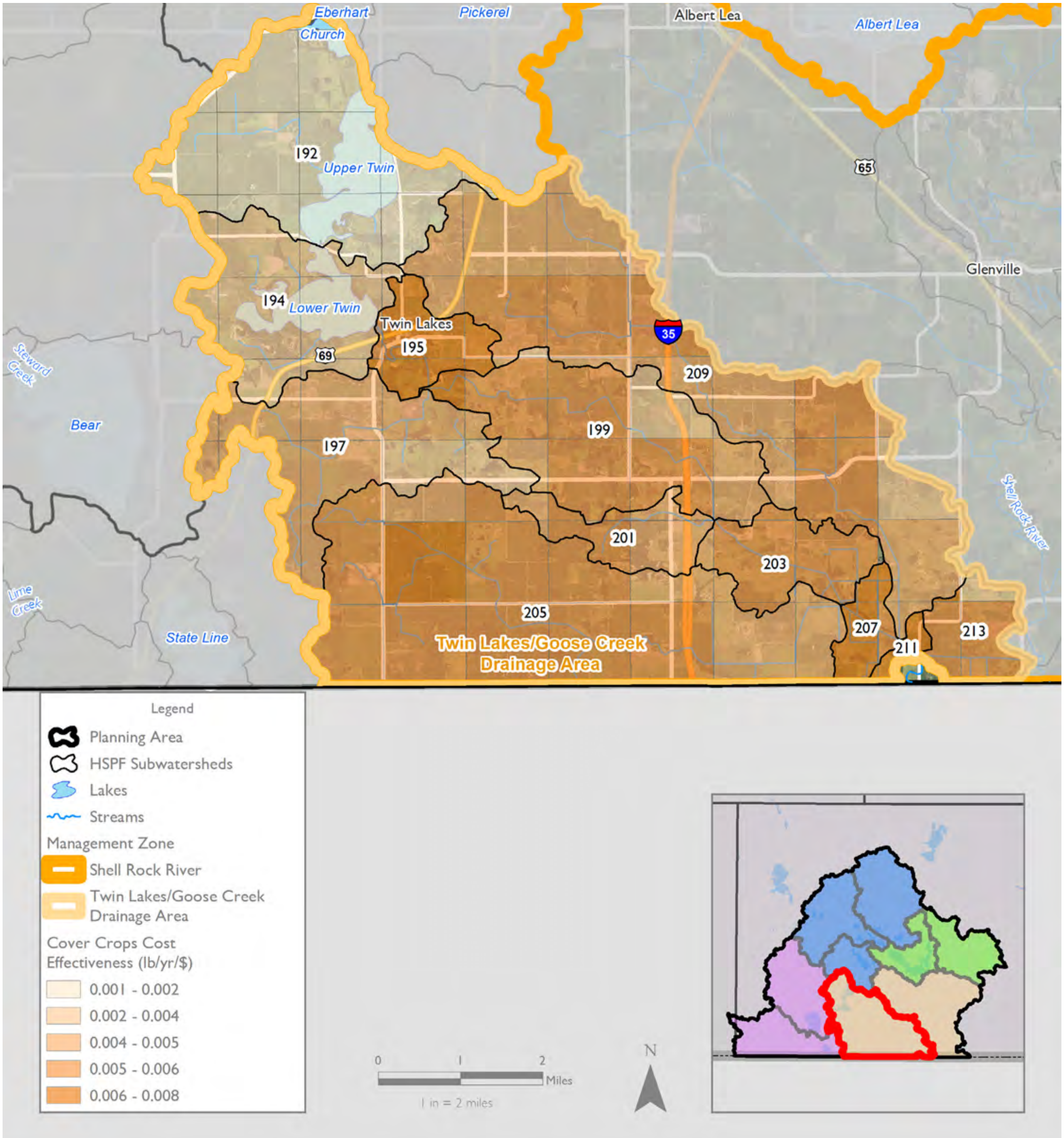


Figure E.31: Twin Lakes/Goose Creek: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

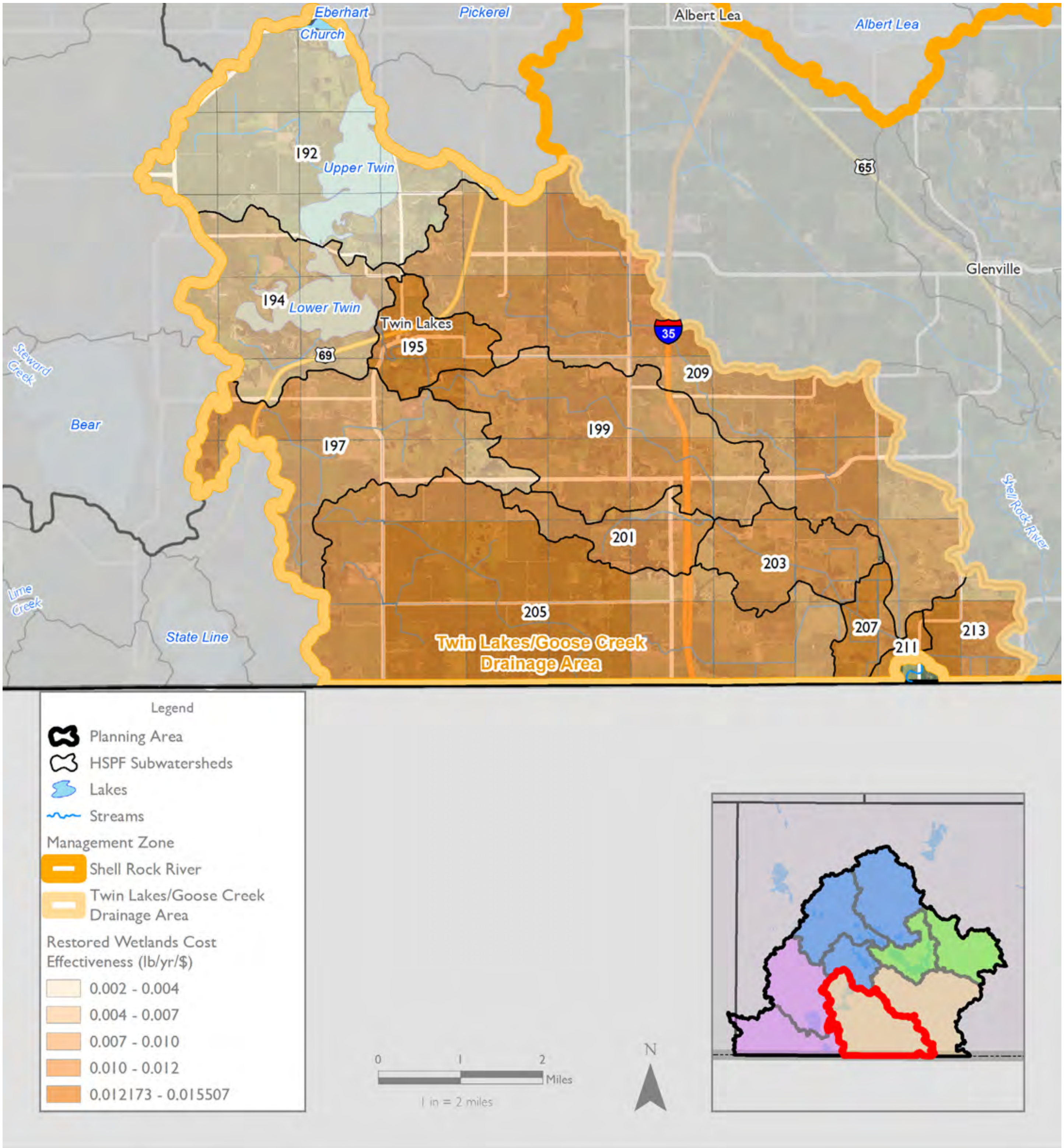


Figure E.32: Twin Lakes/Goose Creek: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

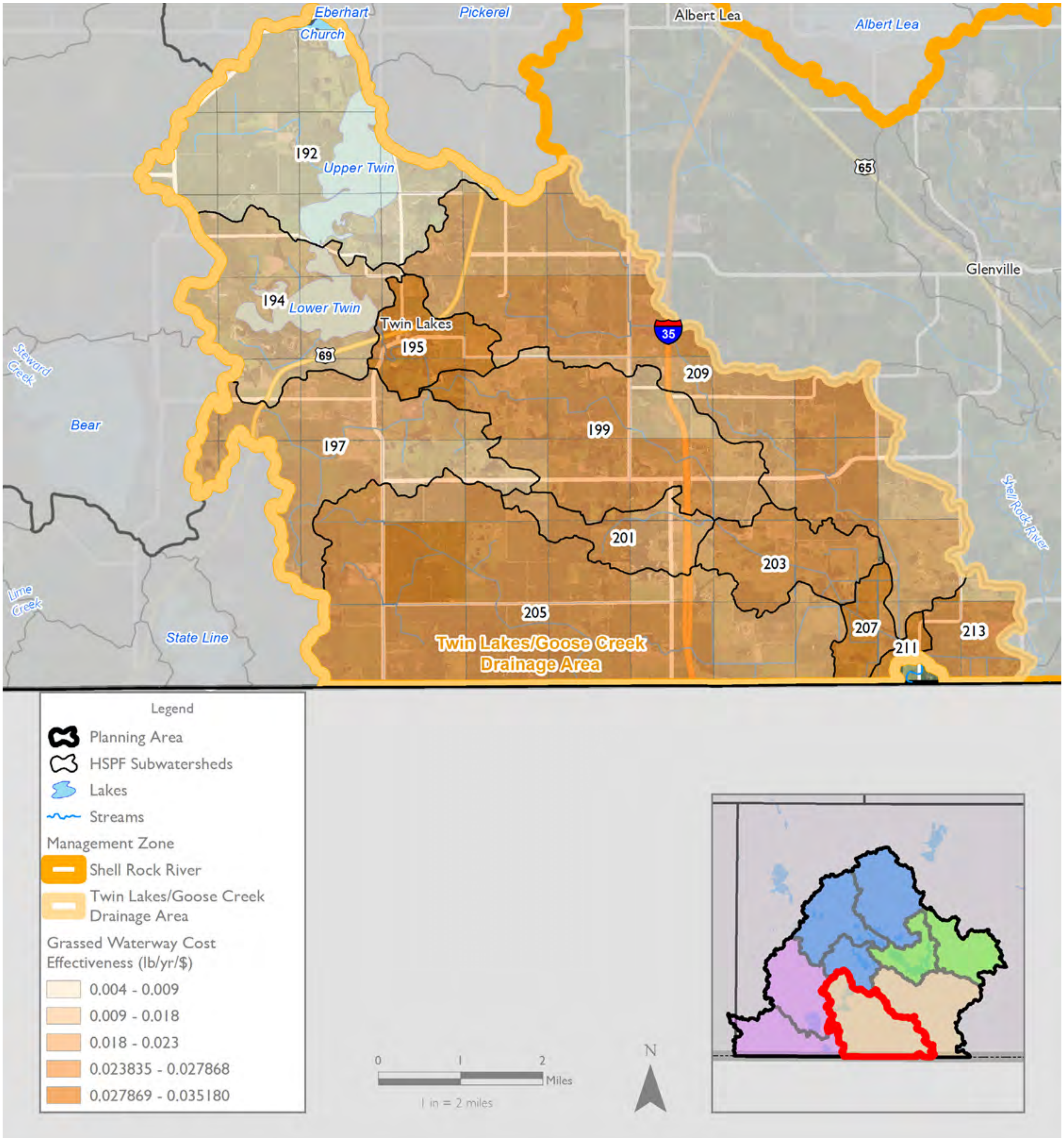


Figure E.33: Twin Lakes/Goose Creek: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

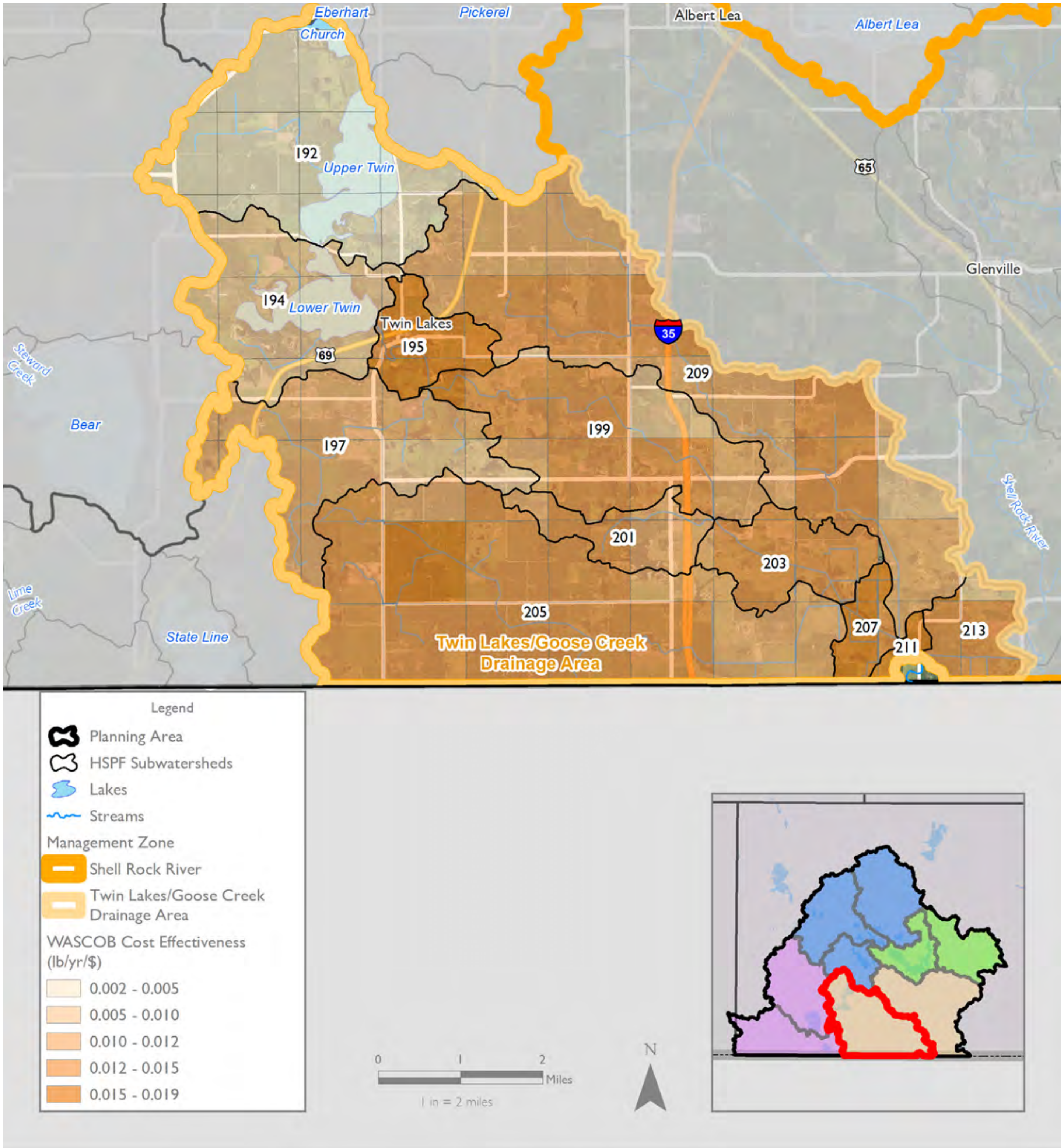


Figure E.34: Twin Lakes/Goose Creek: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

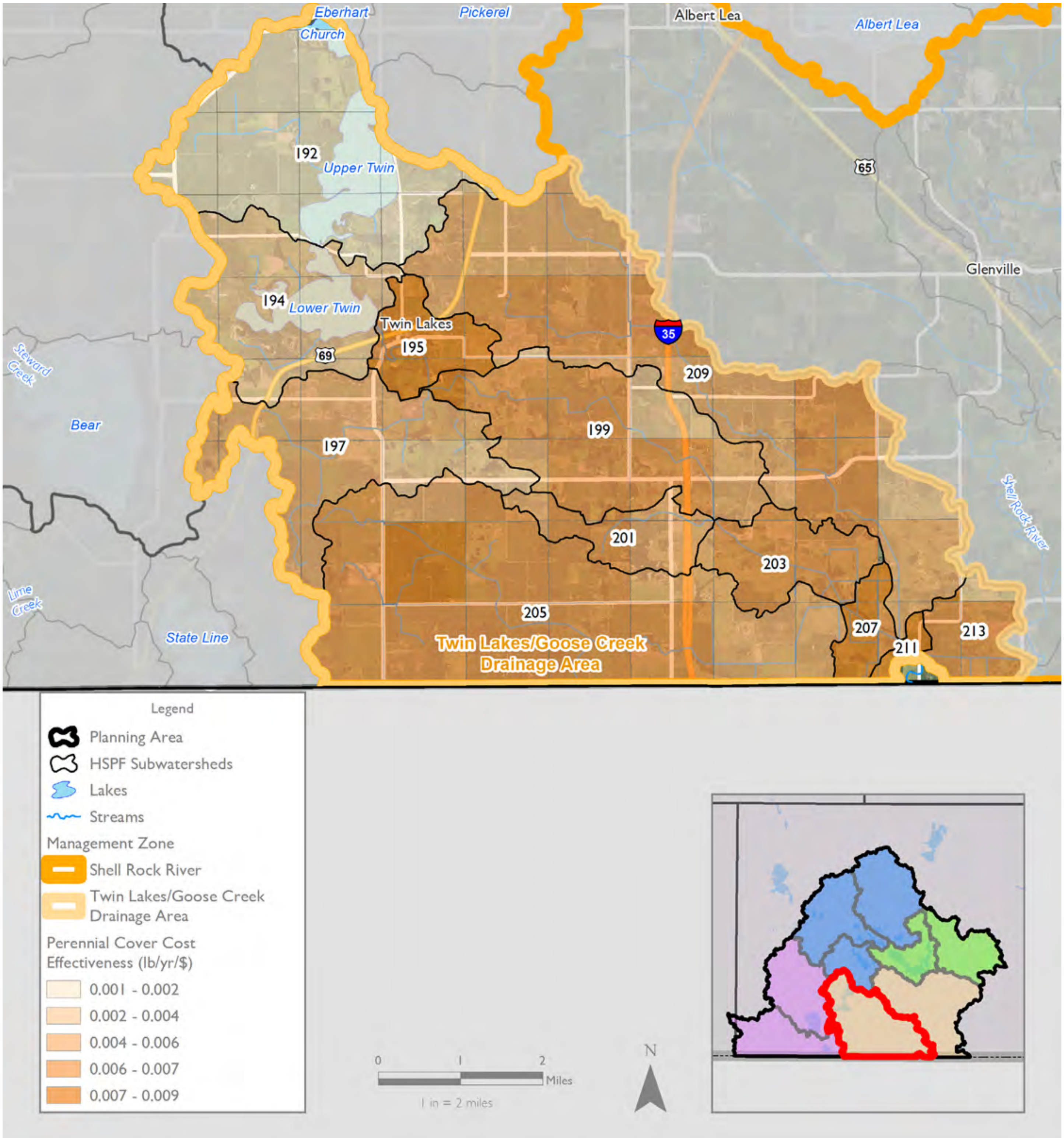


Figure E.35: Twin Lakes/Goose Creek: Perennial Implementation Targeting Areas for Treating Total Phosphorus

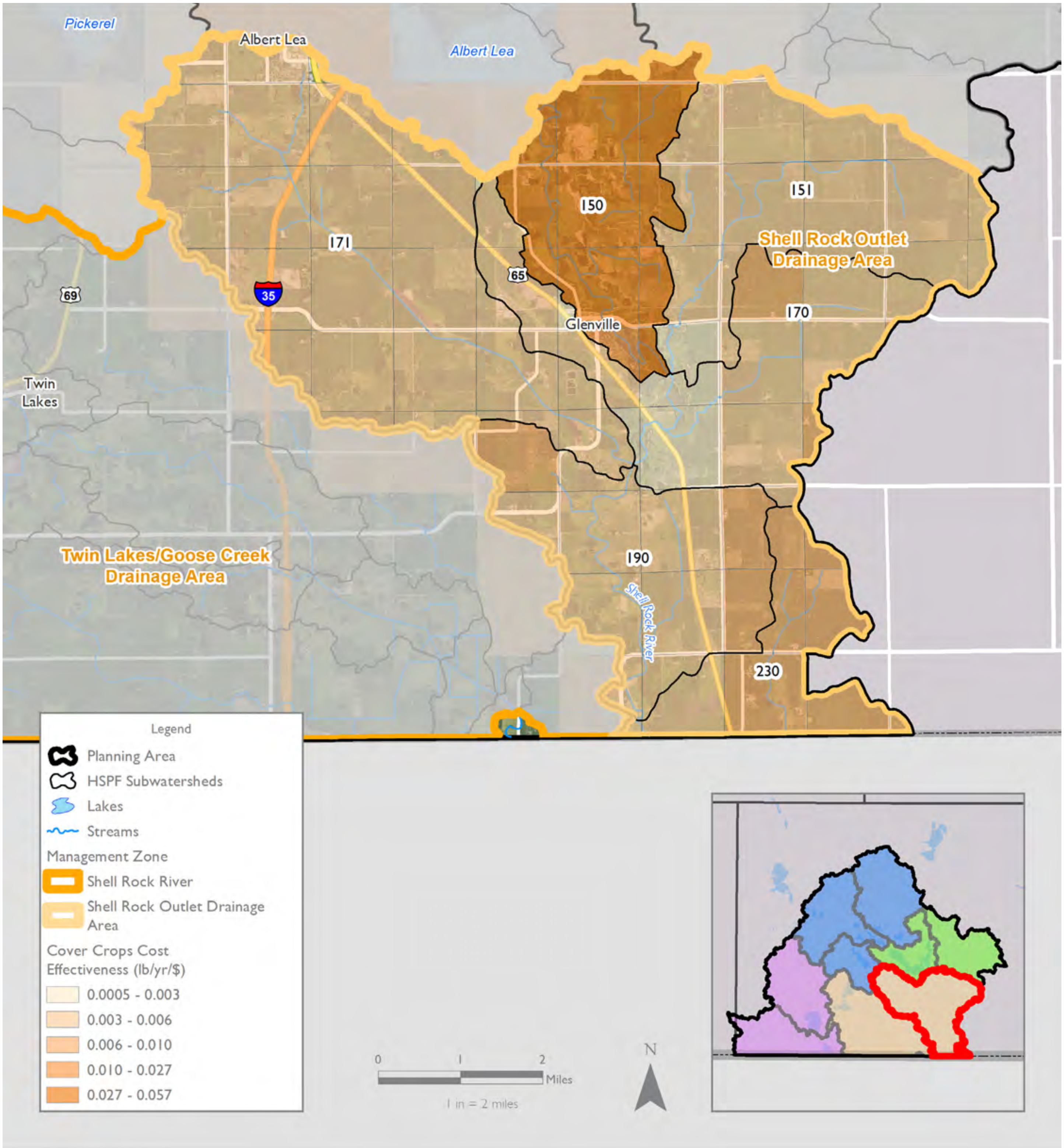


Figure E.36: Shell Rock Outlet: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

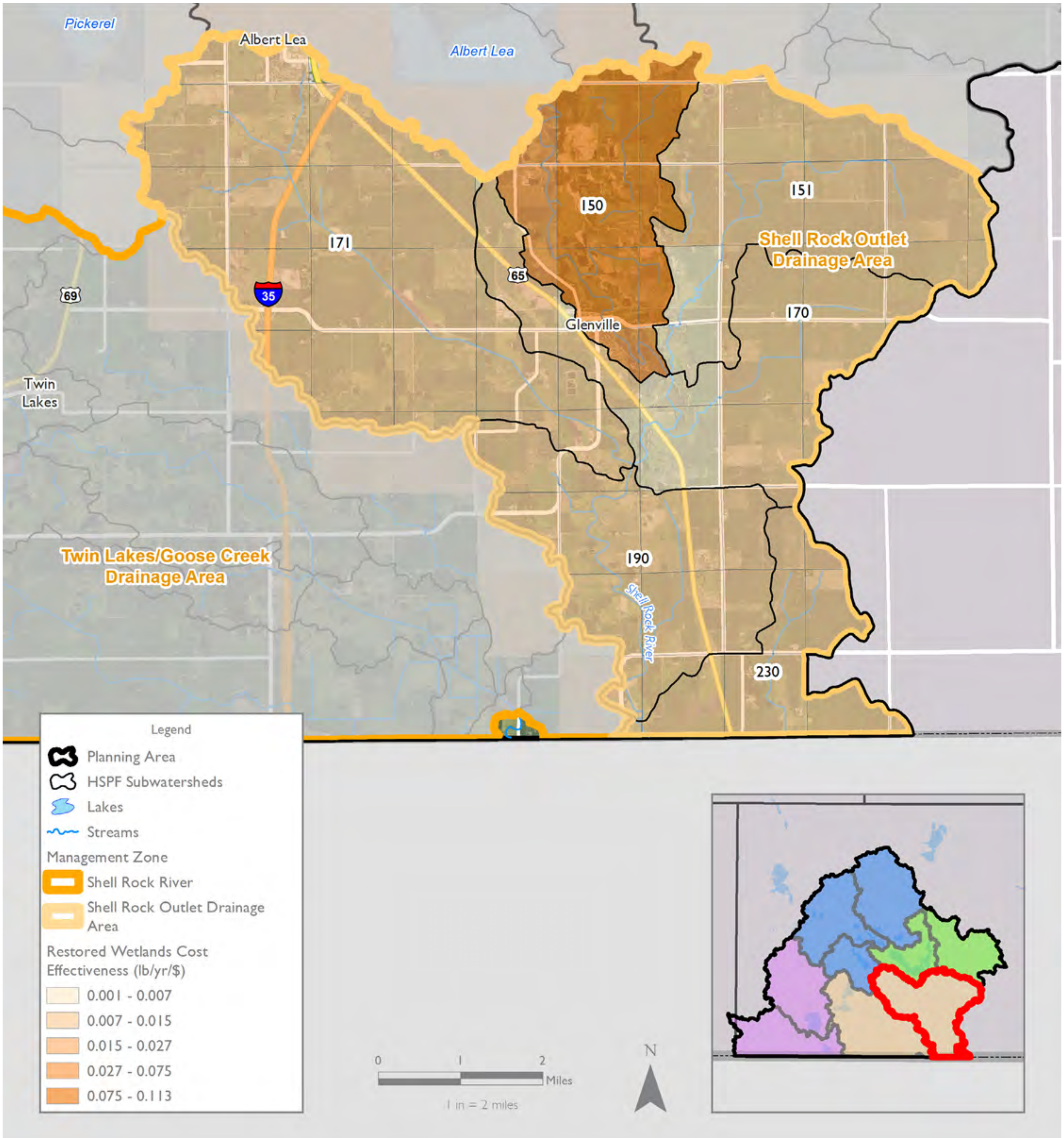


Figure E.37: Shell Rock Outlet: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

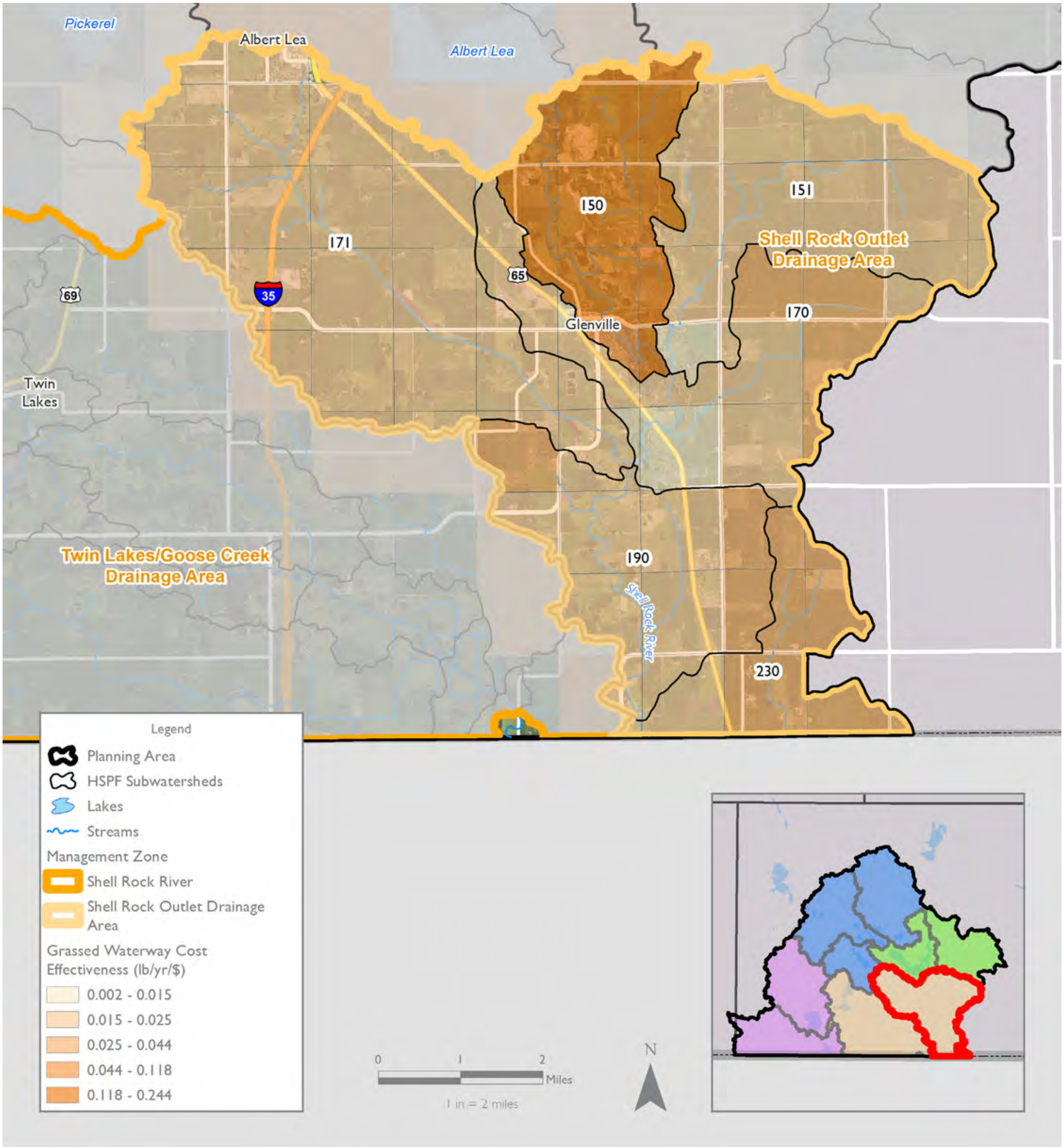


Figure E.38: Shell Rock Outlet: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

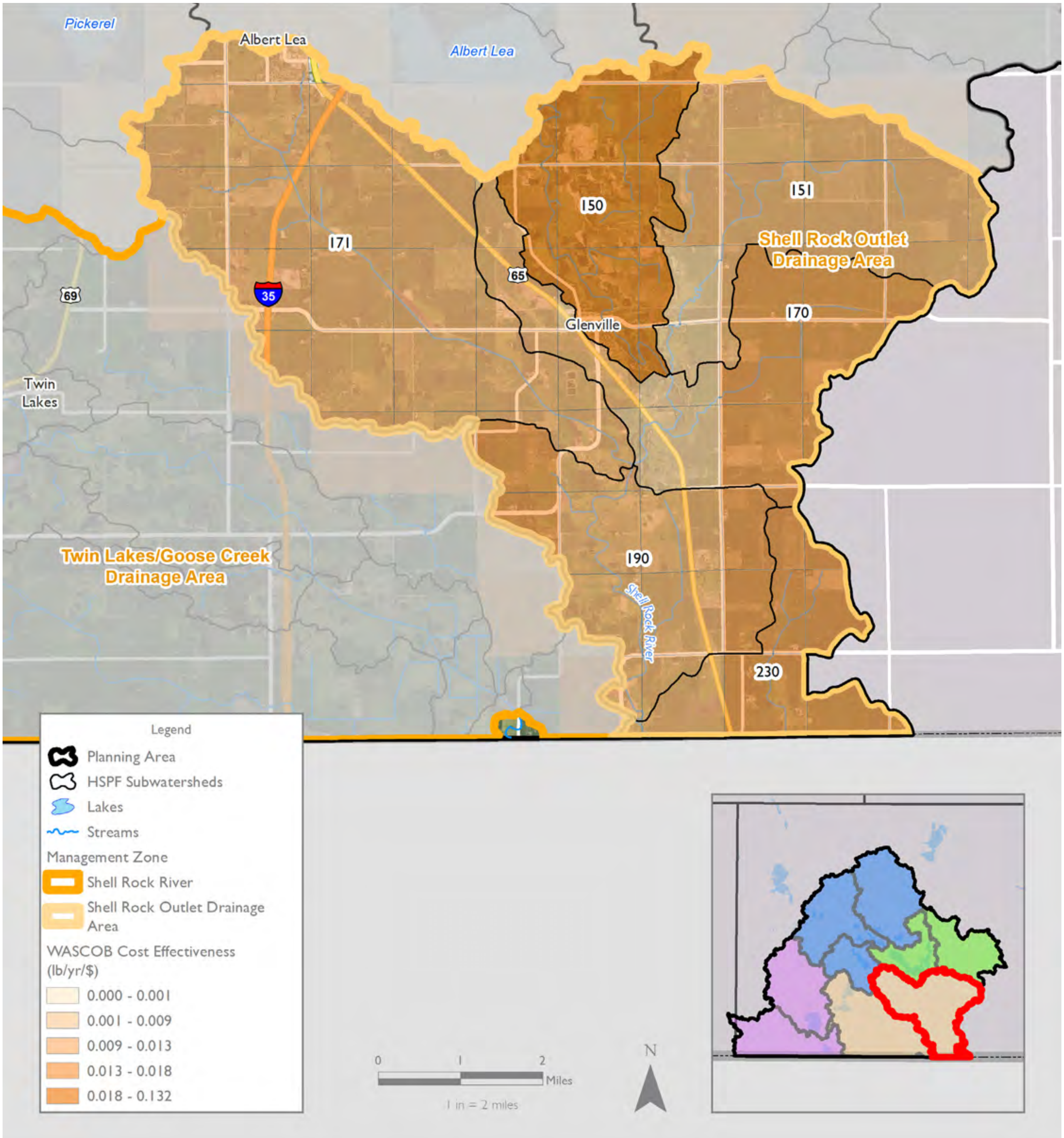


Figure E.39: Shell Rock Outlet: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

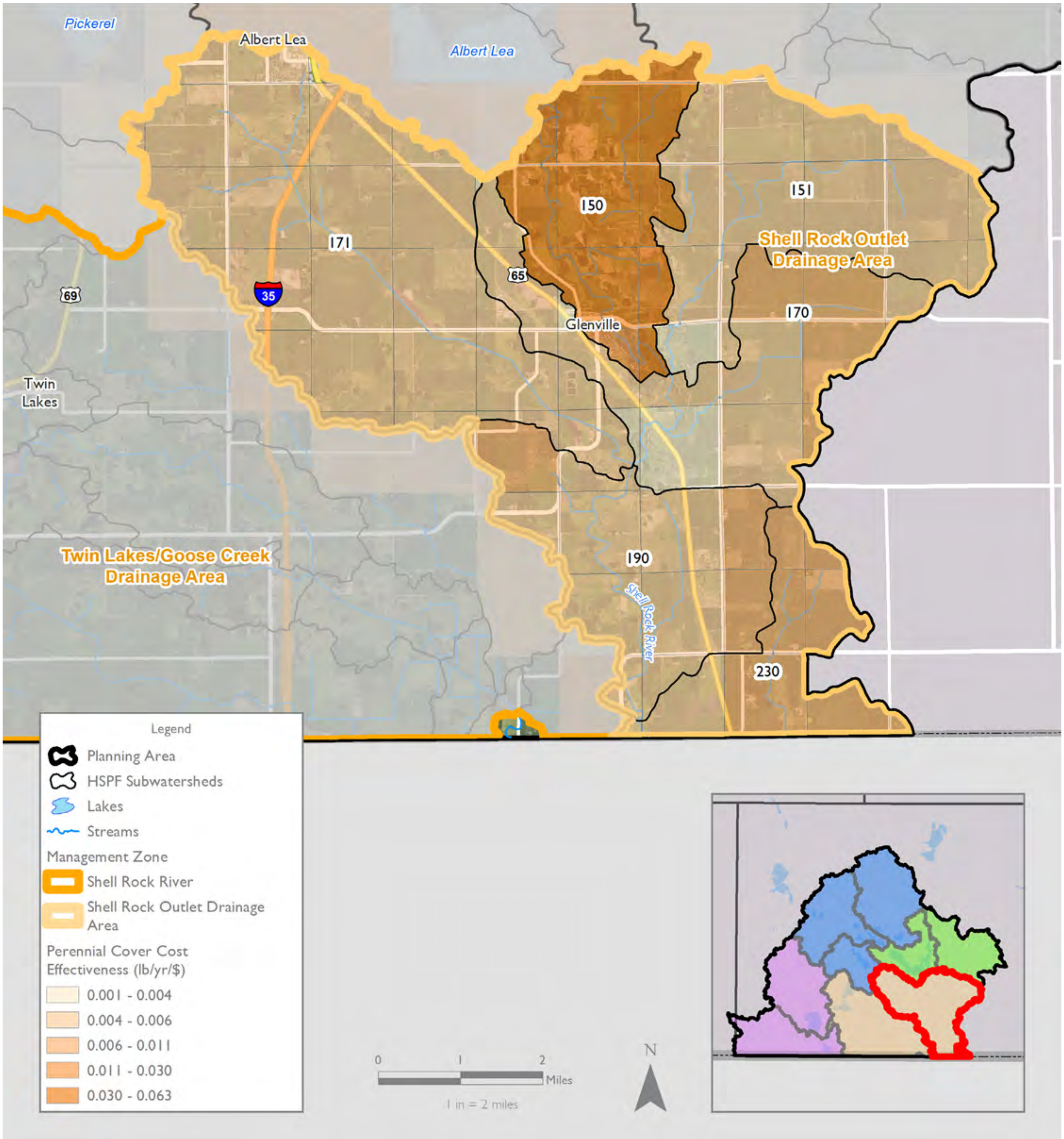


Figure E.40: Shell Rock Outlet: Perennial Implementation Targeting Areas for Treating Total Phosphorus

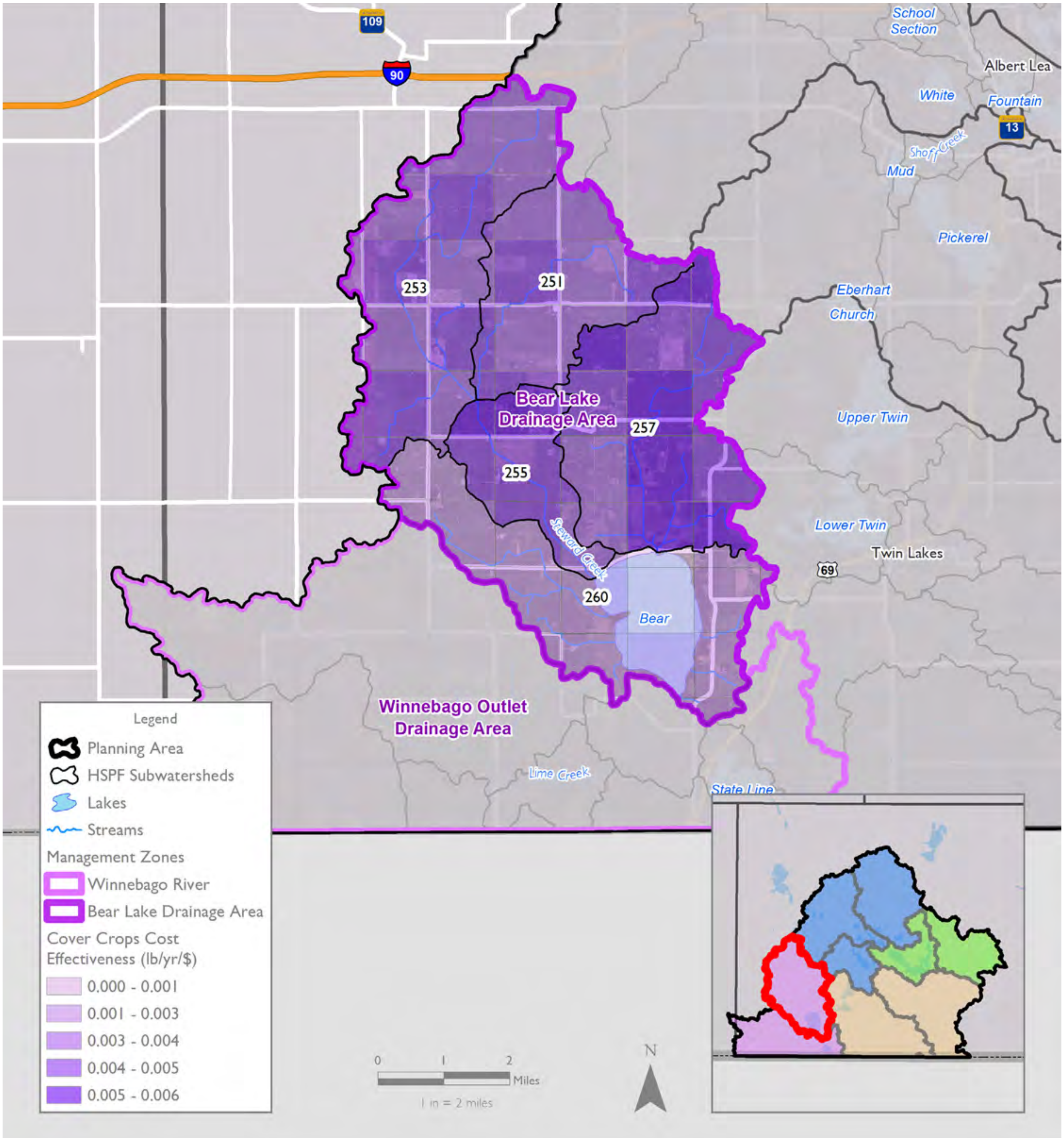


Figure E.41: Bear Lake: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

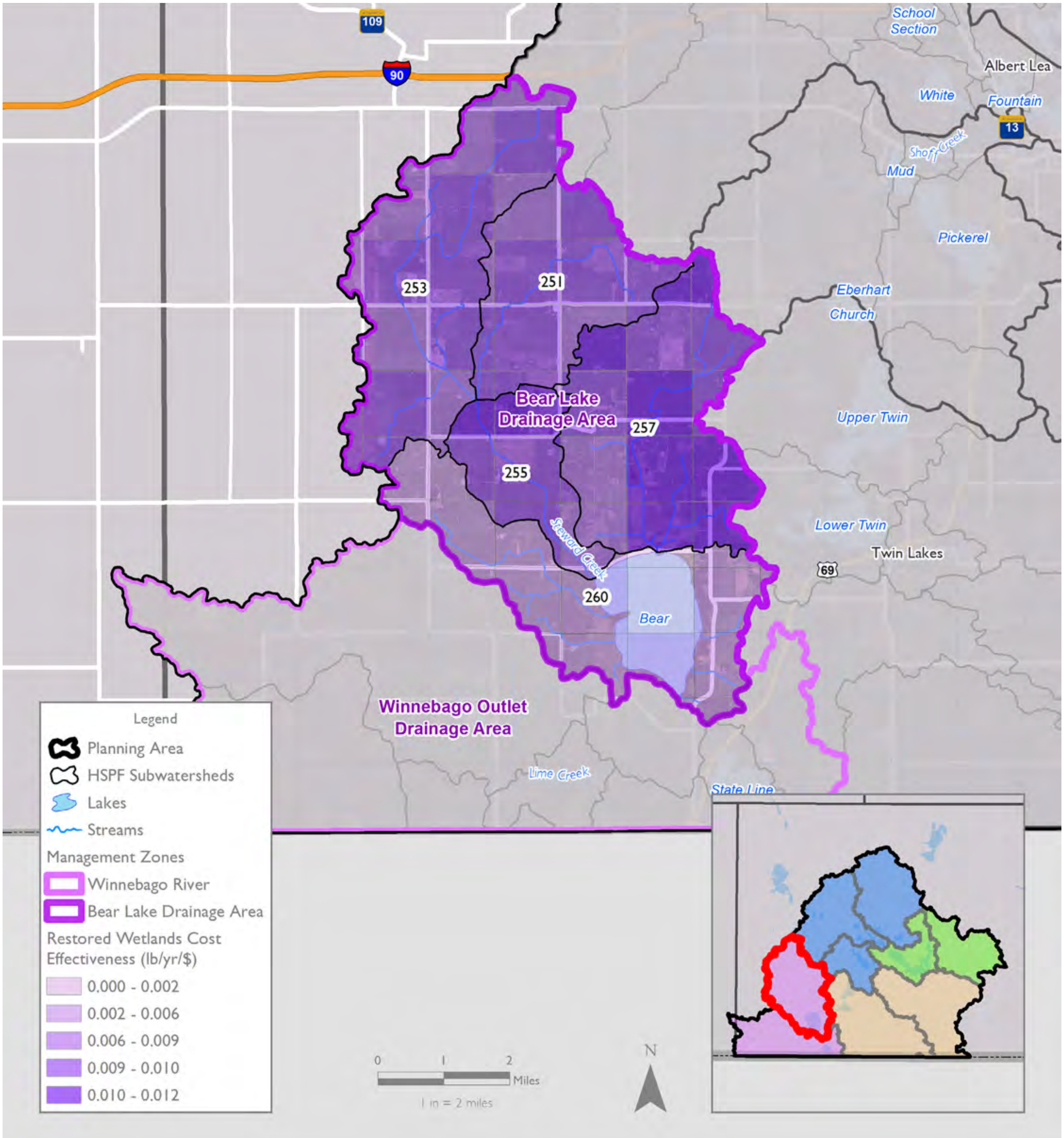


Figure E.42: Bear Lake: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

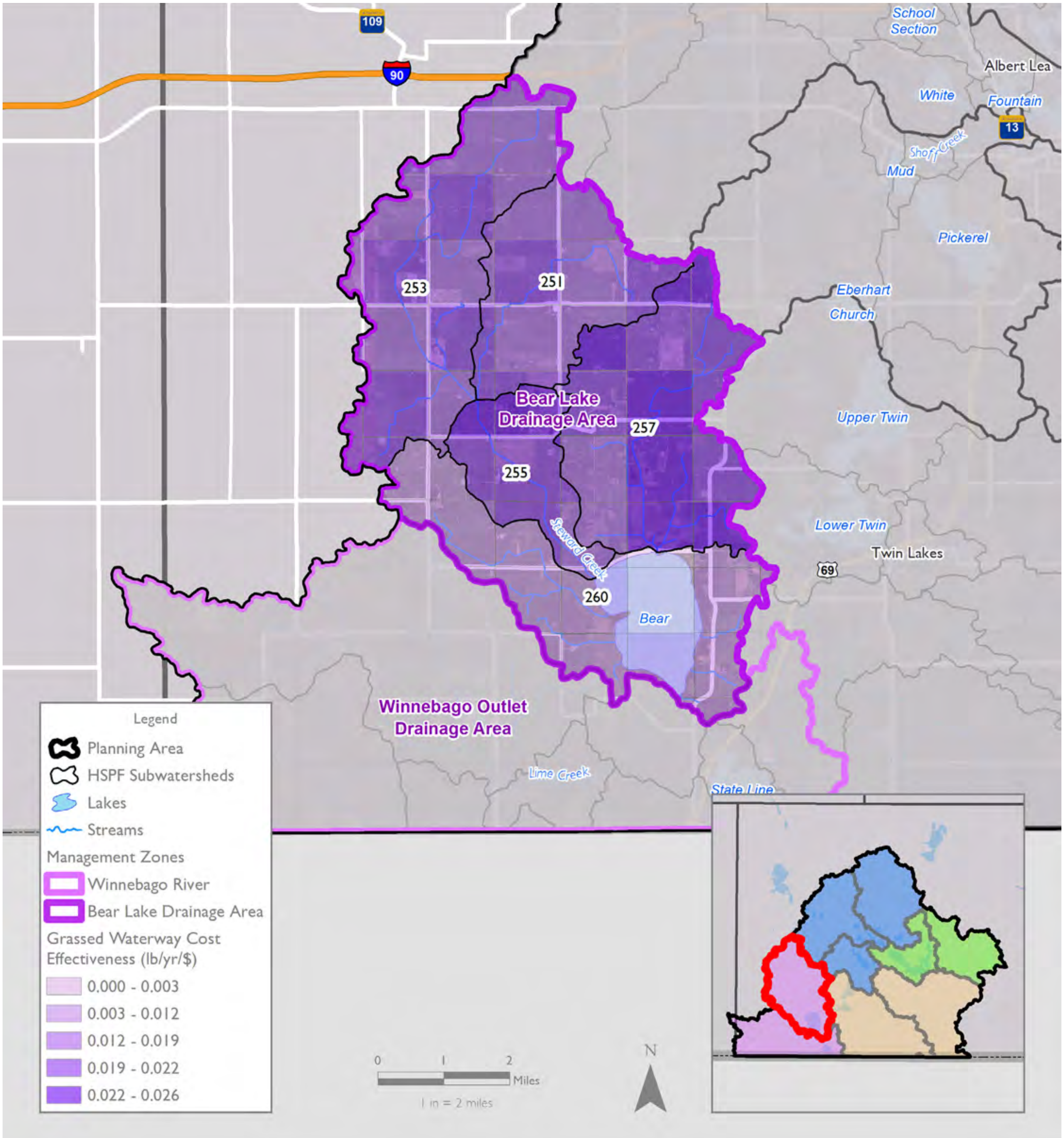


Figure E.43: Bear Lake: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

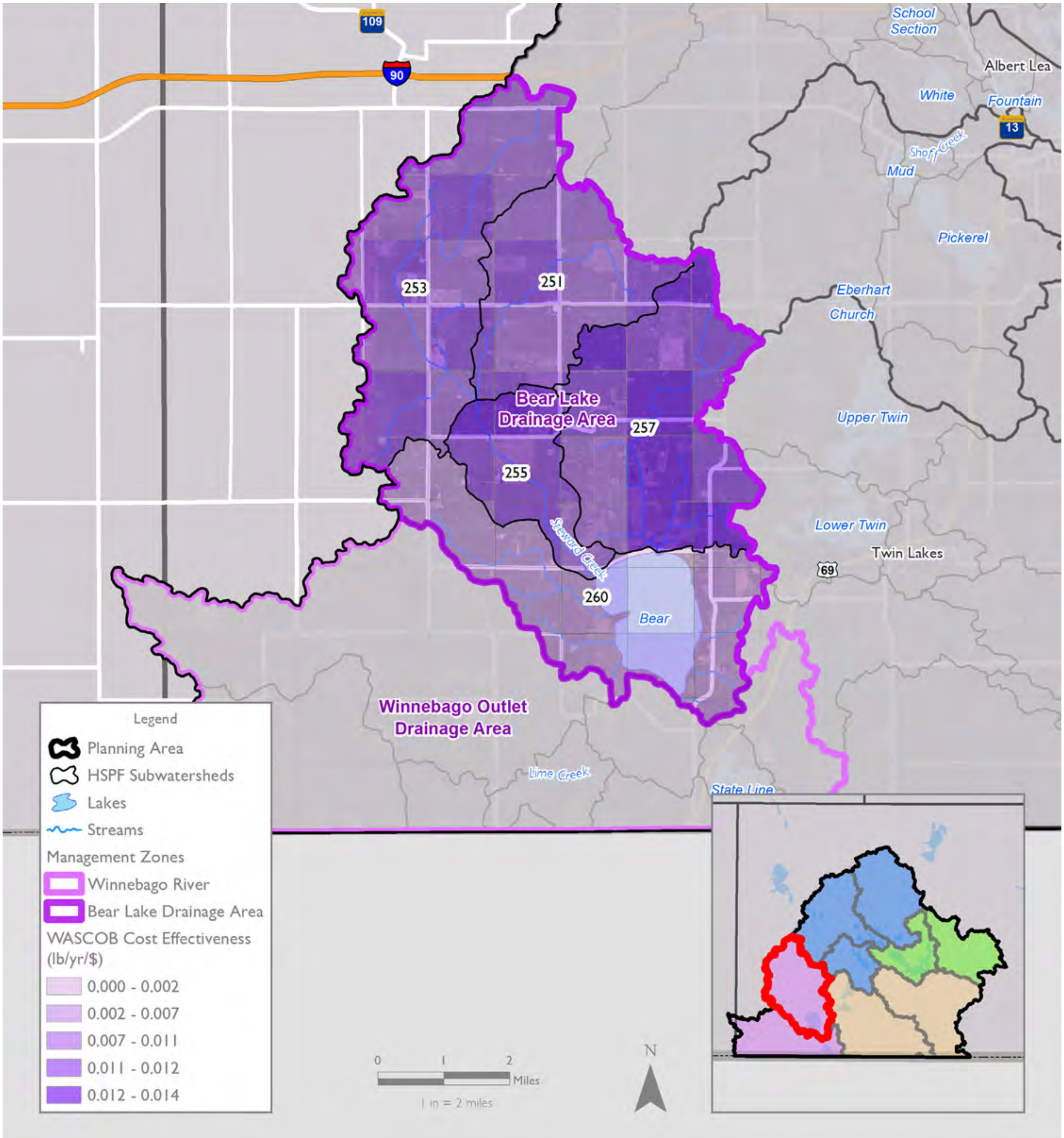


Figure E.44: Bear Lake: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

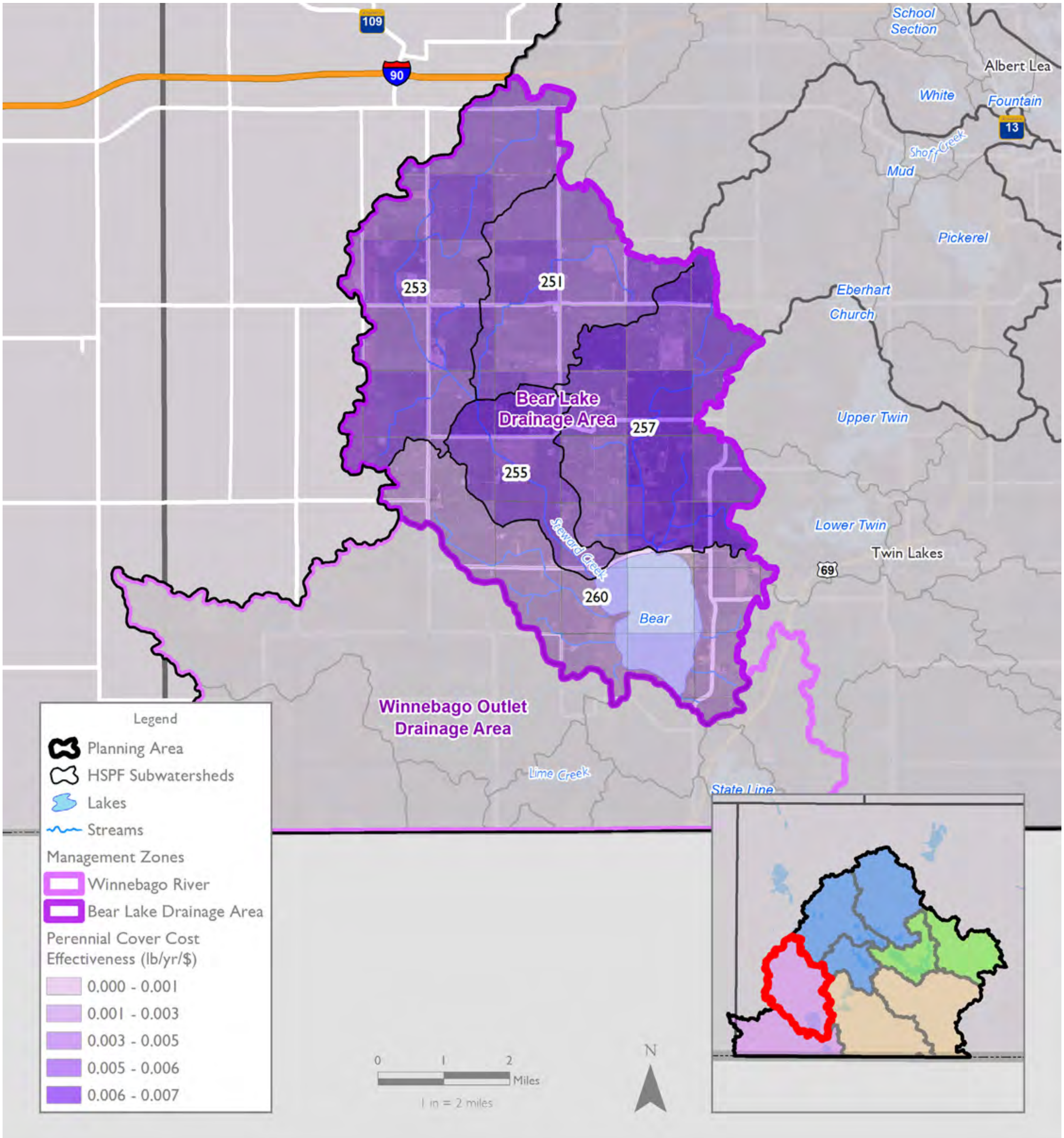


Figure E.45: Bear Lake: Perennial Implementation Targeting Areas for Treating Total Phosphorus

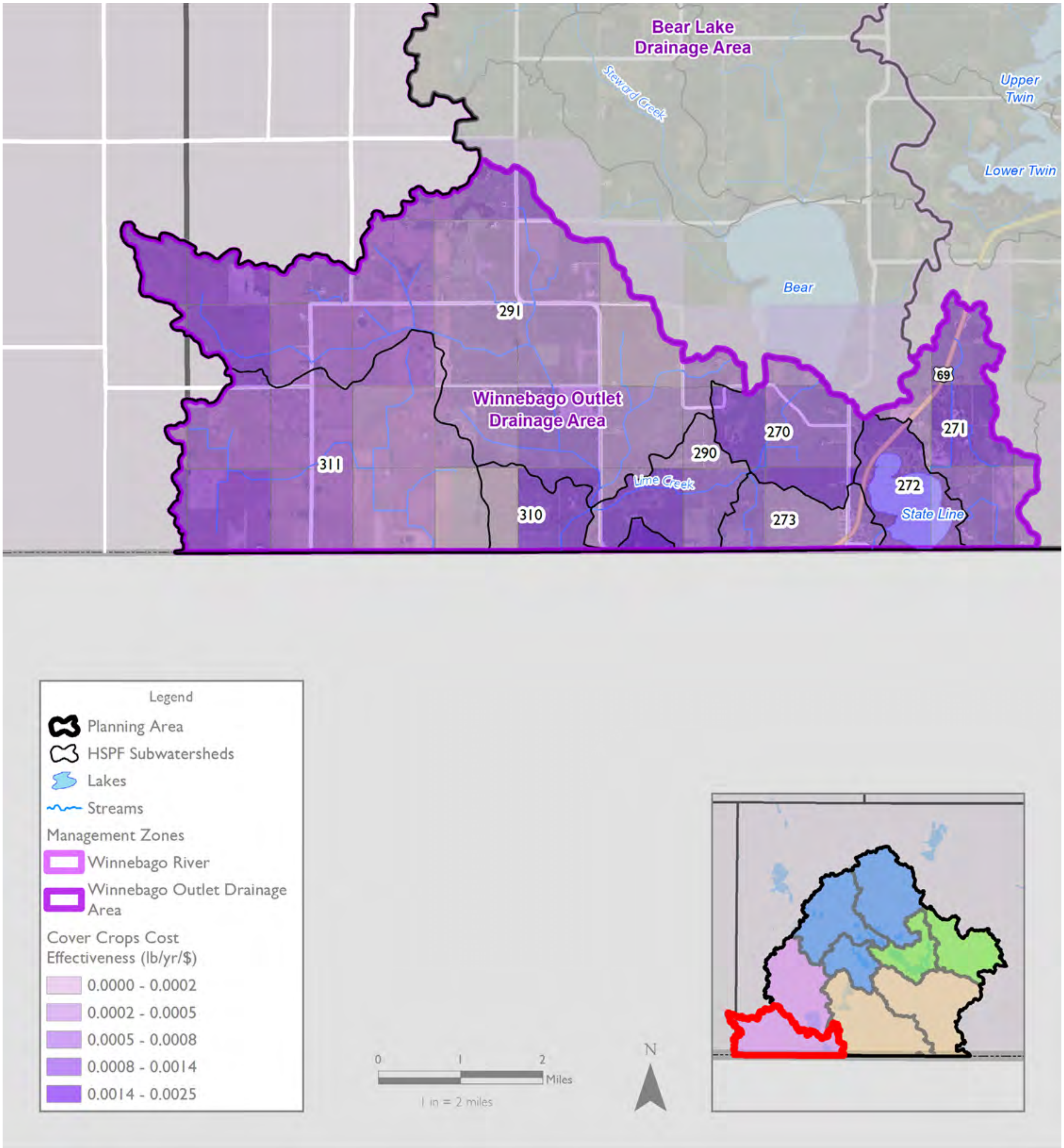


Figure E.46: Winnebago Outlet: Crop Cover Implementation Targeting Areas for Treating Total Phosphorus

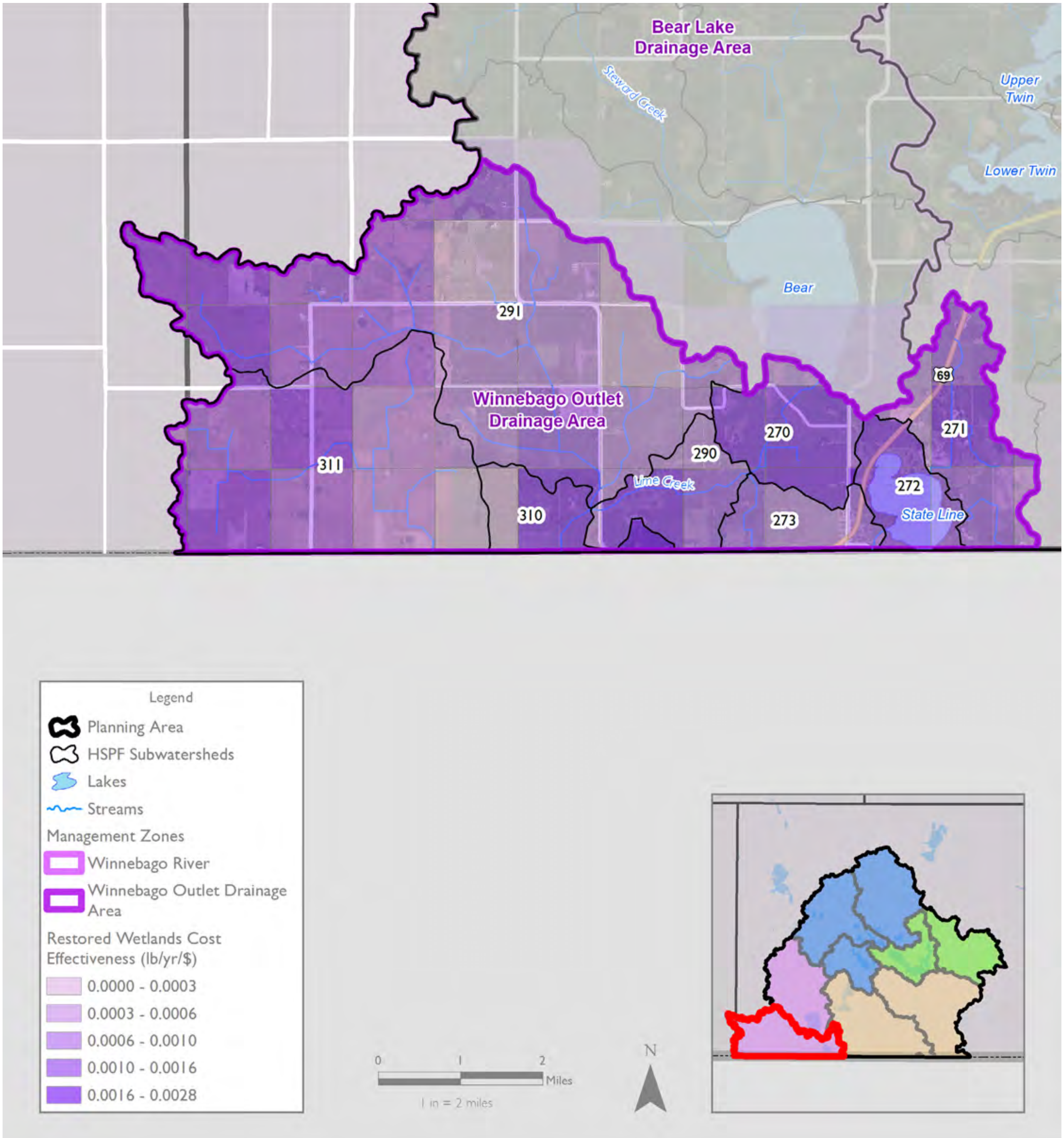


Figure E.47: Winnebago Outlet: Restored Wetland Implementation Targeting Areas for Treating Total Phosphorus

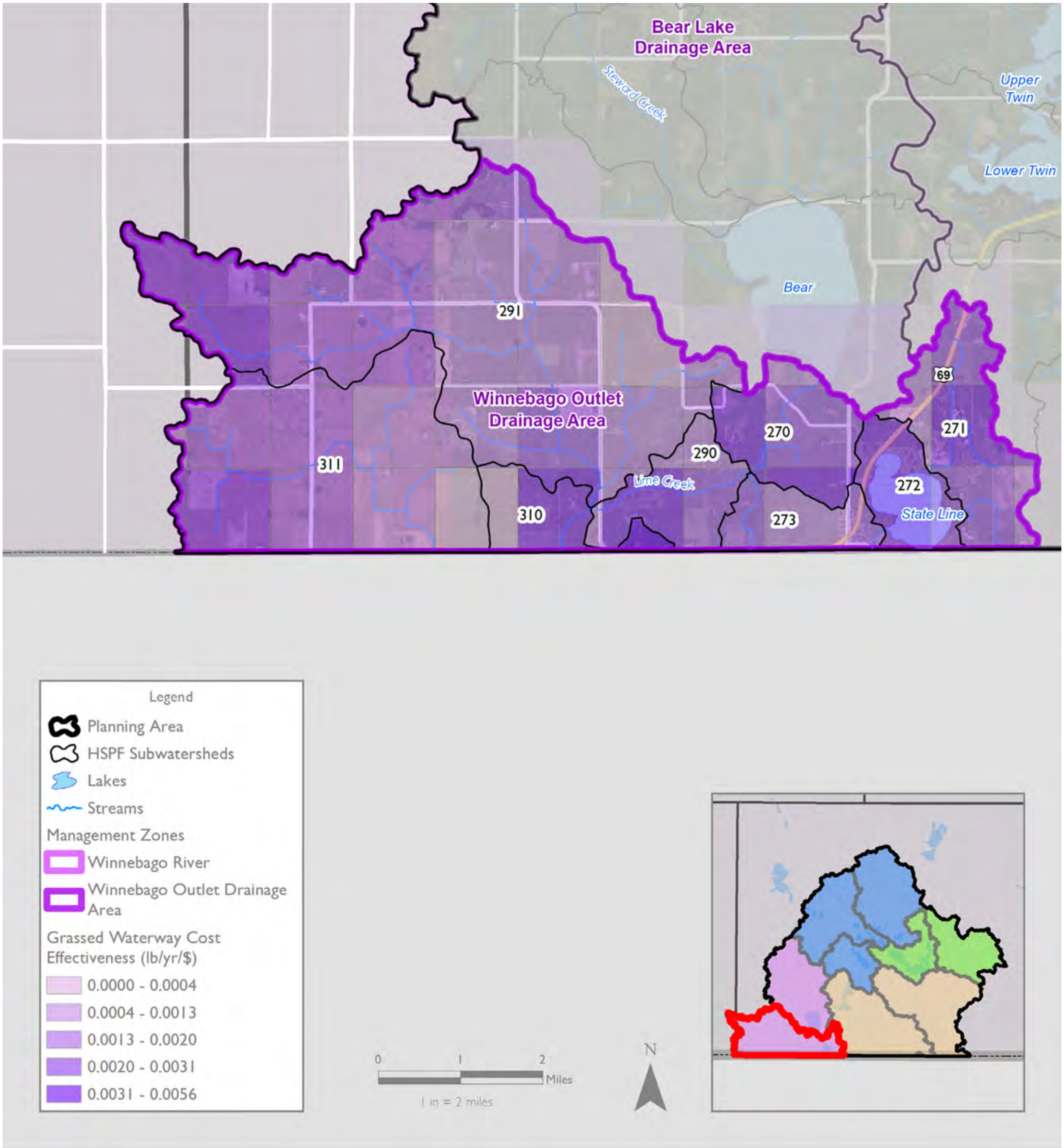


Figure E.48: Winnebago Outlet: Grassed Waterway Implementation Targeting Areas for Treating Total Phosphorus

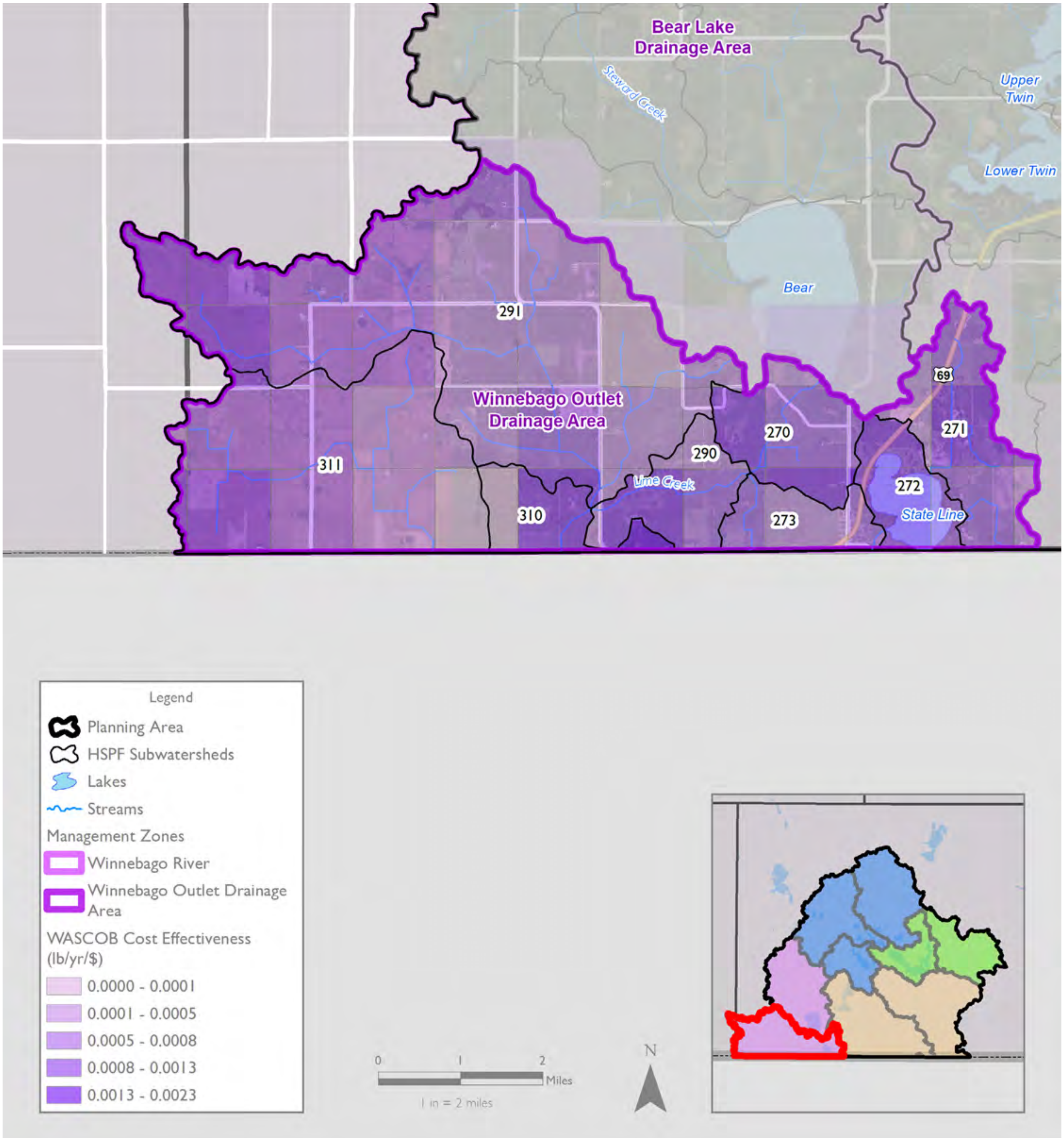


Figure E.49: Winnebago Outlet: WASCOB Implementation Targeting Areas for Treating Total Phosphorus

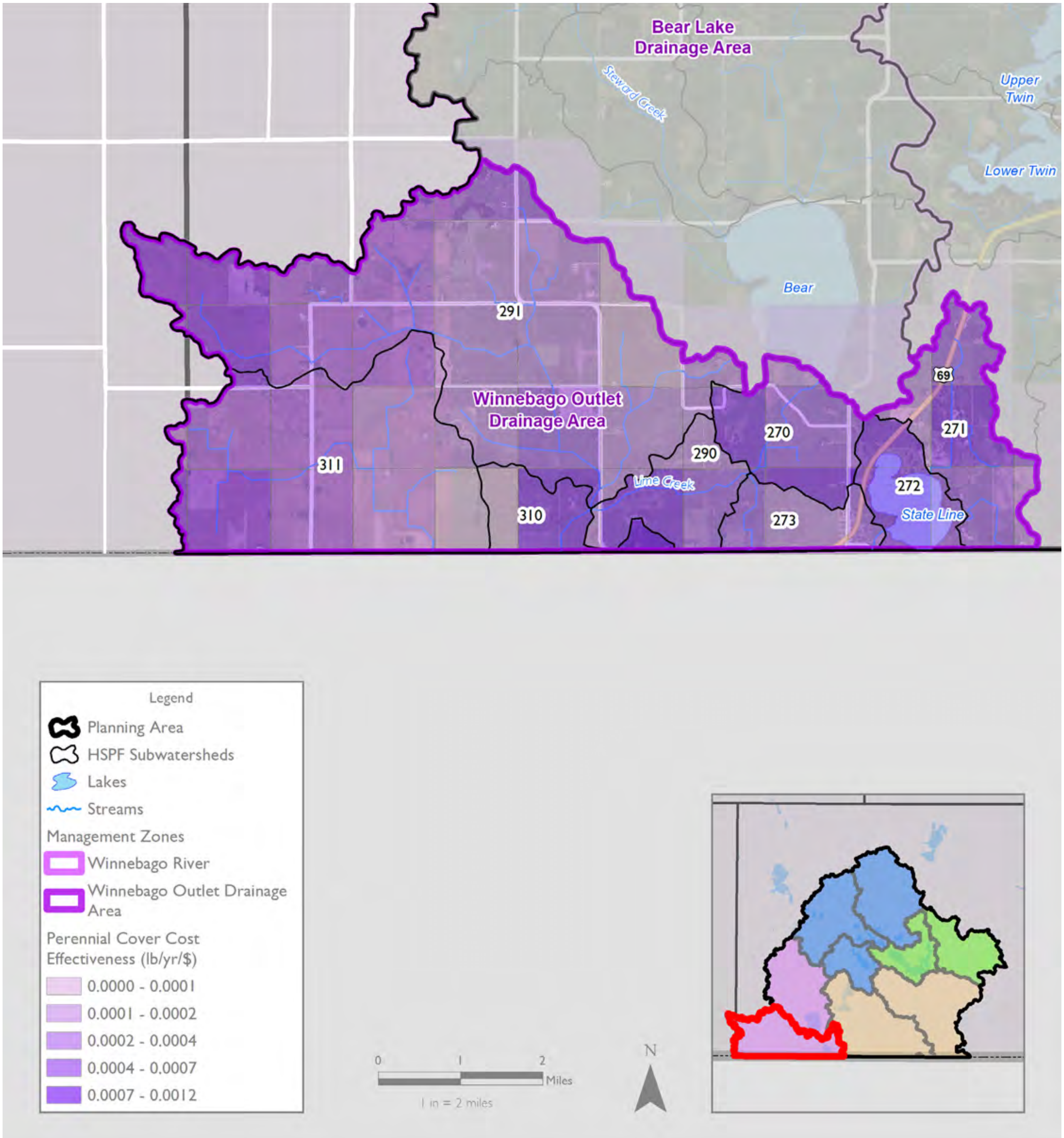
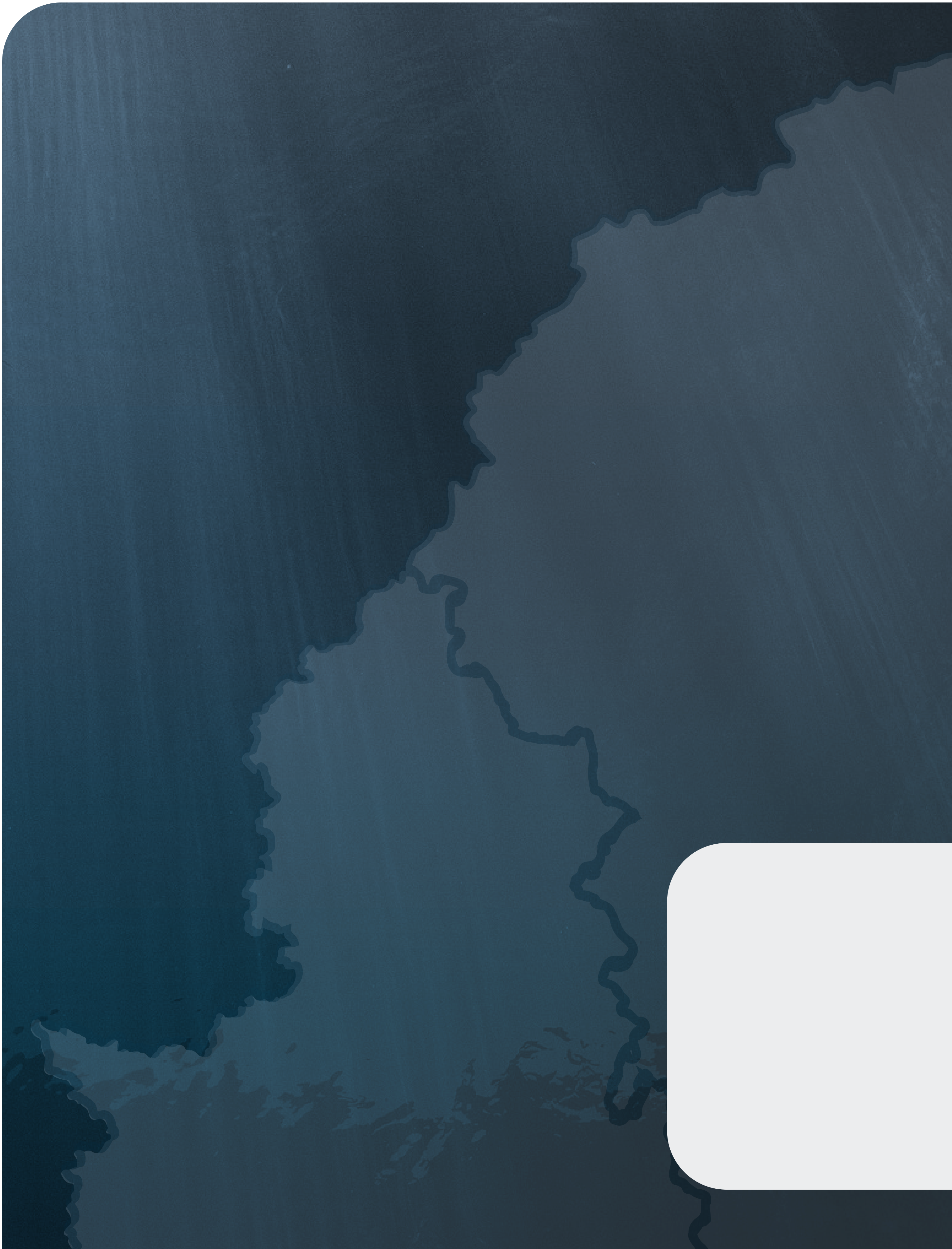
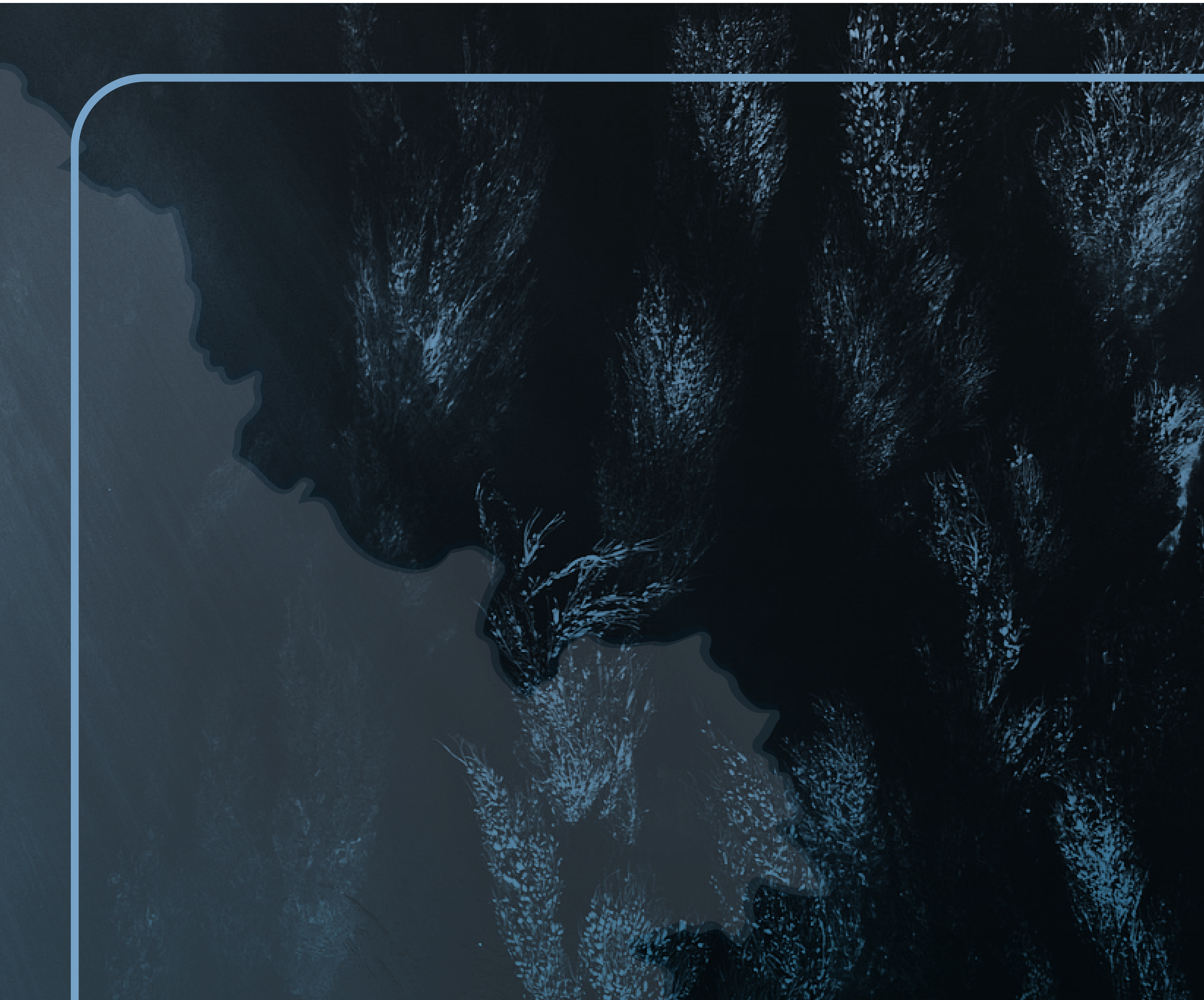


Figure E.50: Winnebago Outlet: Perennial Implementation Targeting Areas for Treating Total Phosphorus





APPENDIX F
CLIMATE TRENDS

1.CLIMATE

Data indicates that there are increasing temperatures and changing precipitation patterns including intensity, frequency and duration of precipitation events as well as increasing length between precipitation events. These patterns will influence the way land use practices impact the water resources.

1.1 TEMPERATURE DATA

Long-term average annual temperature data (1895 – 2018) for the National Oceanic and Atmospheric Administration's (NOAA's) Minnesota Climate Division 8 illustrate a trend of increasing temperatures over the last century, with an increase of 0.1^0 Fahrenheit (^{0}F) per decade (Figure 1-1) [NOAA, 2019]. Average minimum temperatures (Figure 1-2) have increased at a higher rate (0.3^{0}F per decade) than maximum temperatures (Figure 1-3), which have remained consistent across the period of record with a change of 0.0^{0}F per decade. Historical season average temperature trends for winter (December-February) and summer (June-August) are shown in Figure 1-4 and Figure 1-5, respectively. Increase in average temperature during the winter months (0.2^{0}F per decade) have been higher than summer months (0.1^{0}F per decade).

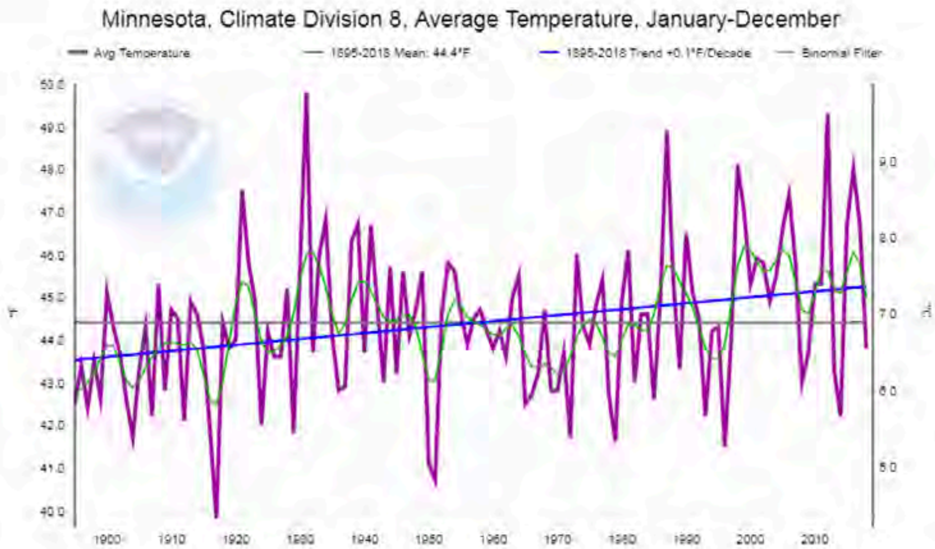


Figure 1-1. Average Annual Temperature for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

1

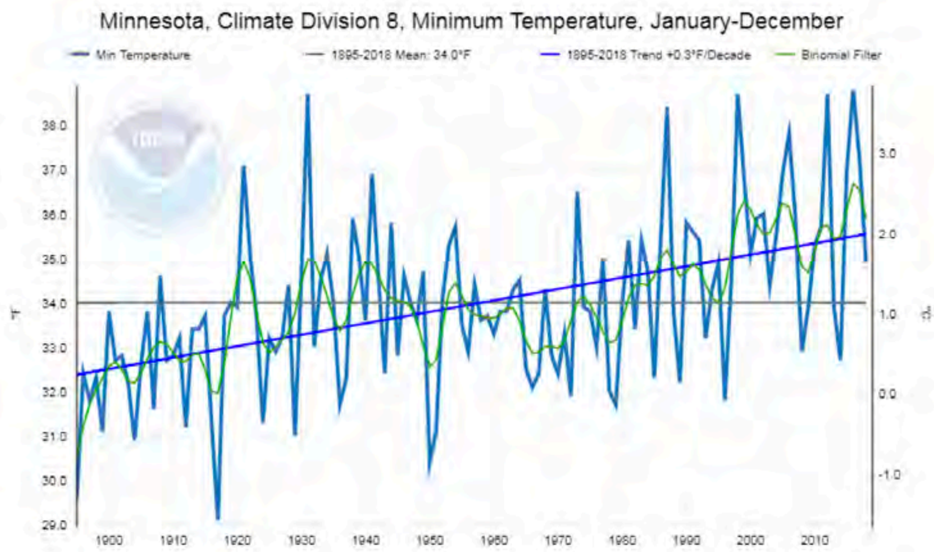


Figure 1-2. Minimum Annual Temperature for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

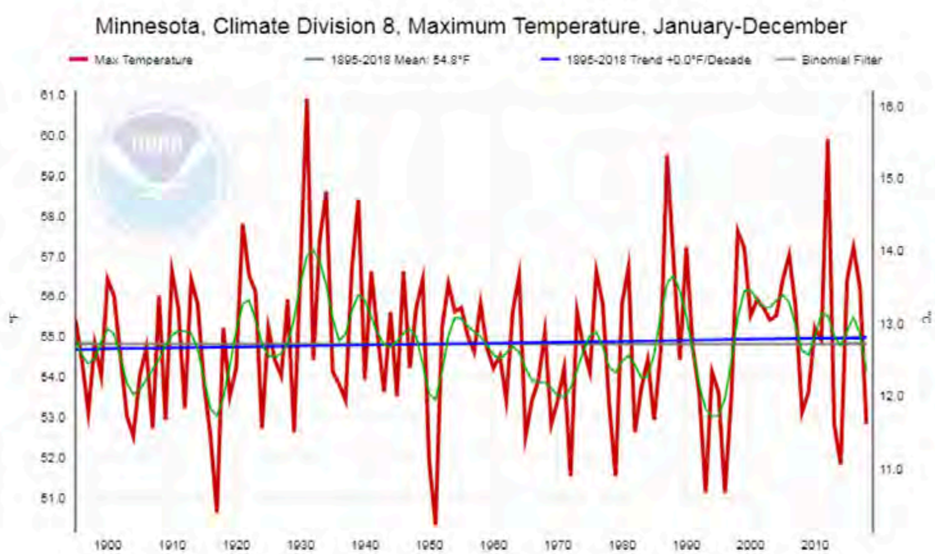


Figure 1-3. Maximum Annual Temperature for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

2

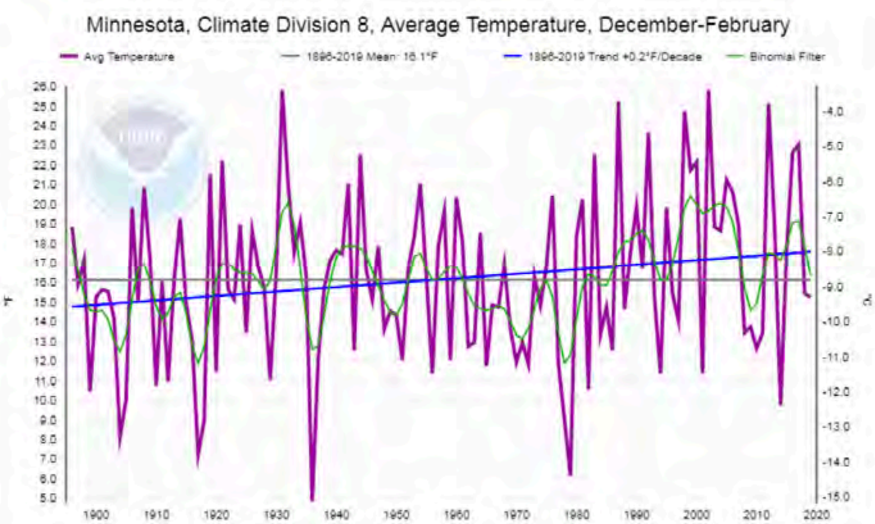


Figure 1-4. Three-Month Average Temperature (December – February) for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

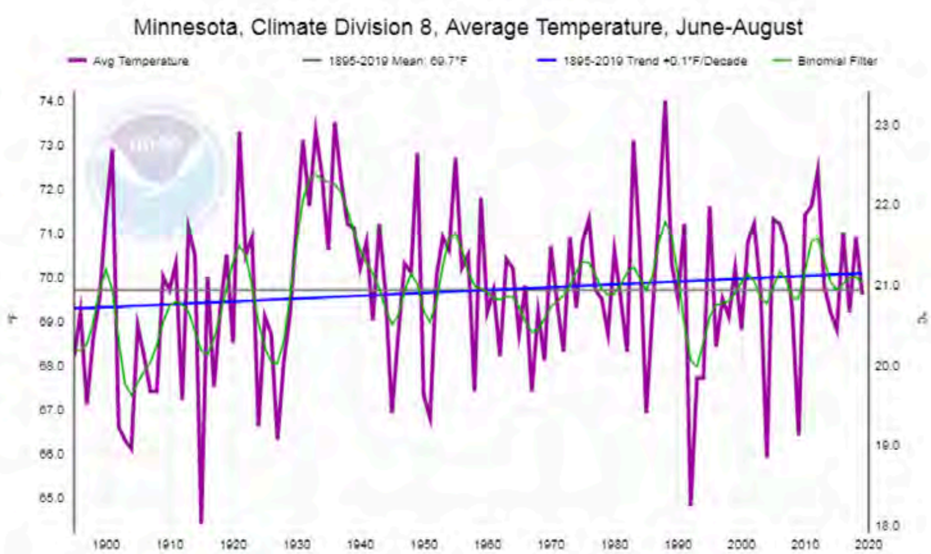


Figure 1-5. Three-Month Average Temperature (June - August) for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

3

1.2 PRECIPITATION DATA

Long-term annual precipitation data (1895 to 2018) were also obtained for Climate Division 6 [NOAA, 2019] and are shown in Figure 1-6. The mean annual precipitation for the period 1895 to 2018 was 29.59 inches and an annual precipitation increased by 0.43 inches per decade over the period. By smoothing the time series with a binomial filter, multi-year dry and wet periods are shown in the red line in Figure 1-6. Mean annual pan evaporation in the Sauk River Watershed is approximately 37 inches (Farnsworth and Thompson, 1982), which exceeds the mean annual precipitation by 7 inches.

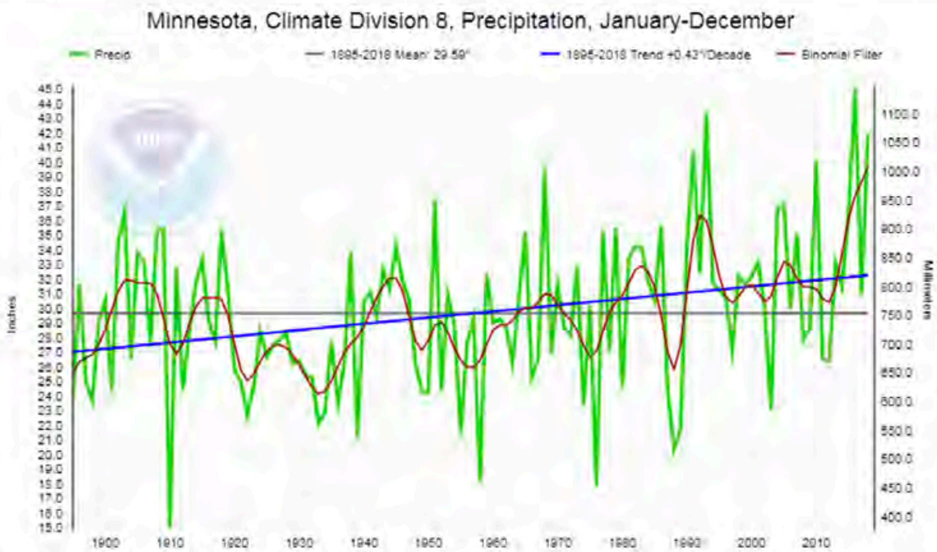


Figure 1-6. Annual Precipitation for 1895 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

1.3 MONTHLY AND SEASONAL TEMPERATURE AND PRECIPITATION

Mean monthly temperature and precipitation (monthly normals) from 1981 to 2010 were obtained from the Midwestern Regional Climate Center (MRCC) for Albert Lea, Minnesota (station USC00210075) and are shown in Figure 1-7. Mean monthly temperatures follow a sinusoidal pattern with peaks in the summer and lows in the winter. Average daily maximum temperature range from about 23^{0}F in January to just above 80^{0}F in July; mean daily minimum temperatures tend to be approximate 20^{0}F lower than mean daily maximum temperatures throughout the year. Mean monthly precipitation increases from February to June and remains high through September before dropping through the fall and winter.

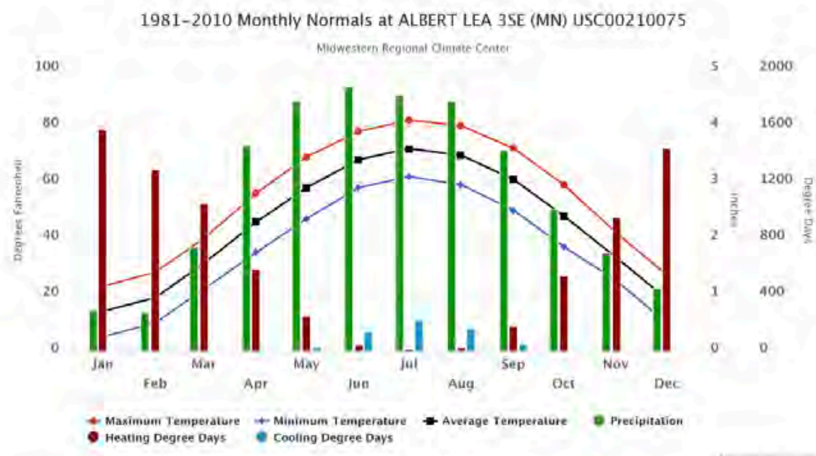


Figure 1-7. Monthly Climate Average Precipitation, Maximum, Mean, and Minimum Temperature for 1981 – 2010 from the Midwestern Regional Climate Center (2019).

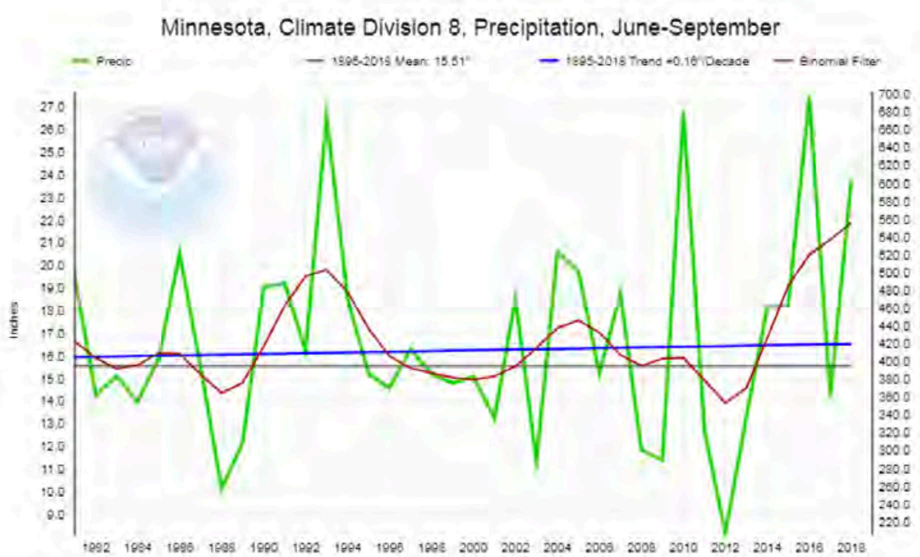


Figure 1-8. Growing Season Precipitation Trend for 1981 – 2018 from the Nation Oceanic and Atmospheric Administration (2019) Climate Division 8.

Mean growing season (June through September) precipitation has increased (+0.16 inches per decade) recently, as shown for the period 1981 to 2018 in Figure 1-8. Monthly precipitation values by year were obtained from the Minnesota Department of Natural Resources (DNR) Precipitation Data Retrieval from a Gridded Database [MDNR State Climatology, 2019] for Albert Lea, Minnesota and are shown in Table 1-1. Color-coding is used to show dry periods (precipitation less than the 30th percentile precipitation) in red and wet periods (greater than 70th percentile) in blue for each year, growing season, and growing season month. These data highlight the variability of wet and dry months during the growing season, but also show that the last six years have not had any dry (below 30th percentile) growing seasons and have tended to have more wet growing seasons than would be expected. Figure 1-9 shows the growing season and annual precipitation for 1981 to 2018 for Albert Lea, Minnesota. There is an increase in both annual precipitation (1.1 inches per decade) and growing season precipitation (1.2 inch per decade) over this time period.

Table 1-1. Monthly Precipitation by Year for Albert Lea, Minnesota (MDNR State Climatology, 2019).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.45	0.42	1.05	1.90	2.71	3.34	2.56	2.47	1.90	1.36	0.66	0.60	17.55	27.34	27.86
70%	1.13	1.00	1.99	3.43	4.87	5.64	5.17	4.51	4.30	2.94	1.94	1.28	22.51	34.25	34.16
mean	0.84	0.88	1.63	2.83	4.08	4.73	4.03	3.80	3.53	2.23	1.47	1.04	20.14	31.02	31.05
1981-2010 Normals															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
normal	0.76	0.75	1.77	3.47	4.22	4.77	4.69	4.45	3.57	2.46	1.69	1.11	21.70	33.72	33.62
Year-to-Year Data															
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
2018	1.14	1.07	1.16	2.96	5.77	7.99	5.22	3.35	8.16	3.70	1.65	1.12	30.49	43.29	42.84
2017	1.13	1.00	2.21	2.73	4.43	4.86	5.00	3.30	2.92	5.10	0.32	0.60	20.51	33.60	35.46
2016	0.51	0.55	3.01	2.15	3.49	5.26	7.55	4.78	10.93	4.87	1.43	1.58	32.01	46.11	45.06
2015	0.46	0.59	0.38	4.74	4.10	7.22	4.87	5.29	3.67	0.92	2.93	2.98	25.15	38.15	34.15
2014	1.15	1.08	1.74	5.64	2.00	9.89	0.75	6.28	3.23	1.51	0.80	0.52	22.15	34.59	36.90
2013	0.33	0.78	2.65	5.83	7.05	9.00	3.37	3.39	1.18	3.30	0.85	0.99	23.99	38.72	37.49
2012	0.78	1.68	1.44	3.12	4.33	2.63	1.74	1.73	1.37	1.54	0.56	1.81	11.80	22.73	21.45
2011	1.14	0.88	1.80	3.67	4.93	4.54	5.71	1.18	2.12	1.17	0.21	1.25	18.48	28.60	31.19
2010	0.58	0.99	1.54	1.57	2.22	6.96	6.02	2.11	9.39	0.75	2.08	2.39	26.70	36.60	40.99
2009	0.74	0.72	1.43	2.61	2.68	6.20	2.25	3.57	1.08	6.95	0.68	1.98	15.78	30.89	27.01
2008	0.54	0.59	0.99	4.40	4.54	5.72	3.87	2.29	1.42	2.00	2.65	1.08	17.84	30.09	29.43
2007	0.85	1.97	1.98	2.18	4.44	3.67	4.47	9.93	5.21	3.60	0.19	1.28	27.72	39.77	38.58
2006	0.34	0.76	2.80	7.73	2.12	3.81	1.98	6.35	4.10	0.66	1.86	1.36	18.36	33.87	34.66
2005	0.77	1.00	1.54	3.47	5.06	3.96	4.79	4.19	7.45	1.43	2.23	1.01	25.45	36.90	36.46
2004	0.27	1.41	2.23	2.43	6.86	3.42	8.45	5.62	8.58	2.02	1.40	0.81	32.93	43.50	41.48
2003	0.22	0.41	2.10	2.05	5.91	4.94	4.24	2.46	1.42	0.49	1.18	0.54	18.97	25.96	27.80
2002	0.60	0.70	1.25	3.30	2.00	3.90	6.93	5.42	2.42	3.41	0.19	0.45	20.67	30.57	30.75
2001	1.37	1.58	0.98	4.11	7.38	6.94	3.60	1.80	3.64	1.27	2.22	0.74	23.36	35.63	38.61
2000	1.16	1.04	0.84	0.89	7.75	7.72	4.06	4.41	1.01	1.91	3.37	1.93	24.95	36.09	31.22
1999	1.83	0.64	1.25	7.73	7.45	4.59	9.49	2.80	1.22	1.40	0.64	0.30	25.55	39.34	42.90
1998	1.15	0.83	2.30	2.88	3.76	7.84	2.55	6.64	2.17	5.19	0.55	0.16	22.96	36.02	32.99
1997	1.31	0.53	0.85	1.96	4.46	3.09	7.95	4.11	1.85	1.96	0.48	0.43	21.46	28.98	32.68
1996	1.81	0.07	1.51	1.34	3.16	5.20	1.30	4.61	2.57	3.01	2.59	0.97	16.84	28.14	25.90
1995	0.18	0.03	3.17	4.27	4.84	4.29	5.10	3.47	2.83	3.34	0.46	0.53	20.53	32.51	33.49
1994	1.06	0.82	0.16	2.70	2.46	4.97	6.34	3.38	3.87	3.52	1.11	0.68	21.02	31.07	28.65
1993	1.27	0.84	2.26	5.52	6.19	9.03	7.79	10.31	3.72	0.61	1.25	1.03	37.04	49.82	54.28
1992	1.13	0.63	2.63	2.54	2.17	2.83	5.53	3.68	3.01	2.52	3.25	1.58	17.22	31.50	31.76
1991	0.69	0.29	2.74	6.68	6.28	3.47	5.26	4.54	3.33	1.41	4.32	1.88	22.88	40.89	36.80
1990	0.29	0.49	3.97	4.94	4.14	5.57	6.81	4.00	0.60	1.60	0.42	1.50	21.12	34.33	32.71
1989	0.25	0.32	1.72	3.00	1.37	2.89	3.70	4.06	2.34	1.03	0.70	0.17	14.36	21.55	23.91
1988	0.69	0.33	0.62	2.90	1.64	1.67	1.30	4.24	5.77	0.61	2.58	1.07	14.62	23.42	24.33
1987	0.25	0.42	0.98	1.28	2.23	3.29	5.41	3.75	2.41	1.59	1.98	1.60	17.09	25.19	25.19
1986	0.24	0.11	2.16	4.58	5.05	5.06	5.01	4.20	4.51	3.83	1.05	0.29	23.83	36.09	35.22
1985	0.73	0.20	2.28	2.99	1.84	3.23	1.82	4.48	7.05	1.45	1.66	1.19	18.42	28.92	34.66
1984	0.28	1.82	1.07	5.40	3.81	5.34	4.62	1.32	1.89	6.53	1.93	1.58	16.98	35.59	33.20
1983	0.61	1.03	3.19	2.60	3.13	4.75	1.52	2.80	5.34	3.39	3.19	1.07	17.54	32.62	34.85
1982	1.61	0.40	1.56	2.27	8.33	2.57	2.62	6.67	5.63	3.69	3.25	2.94	25.82	41.54	36.50
1981	0.12	1.47	0.87	3.92	3.36	6.28	5.81	6.25	1.34	2.70	1.32	0.82	23.04	34.26	31.59

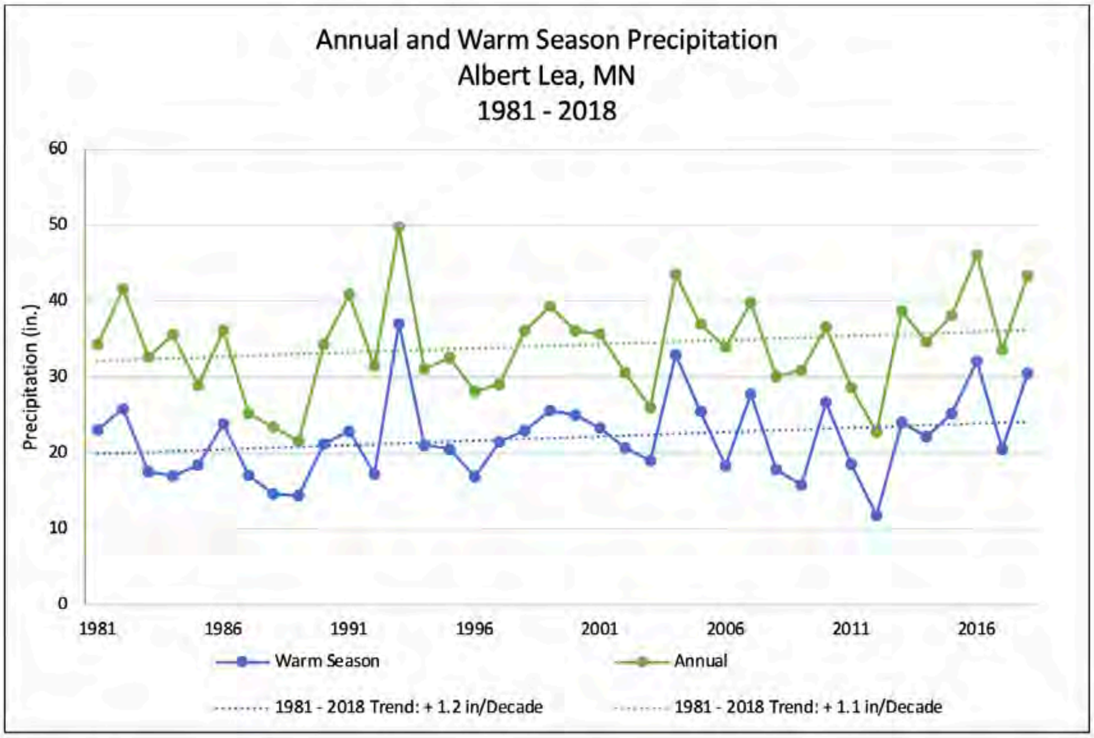


Figure 1-9. Annual and Warm Season Precipitation for 1981 – 2018 from MDNR's Precipitation Data Retrieval from a Gridded Database (2019).

1.4 LAKE ICE OUT EVENTS

Lake ice out data were obtained from MNDNR [2019] for Fountain Lake for the period 1912 to 2019. Ice out dates were converted to ordinal day (days since beginning of each year) to determine a trend over the period of record. In years with multiple ice out dates reported, an average of all dates was used; results are shown by year for Fountain Lake in Figure 1-10. Results show that the mean ice out date is trending later by about 1.6 days per centruy.

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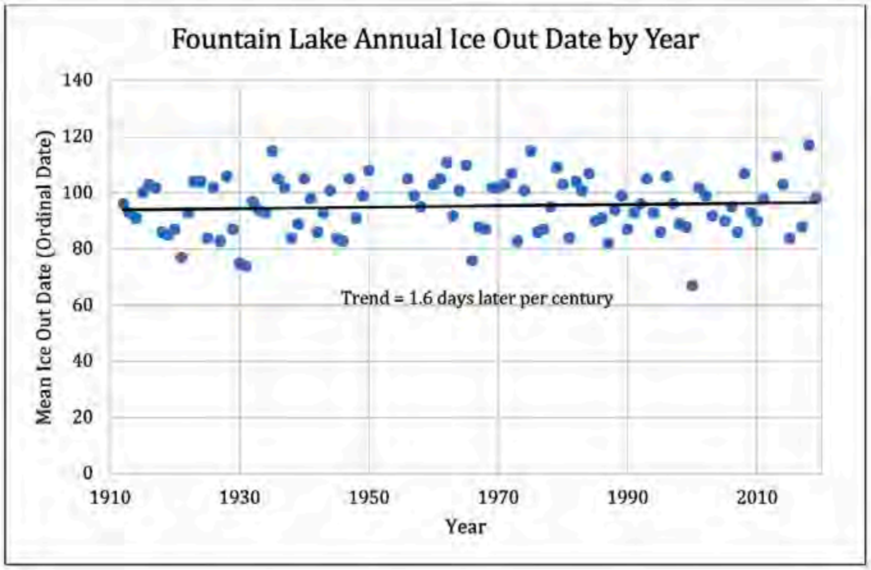

Figure 1-10. Mille Lacs Lake Annual Ice Out Ordinal Date by Year

1.5 EXTREME PRECIPITATION EVENTS

Historically, rainfall depths from Technical Paper No. 40 (TP-40) [Hershfield, 1961] have been used for precipitation-duration-frequency estimates for the purposes of engineering design. NOAA recently published Atlas 14 Volume 8 for Minnesota, which provides updated precipitation-duration-frequency estimates based on higher gridded resolution (scale of 1 km), incorporation of geographic features, 50 years more data than TP-40, and data from more weather stations. A comparison of TP-40 and Atlas 14 24-hour rainfall depths for Albert Lea, MN is given in Table 1-2 for recurrence intervals ranging from 2 years to 100 years. Rainfall depths are relatively unchanged for high frequency (2- to 10-year) events. For recurrence intervals of 50 to 100 years, Atlas 14 rainfall depths are 20 and 26 percent higher than TP-40 rainfall depths, respectively. Atlas 14 rainfall depths should be utilized in the future to ensure that BMPs are designed based on the most up-to-date information to provide the appropriate level of protection.

Table 1-2. Comparison of Technical Paper No. 40 (1961) to Atlas 14 (2013) for Albert Lea, MN.

Comparing TP-40 to Atlas 14 (24 hour storms) Albert Lea, MN			
Recurrence Intervals (Years)	TP 40 [in]*	Atlas 14 [in]	Percent Change
2	2.95	3	1.7
5	3.75	3.81	1.6
10	4.4	4.56	3.6
50	5.6	6.73	20.2
100	6.2	7.81	26.0
*Interpolated values from isopleths			

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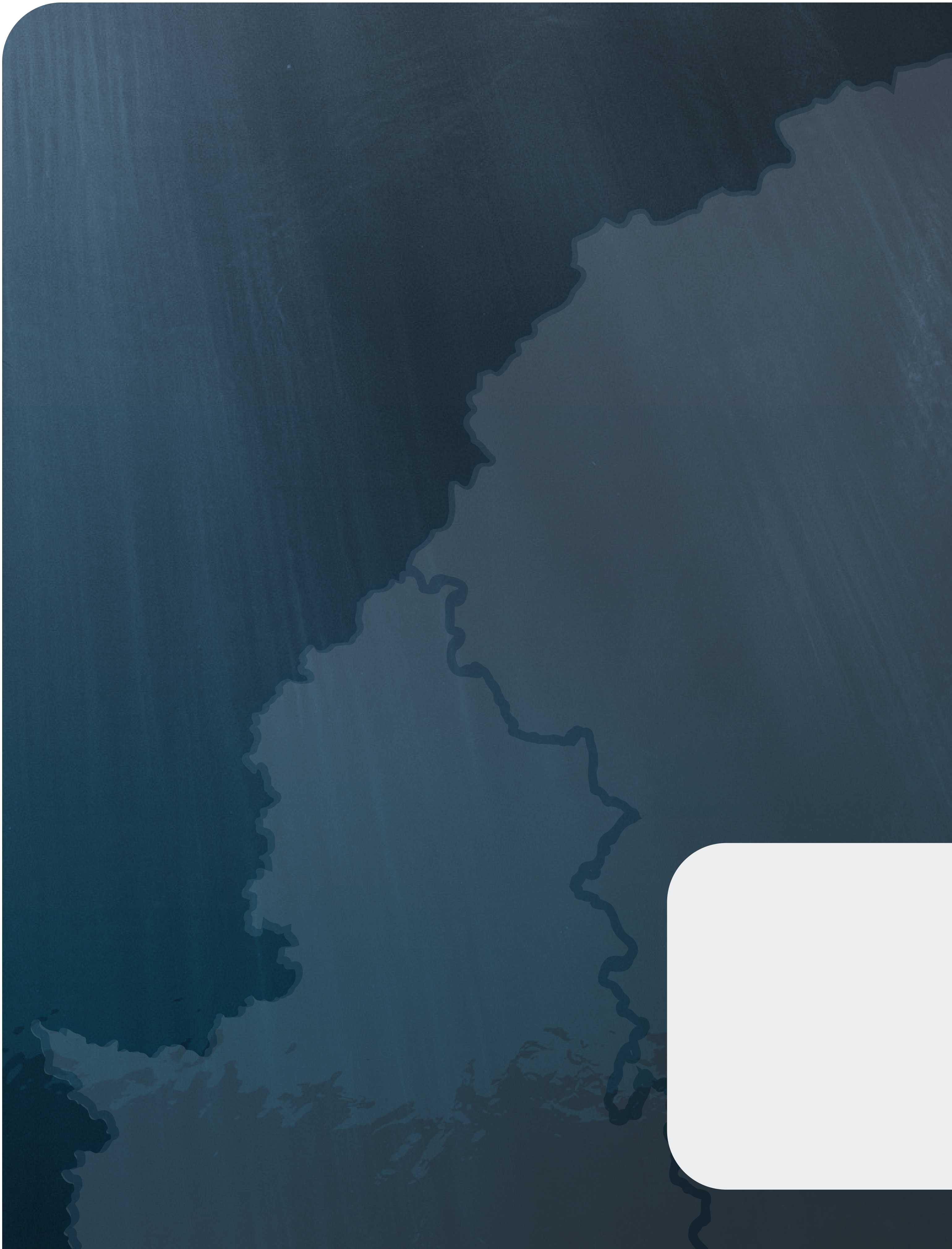

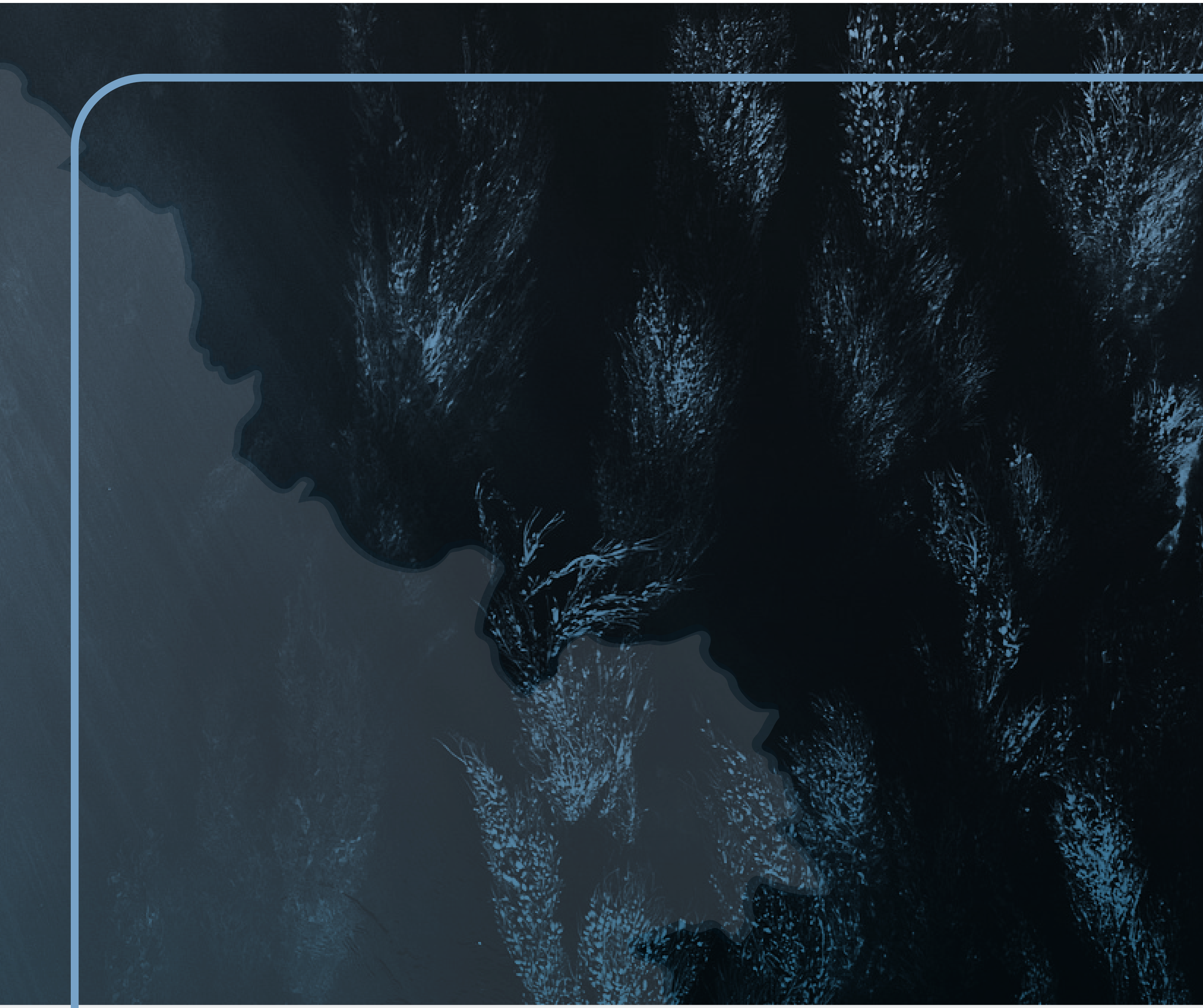

APPENDIX G
SPREADSHEET TARGETING TOOL MEMO

EXTERNAL MEMORANDUM

To: Ms. Emily Zanon
Watershed Project Manager
Minnesota Pollution Control Agency
18 Woodlake Dr.
Rochester, MN 55904

cc: Project Central File 2428 — Category A

From: Mr. Seth Kenner
Staff Engineer
RESPEC
P.O. Box 725
Rapid City, SD 57709

Date: October 13, 2020

Subject: Shell Rock River/Winnebago River Best Management Practice Targeting Methodology

This technical memorandum summarizes work done by RESPEC to target the most beneficial and cost-effective locations to place best management practices (BMPs) throughout the Shell Rock River and Winnebago River Watersheds. This project was based on Hydrologic Simulation Program – FORTRAN (HSPF) Scenario Application Manager (SAM) (hereafter referred to as SAM) loads further targeted in mile sections using the raster-based Revised Universal Soil Loss Equation (RUSLE) and nutrient-loading calculations.

OVERVIEW

The large-scale HSPF model applications for the Shell Rock River and Winnebago River Watersheds developed for the Minnesota Pollution Control Agency (MPCA) represent uniform loading rates for each land cover within each Hydrologic Unit Code (HUC) 14 (Minnesota Department of Natural Resources [MNDNR] Level 7). At the HUC 8-scale and given the available observed data, this resolution is adequate for effectively representing the predominant sources and general locations of the contributing nutrient and sediment loads. However, within each HUC 14, significant variations in watershed characteristics that may not be captured by the watershed scale models can occur. The targeting tool will help watershed managers to identify areas for implementation at a higher resolution.

METHODOLOGY

The first step for targeting higher nutrient- and sediment-loading areas was to choose the most appropriate targeting polygons. RESPEC determined that because of the resolution of

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the tillage information available, polygons at the Public Land Survey System (PLSS) square-mile level would be ideal for this project. PLSS square-mile polygons were intersected with the HSPF subwatershed and given IDs (Poly_SubIDs) based on county, township, section, range, and subwatershed. Poly_SubID polygons are shown in Figure 1. A set of map keys with Poly_SubID values is included in Attachment A. The second step was to perform the RUSLE raster calculations and the nutrient-loading raster calculations.

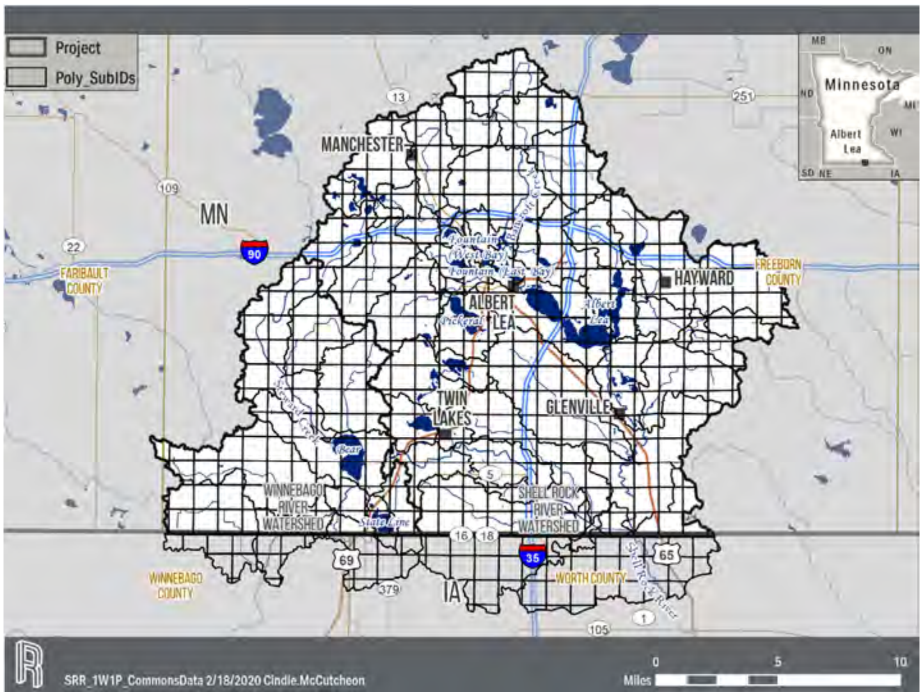

Figure 1. Polygons Used for Shell Rock River/Winnebago River Best Management Practice Targeting.

The HSPF-SAM targeting methodology focuses on analyzing the water quality impact of establishing cover crops, no-till, and/or Water and Sediment Control Basins (WASCOBs) on row crops in the corn and soybean rotation. All of the cropland was assumed to be in this rotation because in this area the corn and soybeans make up approximately 99 percent of crops planted. The HSPF modeled loads are calibrated to instream observed flow and water quality, which provide better estimates at a larger scale. These more accurate large-scale HSPF cropland loads were distributed to cropland in each Poly_SubID by calculating the percent of the total high-resolution load on the cropland in each Poly_SubID.

Current sediment loads were estimated using the same spatial datasets and the RUSLE. Current total nitrogen loads were estimated spatially based on the Lazarus methodology [Lazarus, 2018] and used elevation (i.e., slope), crop type, soil, and county spatial datasets. Current total phosphorus loads were estimated as a function of the nitrogen and sediment loads.

ESTIMATION OF SEDIMENT LOADING

The higher-resolution sediment loading was estimated using the RUSLE. The RUSLE [Renard et al., 1997] is an empirical erosion prediction equation that can be used to estimate the long-term mean annual soil loss from several variables. RUSLE is given as:

$$A = RKLSCP \tag{1}$$

where A is the long-term mean annual soil loss (imperial tons per acre), R is the rainfall-runoff erosivity factor (hundreds of foot-ton-inches per acre per hour), K is the soil erodibility factor (ton-acre-hours per hundred foot-tons per inch), L is the slope length factor, S is the slope steepness factor, C is the cover-management factor, and P is the support practice factor. Factors L and S are often considered as a single factor LS, which is referred to as the combined length-slope factor. Separate rasters were developed for each of the five components and soil loss (A) was determined as the product of those layers. The following sections detail how each layer used in the RUSLE calculation was developed.

R FACTOR

R, the rainfall-runoff erosivity factor, captures the effect of rainfall-runoff processes, storm intensity, and total storm energy. Both event-specific and mean annual R values are available from various sources. For estimating mean annual erosion, a raster of R values was calculated using Equation 2 for the Eastern United States [Cooper, 2011]:

$$R = 1.24P^{1.36} \tag{2}$$

where:

P = Mean annual precipitation (in)

R = Rainfall erosivity factor.

K FACTOR

The soil erodibility factor, K, represents a soil's susceptibility to erosion by rainfall and runoff processes. K values that correspond to the map unit key (mukey) values in the Gridded Soil Survey Geographic database (gSSURGO) were used to create a K-value raster.

LS FACTOR

The combined length-slope factor, LS, represents the effects of terrain and hydrology on soil loss. LS is the product of the original terms L (the slope-length factor) and S (the slope-steepness factor). LS values were estimated by using the relationships shown in Equations 3 and 4, adapted from Moore and Wilson [1992], Jain and Kothyari [2000], and Breiby [2006]:

$$LS = \left(m+1\right)\left(\frac{A_s}{22.13}\right)^m\left(\frac{\sin\beta}{0.0896}\right)^n \tag{3}$$

where A_s is the specific catchment area with units as m (the units for area are square meters [m^2] divided by flow-path width [m]), β is the slope in degrees, m is 0.4, and n is 1.3, with the m and n

exponents relating to the characteristics of erosion in the watershed based on the relative prevalence of rill and inter-rill erosion.

$$A_s = \frac{FA \times \text{Cell Area}}{\text{Cell Size}} = \frac{FA \times (\text{Cell Size})^2}{\text{Cell Size}} = FA \times \text{Cell Size} \quad (4)$$

where FA is the flow accumulation, which is the number of gridcells upstream of a given gridcell; Cell Area is the area of each gridcell; and Cell Size is the edge length of a raster cell (i.e., 9 m for a 9- × 9-m grid). Equation 4 assumes that the flow-path width is equal to the Cell Size. A maximum value of flow accumulation of 0.001 times the maximum (gridcells) was used to determine which flow paths were stream channels/open water. Values above the maximum flow accumulation were set to the maximum value.

C FACTOR

C, the land-use factor, represents the effect of land use on soil loss. C values (Table 1) were developed for each of the National Land Cover Database (NLCD) land uses present in Minnesota and were tabulated from Panagos et al. [2015], Doucet-Beer [2012], and Yoo et al. [2013].

Table 1. Costs for Best Management Practices Included in Targeting Tool

Land Cover	Code	C(a)	C(b)	C(c)	Value Used	Source
Open Water	11	0	0	0	0	C(c)
Developed, Open Space	21	—	0.003	0.003	0.003	C(c)
Developed, Low Intensity	22	—	0	0.001	0.001	C(c)
Developed, Medium Intensity	23	—	0	0.001	0.001	C(c)
Developed, High Intensity	24	—	0	0	0	C(b)
Barren Land	31	0.1–0.45	0.3	0.7	0.7	C(c)
Deciduous Forest	41	0.0001–0.003	0.002	—	0.002	C(b)
Evergreen Forest	42	0.0001–0.003	—	0.0001	0.002	C(b), Deciduous Forest
Mixed Forest	43	0.0001–0.003	—	—	0.002	C(b), Deciduous Forest
Shrub/Scrub	52	0.01–0.1	—	0.038	0.038	C(c)
Grasslands/Herbaceous	71	0.01–0.08	0.005	0.042	0.042	C(c)
Pasture/Hay	81	0.05–0.15	0.05	0.1	0.1	C(c)
Cultivated Crops	82	0.07–0.35	—	0.24	0.24	C(c)
Woody Wetlands	90	—	0.001	0.003	0.003	C(c)
Emergent Herbaceous Wetlands	95	—	0.001	0.003	0.003	C(c)

(a) Panagos et al. [2015]
(b) Doucet-Beer [2011]
(c) Yoo et al. [2013].

P FACTOR

P, the support practice factor, represents the effect of land management on soil loss. The P value for the area was set equal to 1.

RUSLE RESULTS

Mean annual erosion values were calculated as the product of raster layers R, K, LS, C, and P. Zonal statistics were calculated on the resulting RUSLE raster to determine the expected gross soil erosion from the cropland within each Poly_SubID. Mean erosion rates (tons per acre per year [tons/ac/yr]) on cropland in each Poly_SubID range from less than zero to 82, with an average value of 5.1 tons/ac/yr. Figure 2 shows RUSLE calculation results on cropland throughout the project area.

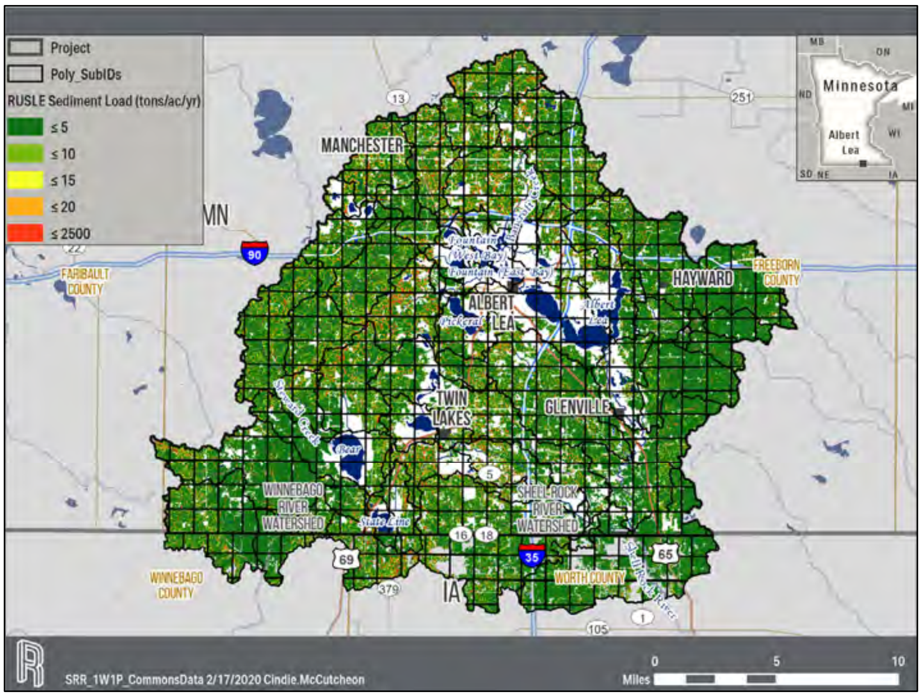

Figure 2. Sediment-Loading Rate on Cropland in the Project Area Calculated Using Revised Universal Soil Loss Equation.

ESTIMATION OF NUTRIENT LOADING

The methodology to estimate nutrient loads at a finer scale was based on regression equations from the spreadsheet tool developed by Bill Lazarus [Lazarus and Keller, 2018]. These loads were calculated using the methodology outlined in Chapter D4 of the MPCA's [2013] report *Nitrogen in Minnesota Surface Waters* using the following spatial datasets: the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL), gSSURGO soil surveys, slope from a digital elevation model (DEM), and county boundaries [Mulla et al., 2012]. The loads were developed as a 30- × 30-m grid. Zonal statistics were performed on the resulting raster to determine the expected nitrogen loads from the cropland within each Poly_SubID. Mean loading rates (pounds per acre per year [lbs/ac/yr]) on cropland in each

Poly_SubID range from less than 1 to 22.4 with an average value of 13.8 lbs/ac/yr. Figure 3 shows nitrogen calculation results on cropland throughout the project area.

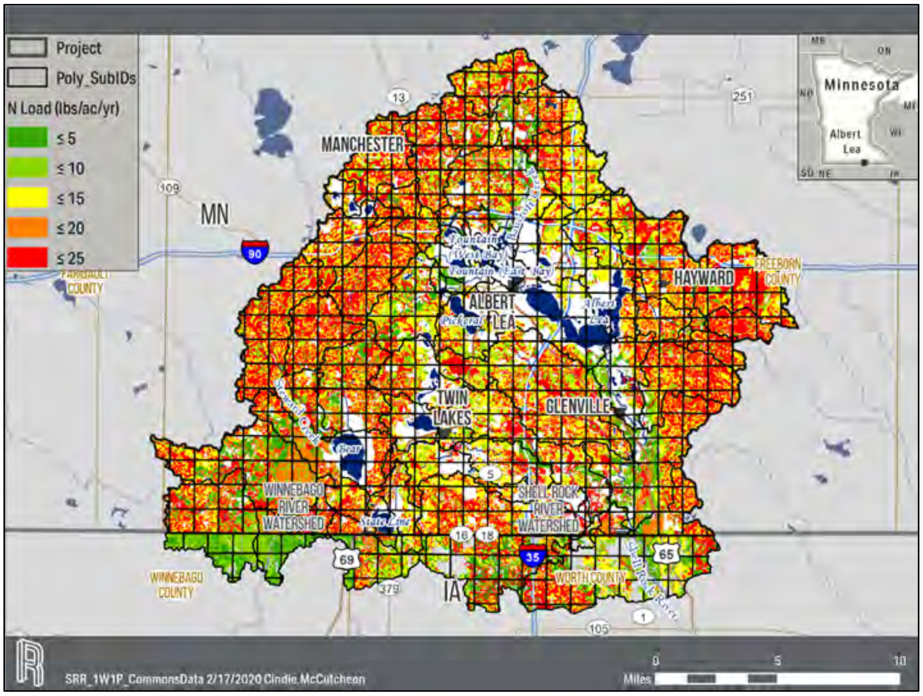

Figure 3. Nitrogen-Loading Rate on Cropland in the Project Area Calculated Using the Lazarus Methodology.

The spatial nitrogen loads were calculated to represent the loads as if the corn and soybean rotation was present in each grid cell. The nutrient loads for assuming cover crops were being planted were also calculated as a grid using the same methodology but different regression equations. This method allowed for a high-resolution representation of cover-crop reductions on cropland in each Poly_SubID. Mean loading rates for corn-soybean rotations with cover crops ranged from less than 1 to 12.8 lbs/ac/yr with an average value of 7.6 lbs/ac/yr.

TARGETING SPREADSHEET TOOL

The Targeting Spreadsheet Tool allows the user to specify the fraction of cropland each practice will be applied to in each Poly_SubID. The tool uses a treatment train applying cover crops first, followed by conservation tillage, followed by wetland restoration to each area. The fraction is entered in the "Scenario Builder" tab under "BMP Selection" with "CC" for cover crops, "Till" for conservation tillage, or "TWR" for wetland restoration.

BMP prioritization is based on the cost of pollutant removal and, as such, developing estimates of both the pollutant removed and cost of BMP construction is necessary. BMP construction costs were adapted from construction costs in HSPF-SAM, which were adapted from Minnesota Environmental

Quality Incentive Program (EQIP) payment rates. BMP costs are included in Table 2. Costs can be edited in the Targeting Spreadsheet Tool in the “Info” tab. BMP removal rates were based on values in SAM and the *Agricultural BMP Handbook for Minnesota 2017* [Lenhart and Peterson]. BMP efficiency factors are summarized in Table 3. Efficiency factors can be edited in the Targeting Spreadsheet Tool in the “Info” tab.

Table 2. Costs for Best Management Practices Included in the Targeting Tool

Practice	Cost ($/ac/yr)
Cover Crop	37.98
No-Till	11.03
Restored Wetlands	31.64

ac = acres
yr = year.

Table 3. Uniform Base Reduction Efficiencies for Best Management Practices Included in the Targeting Tool

Cropland Type	Parameter	Cover Crop (%)	No-Till (%)	Restored Wetlands (%)
Tile Drained	TSS	69	74	70
	TN	28	28	47
	TP	24	58	42
Not Tile Drained	TSS	74	80	70
	TN	28	32	47
	TP	27	65	42

TSS = Total Suspended Solids
TN = Total Nitrogen
TP = Total Phosphorus.

The Targeting Spreadsheet Tool also allows the user to view load reduction in any local Poly_SubID, as well as the fate of the pollutant to any reach specified in cell M5 of the “Scenario Builder” tab as the “Select Reach of Interest.” Fate can be looked up in the tool using a set of fate matrices for TSS, TN, and TP developed from SAM.

The last option for the user in the Targeting Spreadsheet Tool is to select whether the tool uses nitrogen reductions for the cover crop practice from the Table 3 efficiency factors or efficiencies from Lazarus method targeted reductions [Lazarus, 2018]. This specification is selected in the “Info” tab cell B2 dropdown as “Efficiency” or “Targeted Loading.”

Once the user selections are made in the Targeting Spreadsheet Tool, the local and specified reach reductions can be sorted to find the Poly_SubID locations with the highest reductions of a pollutant per acre or the most cost-effectiveness in columns BX through CU. The tool also generates a “Progress

Summary" in the top-left side of the "Scenario Builder" tab that summarizes the total cost for selected BMPs in all of the Poly_SubIDs; expected local and specified reductions of TP, TN, and TSS; and cost effectiveness.

TARGETING SCENARIO DEVELOPMENT IN SAM

Poly_SubIDs were prioritized using the Targeting Spreadsheet Tool to run the following set of scenarios in SAM with targeted efficiencies:

1. Conservation tillage on 30 percent of cropland
2. Fall cover crops on 15 percent of cropland
3. Fall cover crops on 30 percent of cropland
4. Conservation tillage on 30 percent + fall cover crops on 50 percent
5. Increase water storage by 10 percent.

Outside of the Targeting Spreadsheet Tool, a 30 percent internal loading reduction in all of the modeled lakes was represented in SAM as Scenario 6.

For each modeled subwatershed, the acres required to meet the scenarios listed above in the Poly_SubID areas with the most effective reductions were entered into a set of SAM scenarios along with the adjusted costs and efficiency factors from the Targeting Spreadsheet Tool. Figure 4 shows locations for SAM scenario results. Table 4 shows the SAM scenario results (percent reduction) for the set of scenarios using the original SAM efficiency factors compared to the targeted SAM efficiency factors at five primary locations throughout the project area. The "Increase Water Storage" scenario is expected to have a larger impact in SAM than just the efficiency factors shown because this scenario reduces flows and, therefore, will lower bed and bank scour. There are numerous metrics in the tool that can be used to develop a targeted scenario using any of the modeled reaches as a location of concern. The scenario results presented in Table 4 were developed using a comprehensive targeting approach that looks at the effect of all the parameters at all the locations in the table. If a specific parameter and location are targeted using the Targeting Spreadsheet Tool it is likely that the reductions and effectiveness will be even more improved when compared to the base SAM scenarios.

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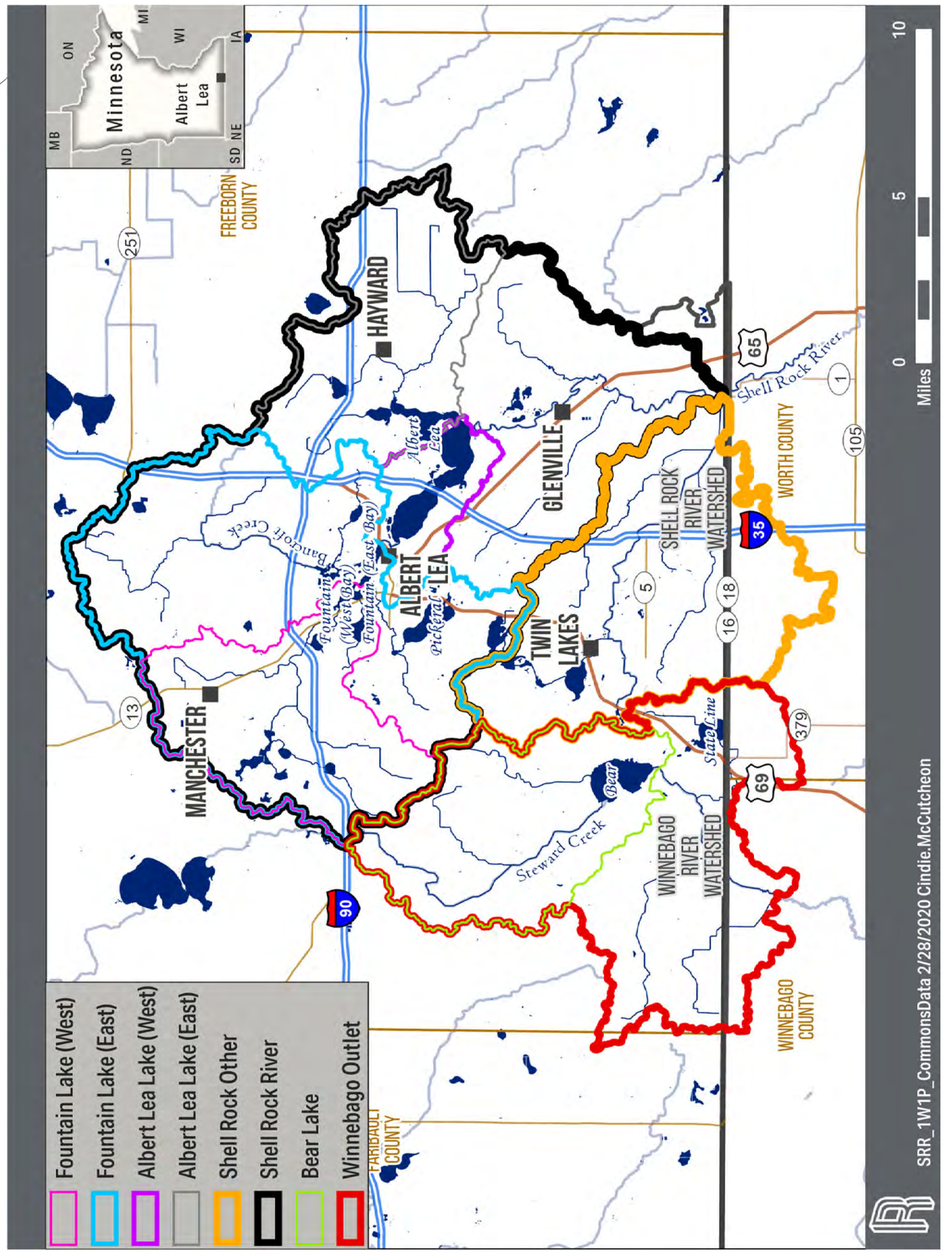

Figure 4. Areas Draining to Main Points of Interest.

Table 4. Percent Reductions of Total Suspended Solids, Total Nitrogen, and Total Phosphorus for Alternative Crop Scenarios Output From SAM Using Supplied Efficiency Factors and Applied Uniformly to a Subwatershed in Each Minor Watershed in the Project Area (Page 1 of 3)

Scenario	Watershed	Reach I.D.	Uniform Reductions (%)			Targeted Reductions (%)		
			Total Suspended Solids	Total Nitrogen	Total Phosphorus	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Scenario 1: Conservation Tillage on 30% of Cropland	Fountain Lake West	80	17	10	16	24	14	23
	Fountain Lake East	120	18	11	15	21	12	19
	Albert Lea Lake West	140	16	12	10	19	13	11
	Albert Lea Lake East	148	17	12	15	21	12	15
	Shell Rock River	190	16	10	6	19	11	7
	Shell Rock Other Area	213	20	9	17	24	12	22
	Bear Lake	260	20	10	15	28	11	17
	Winne Outlet	310	19	9	16	26	12	20
Scenario 2: Fall Cover Crops on 15% of Cropland	Fountain Lake West	80	8	4	3	10	7	6
	Fountain Lake East	120	8	4	3	11	8	6
	Albert Lea Lake West	140	7	4	2	10	9	3
	Albert Lea Lake East	148	8	4	3	11	7	4
	Shell Rock River	190	7	4	1	9	7	2
	Shell Rock Other Area	213	9	4	3	12	9	7
	Bear Lake	260	9	4	3	15	8	5
	Winne Outlet	310	9	4	3	14	10	7
Scenario 3: Fall Cover Crops on 30% of Cropland	Fountain Lake West	80	16	8	7	18	14	11
	Fountain Lake East	120	16	8	6	20	15	11
	Albert Lea Lake West	140	14	8	4	18	16	5

Table 4. Percent Reductions of Total Suspended Solids, Total Nitrogen, and Total Phosphorus for Alternative Crop Scenarios Output From SAM Using Supplied Efficiency Factors and Applied Uniformly to a Subwatershed in Each Minor Watershed in the Project Area (Page 2 of 3)

Scenario	Watershed	Reach I.D.	Uniform Reductions (%)			Targeted Reductions (%)		
			Total Suspended Solids	Total Nitrogen	Total Phosphorus	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Scenario 3: Fall Cover Crops on 30% of Cropland (continued)	Albert Lea Lake East	148	16	9	6	20	14	9
	Shell Rock River	190	15	7	2	17	14	4
	Shell Rock Other Area	213	18	8	7	21	16	13
	Bear Lake	260	19	8	6	26	15	10
	Winne Outlet	310	18	8	7	26	18	13
Scenario 4: Conservation Tillage on 30% and Fall Cover Crops on 50% of Cropland	Fountain Lake West	80	38	23	25	42	38	37
	Fountain Lake East	120	39	23	24	38	33	31
	Albert Lea Lake West	140	34	24	14	33	34	16
	Albert Lea Lake East	148	38	25	22	37	31	24
	Shell Rock River	190	35	21	9	33	28	11
	Shell Rock Other Area	213	43	20	26	41	32	35
	Bear Lake	260	44	22	22	47	29	25
	Winne Outlet	310	42	21	25	45	33	32
Scenario 5: Increase Water Storage on 10% of Cropland	Fountain Lake West	80	1	1	1	8	8	6
	Fountain Lake East	120	1	0	0	6	5	4
	Albert Lea Lake West	140	1	1	1	5	6	3
	Albert Lea Lake East	148	2	1	1	6	5	3
	Shell Rock River	190	1	1	0	5	5	1
	Shell Rock Other Area	213	1	0	1	6	5	5
	Bear Lake	260	1	0	0	7	5	3
	Winne Outlet	310	1	0	1	7	5	4

Table 4. Percent Reductions of Total Suspended Solids, Total Nitrogen, and Total Phosphorus for Alternative Crop Scenarios Output From SAM Using Supplied Efficiency Factors and Applied Uniformly to a Subwatershed in Each Minor Watershed in the Project Area (Page 3 of 3)

Scenario	Watershed	Reach I.D.	Uniform Reductions (%)			Targeted Reductions (%)		
			Total Suspended Solids	Total Nitrogen	Total Phosphorus	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Scenario 6: 30% Internal Loading Reduction in Lakes	Fountain Lake West	80	0	1	2	NA	NA	NA
	Fountain Lake East	120	0	1	3	NA	NA	NA
	Albert Lea Lake West	140	0	2	13	NA	NA	NA
	Albert Lea Lake East	148	0	1	8	NA	NA	NA
	Shell Rock River	190	0	1	3	NA	NA	NA
	Shell Rock Other Area	213	0	0	1	NA	NA	NA
	Bear Lake	260	0	2	3	NA	NA	NA
	Winne Outlet	310	0	1	1	NA	NA	NA

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Enclosure

ATTACHMENT A

POLY_SUBID REFERENCE MAPS

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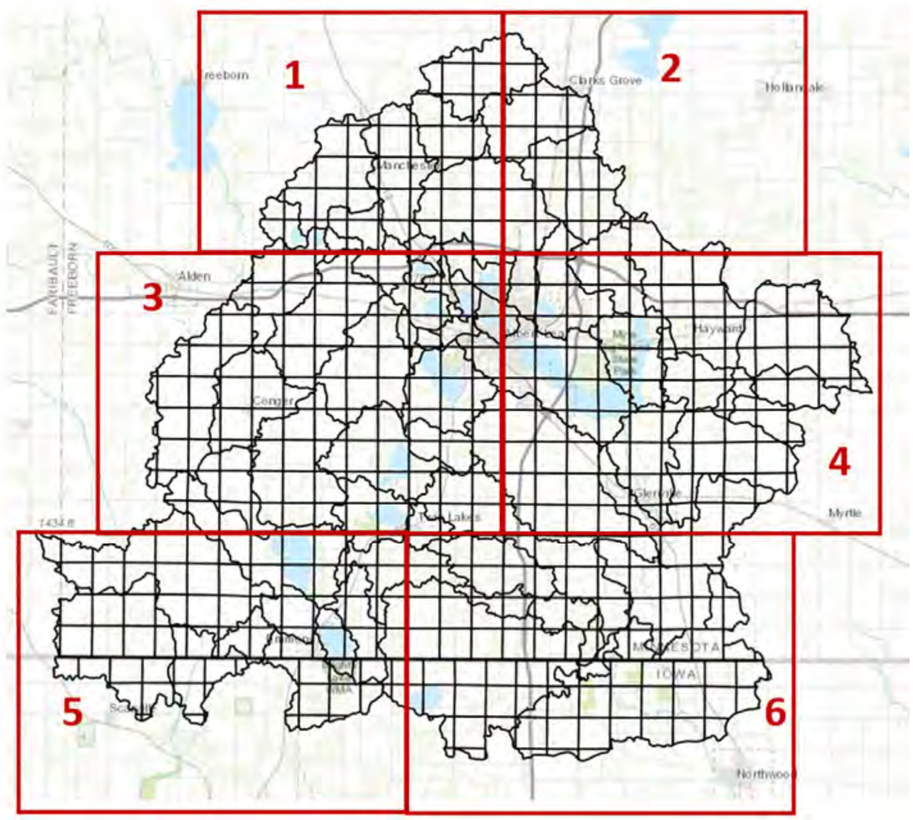

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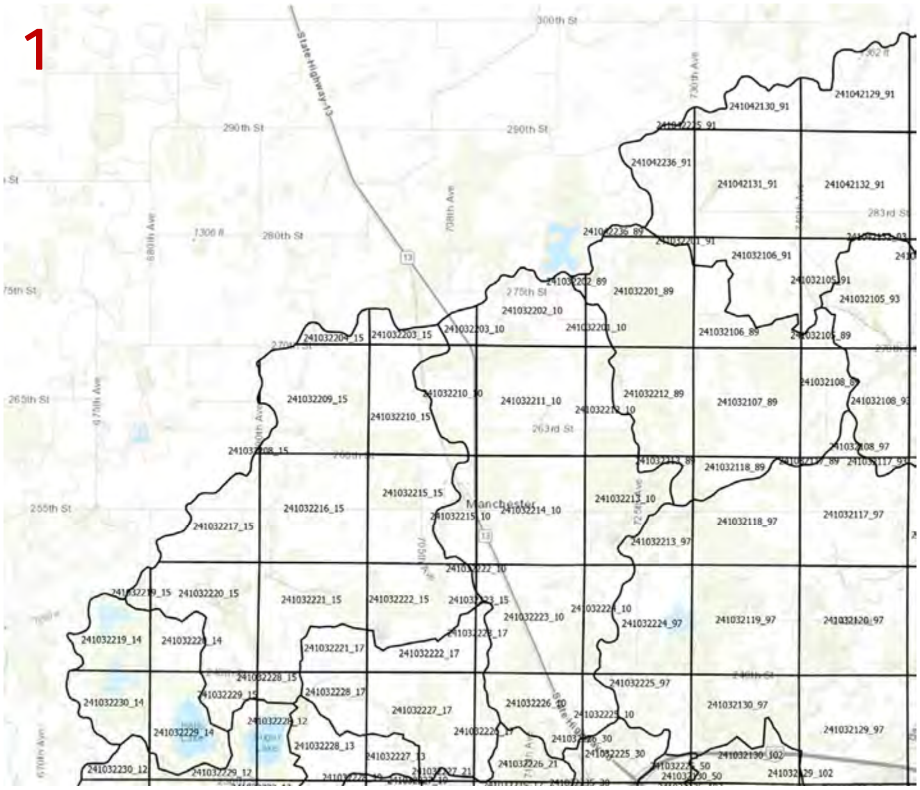

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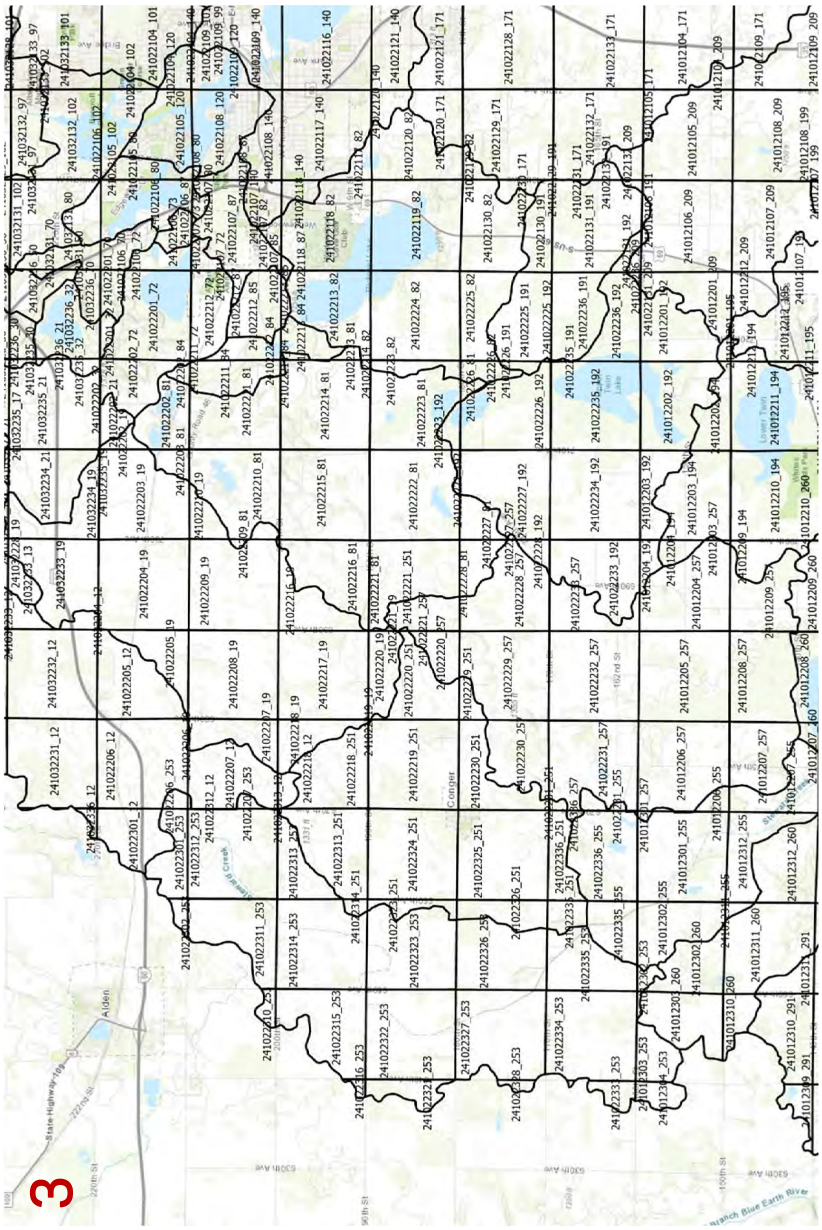

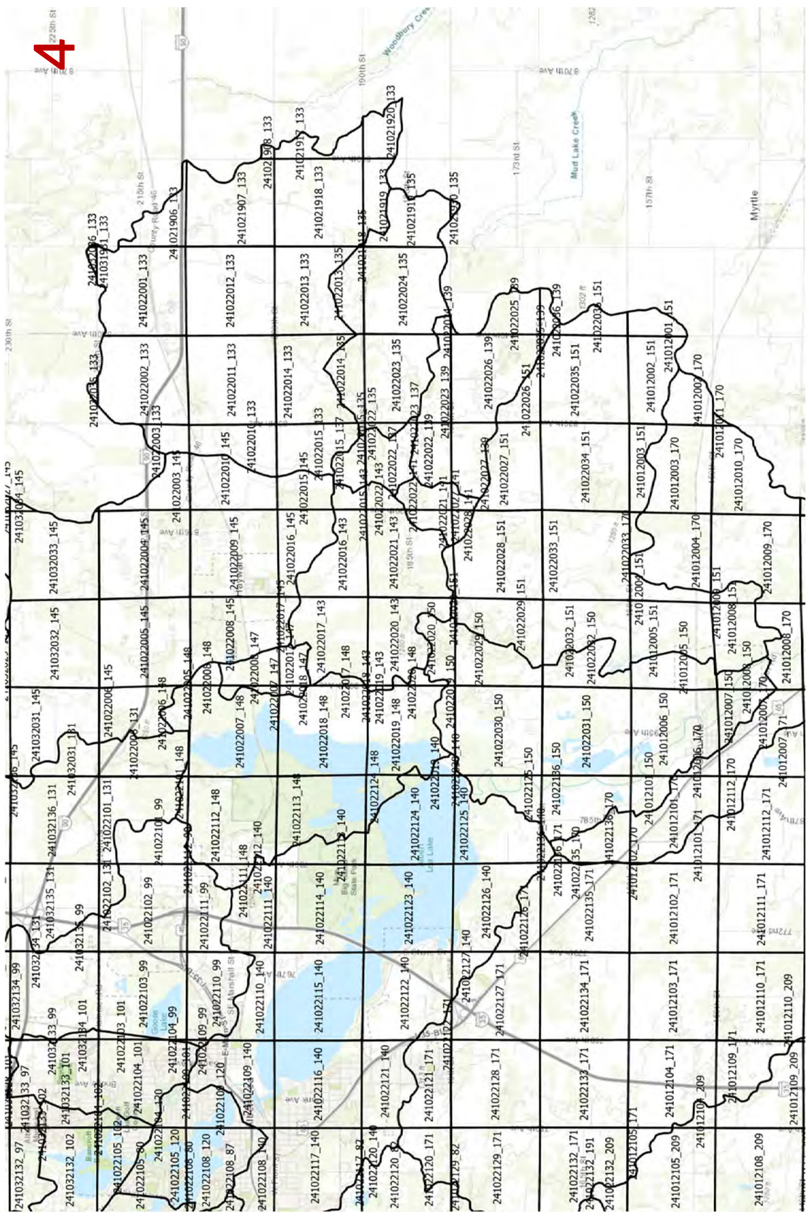

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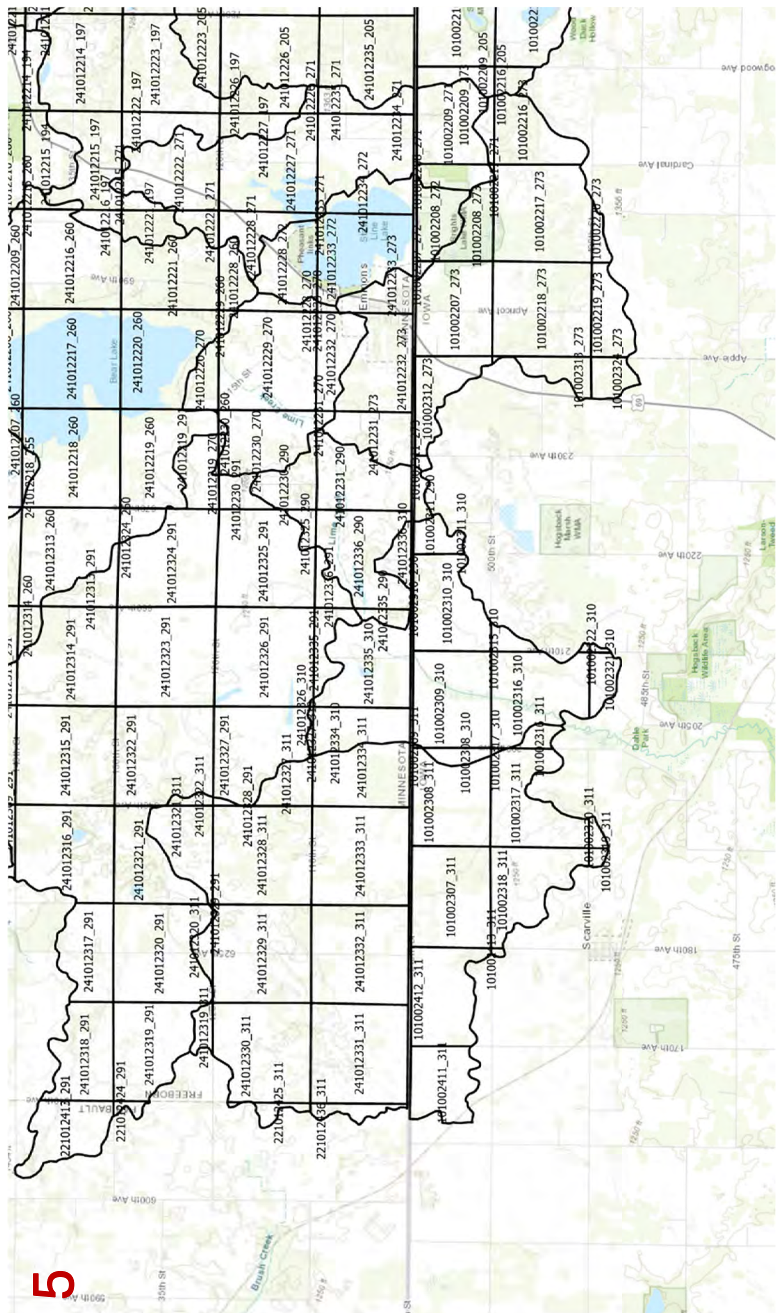

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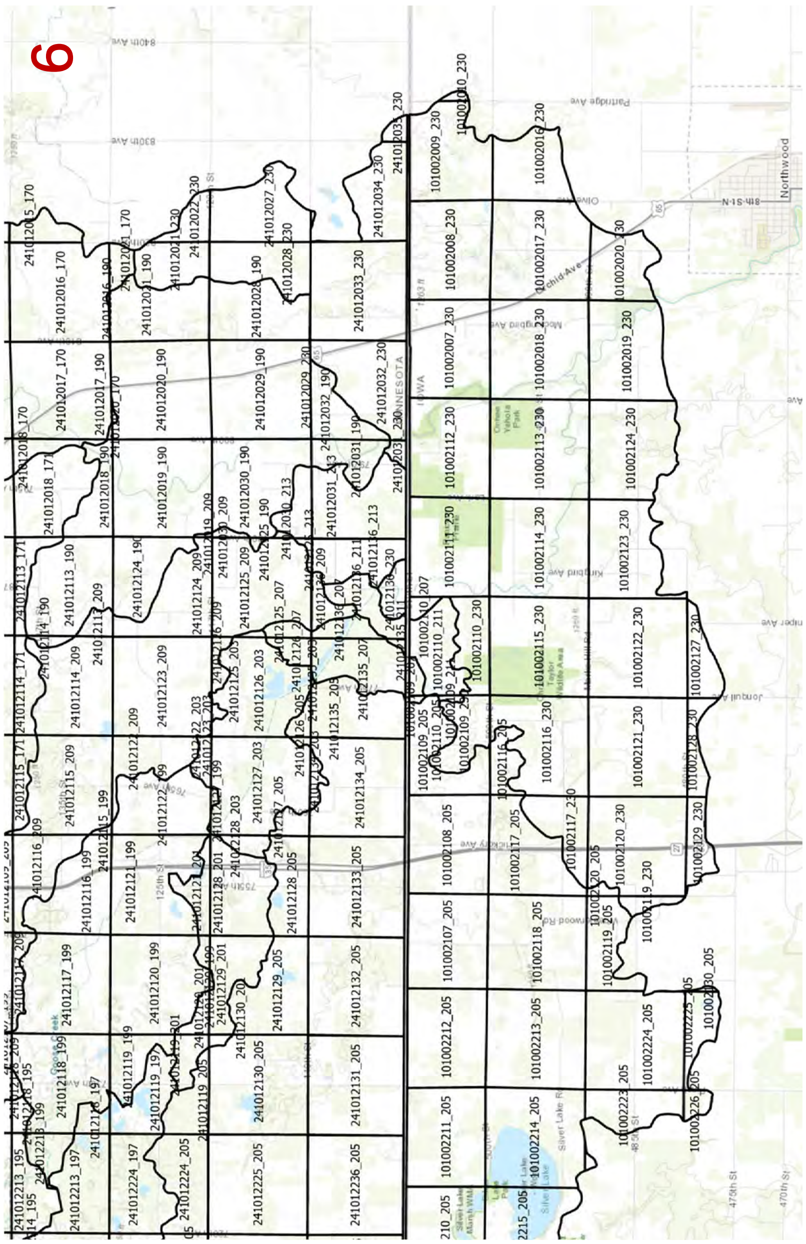

ATTACHMENT B

SAM TARGETED SCENARIO INPUTS

ATTACHMENT B: SAM TARGETED SCENARIO INPUTS

CONSERVATION TILLAGE ON 30 PERCENT OF CROPLAND

Table B-1. Conservation Tillage on 30 Percent of Cropland Targeting Tool Summary

Progress Summary	Reach 80	Reach 120	Reach 140	Reach 148	Reach 190	Reach 213	Reach 260	Reach 310
Total Cost ($/year)	$556,280							
Treated Area (acres)	50433							
Percent of Local Cropland	30.1%							
Percent of Shell Rock	31.7%							
Percent of Winnebago	25.7%							
Treated Area above Location (acres)	7032	14361	15605	6094	28388	8327	6445	11365
Percent of Cropland above Location	38.9%	32.0%	33.8%	31.7%	32.4%	32.2%	32.2%	30.3%
TSS Local Load Reduction (t/yr)	2817	2817	2817	2817	2817	2817	2817	2817
TN Local Load Reduction (lb/yr)	809745	809745	809745	809745	809745	809745	809745	809745
TP Local Load Reduction (lb/yr)	27505	27505	27505	27505	27505	27505	27505	27505
TSS Local % Reduction Achieved	29%	29%	29%	29%	29%	29%	29%	29%
TN Local % Reduction Achieved	10%	10%	10%	10%	10%	10%	10%	10%
TP Local % Reduction Achieved	20%	20%	20%	20%	20%	20%	20%	20%
Effectiveness (%Red/%Area)	0.658	0.658	0.658	0.658	0.658	0.658	0.658	0.658
Cost Effectiveness* (/k$/yr)	1.205	1.205	1.205	1.205	1.205	1.205	1.205	1.205
TSS Reach Load Reduction (t/yr)	406	811	680	234	1178	468	250	445
TN Reach Load Reduction (lb/yr)	87955	168026	82781	49212	237109	138712	36130	120154
TP Reach Load Reduction (lb/yr)	3126.8	6193.2	4273.7	2456.6	17876.3	4659.3	1213.5	4018.2

TSS Reach % Reduction Achieved	26%	23%	21%	24%	21%	27%	30%	28%
TN Reach % Reduction Achieved	12%	10%	10%	9%	9%	11%	10%	11%
TP Reach % Reduction Achieved	24%	20%	22%	24%	17%	23%	22%	22%
Effectiveness (%Red/%Area)	0.531	0.553	0.528	0.600	0.487	0.630	0.640	0.671
Cost Effectiveness (lb/k$/yr)	1.139	0.999	0.940	1.047	0.897	1.143	1.263	1.173

Table B-2. Conservation Tillage on 30 Percent of Cropland SAM Scenario Input by Subwatershed from Targeting Tool

Reach	SAM Reach	SAM Area (Cropland)		SAM Cost	SAM Efficiencies		
		(acres)	%	($/acre/year)	TSS	TN	TP
10	10	2315	69%	11.03	0.83	0.31	0.63
12							
13	13	193	50%	11.03	0.86	0.31	0.62
14							
15	15	1857	50%	11.03	0.92	0.30	0.63
17	17	571	55%	11.03	0.98	0.30	0.64
19	19	1397	30%	11.03	0.93	0.31	0.64
21	21	487	46%	11.03	0.92	0.31	0.64
30	30	59	25%	11.03	1.36	0.27	0.72
32							
50	50	84	94%	11.03	0.80	0.32	0.64
70	70	31	96%	11.03	0.79	0.32	0.63
72							
73	73	16	97%	11.03	0.80	0.32	0.65
80	80	21	97%	11.03	0.80	0.32	0.65
81	81	2096	55%	11.03	0.94	0.31	0.65
191							
82							
84	84	186	78%	11.03	0.88	0.36	0.70
85	85	152	97%	11.03	0.80	0.32	0.64
87	87	50	70%	11.03	1.01	0.38	0.74
89	89	382	19%	11.03	1.21	0.29	0.68
91							
93	93	1154	39%	11.03	1.02	0.32	0.68
95	95	752	19%	11.03	0.95	0.34	0.68
97	97	1796	36%	11.03	0.92	0.32	0.67
99	99	518	31%	11.03	0.93	0.31	0.65
101	101	32	59%	11.03	0.88	0.32	0.65
102	102	211	57%	11.03	0.82	0.34	0.66
120							
140	140	1244	95%	11.03	0.77	0.30	0.60
131	131	591	30%	11.03	1.01	0.31	0.66
133	133	1530	29%	11.03	1.12	0.29	0.63
135	135	250	16%	11.03	1.38	0.29	0.62
137	137	143	47%	11.03	1.12	0.28	0.65
139	139	772	61%	11.03	0.79	0.30	0.61
141							
143	143	266	16%	11.03	0.90	0.33	0.66
145	145	1204	22%	11.03	1.11	0.31	0.66
147	147	131	67%	11.03	0.80	0.30	0.61

148	148	1205	97%	11.03	0.77	0.30	0.61
150	150	1917	100%	11.03	0.79	0.31	0.63
151	151	375	8%	11.03	1.08	0.34	0.69
170	170	2460	61%	11.03	0.83	0.35	0.69
171	171	136	2%	11.03	1.27	0.31	0.69
190	190	1800	53%	11.03	0.90	0.36	0.70
192							
194							
195	195	436	87%	11.03	0.79	0.31	0.63
197							
199	199	1234	60%	11.03	0.93	0.32	0.66
201	201	159	31%	11.03	0.82	0.34	0.66
203	203	566	83%	11.03	0.80	0.32	0.64
205	205	3862	35%	11.03	0.92	0.37	0.71
207	207	141	65%	11.03	0.99	0.32	0.66
209	209	1465	30%	11.03	1.03	0.32	0.67
211	211	85	48%	11.03	1.03	0.38	0.75
213	213	379	80%	11.03	0.76	0.32	0.63
230	230	2354	23%	11.03	0.88	0.41	0.76
251	251	451	13%	11.03	1.07	0.30	0.64
253	253	1107	18%	11.03	1.04	0.31	0.65
255	255	549	29%	11.03	1.20	0.32	0.69
257	257	2410	49%	11.03	0.95	0.32	0.66
260	260	1927	53%	11.03	1.07	0.33	0.68
270	270	184	15%	11.03	0.80	0.34	0.66
271							
272							
273	273	2123	68%	11.03	0.86	0.36	0.70
290	290	629	62%	11.03	0.88	0.32	0.65
291	291	1367	17%	11.03	1.31	0.36	0.75
310	310	617	28%	11.03	0.85	0.61	0.93
311							

FALL COVER CROPS ON 15 PERCENT OF CROPLAND

Table B-3. Fall Cover Crops on 15 Percent of Cropland Targeting Tool Summary

Progress Summary	Reach 80	Reach 120	Reach 140	Reach 148	Reach 190	Reach 213	Reach 260	Reach 310
Total Cost ($/year)	$961,506							
Treated Area (acres)	25318.33							
Percent of Local Cropland	15.1%							
Percent of Shell Rock	15.6%							
Percent of Winnebago	13.7%							
Treated Area above Location (acres)	2782	7096	8002	2979	13858	4241	3213	6056
Percent of Cropland above Location	15.4%	15.8%	17.3%	15.5%	15.8%	16.4%	16.0%	16.1%
TSS Local Load Reduction (t/yr)	1408	1408	1408	1408	1408	1408	1408	1408
TN Local Load Reduction (lb/yr)	619719	619719	619719	619719	619719	619719	619719	619719
TP Local Load Reduction (lb/yr)	8767	8767	8767	8767	8767	8767	8767	8767
TSS Local % Reduction Achieved	15%	15%	15%	15%	15%	15%	15%	15%
TN Local % Reduction Achieved	8%	8%	8%	8%	8%	8%	8%	8%
TP Local % Reduction Achieved	6%	6%	6%	6%	6%	6%	6%	6%
Effectiveness (%Red/%Area)	0.633	0.633	0.633	0.633	0.633	0.633	0.633	0.633
Cost Effectiveness* (/k$/yr)	0.332	0.332	0.332	0.332	0.332	0.332	0.332	0.332
TSS Reach Load Reduction (t/yr)	167	402	351	128	585	231	134	242
TN Reach Load Reduction (lb/yr)	51573	124696	64606	35534	163529	110763	27480	105205
TP Reach Load Reduction (lb/yr)	794.9	2000.7	1635.8	1007.2	7906.3	1534.5	417.7	1459.8
TSS Reach % Reduction Achieved	11%	12%	11%	13%	10%	13%	16%	15%
TN Reach % Reduction Achieved	7%	7%	8%	7%	6%	9%	7%	10%
TP Reach % Reduction Achieved	6.1%	6.4%	8.5%	9.9%	7.7%	7.5%	7.4%	8.1%
Effectiveness (%Red/%Area)	0.515	0.534	0.527	0.633	0.511	0.603	0.649	0.677
Cost Effectiveness (lb/k$/yr)	0.255	0.271	0.268	0.316	0.254	0.309	0.374	0.351

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Table B-4. Fall Cover Crops on 15 Percent of Cropland Sam Scenario Input by Subwatershed From Targeting Tool

Reach	SAM Reach	SAM Area (Cropland) (acres)	%	SAM Cost ($/acre/year)	SAM Efficiencies TSS	TN	TP
10	10	721	21%	37.98	0.80	0.47	0.39
12							
13	13	179	46%	37.98	0.79	0.45	0.38
14							
15	15	920	25%	37.98	0.94	0.44	0.39
17	17	135	13%	37.98	1.40	0.43	0.43
19	19	666	15%	37.98	0.92	0.46	0.40
21	21	12	1%	37.98	7.71	0.44	1.13
30	30	54	23%	37.98	1.26	0.40	0.44
32							
50	50	32	36%	37.98	0.87	0.49	0.42
70	70	29	88%	37.98	0.73	0.45	0.38
72							
73	73	14	89%	37.98	0.74	0.48	0.40
80	80	19	89%	37.98	0.74	0.38	0.34
81	81	1282	33%	37.98	0.91	0.45	0.41
191							
82							
84	84	172	72%	37.98	0.81	0.50	0.41
85	85	18	12%	37.98	0.55	0.91	0.55
87	87	46	65%	37.98	0.93	0.59	0.47
89	89	44	2%	37.98	2.24	0.38	0.51
91							
93	93	927	32%	37.98	1.12	0.44	0.41
95	95	367	9%	37.98	0.97	0.51	0.43
97	97	866	17%	37.98	0.85	0.52	0.43
99	99	299	18%	37.98	0.89	0.52	0.44
101	101	10	18%	37.98	1.14	0.57	0.49
102	102	283	77%	37.98	0.76	0.48	0.40
120							
140	140	906	69%	37.98	0.79	0.50	0.41
131	131	126	6%	37.98	1.42	0.41	0.45
133	133	275	5%	37.98	1.87	0.42	0.42
135	135	150	9%	37.98	1.56	0.44	0.39
137	137	184	61%	37.98	1.03	0.41	0.40
139	139	22	2%	37.98	1.59	0.50	0.45
141							
143	143	3	0%	37.98	1.19	0.47	0.42
145	145	1087	20%	37.98	1.08	0.46	0.41
147	147	18	9%	37.98	1.02	0.42	0.38

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148	148	1114	89%	37.98	0.72	0.47	0.39
150	150	1830	95%	37.98	0.73	0.44	0.37
151							
170							
171							
190	190	1048	31%	37.98	0.88	0.57	0.46
192							
194							
195	195	464	92%	37.98	0.73	0.48	0.40
197							
199	199	46	2%	37.98	1.08	0.55	0.47
201							
203	203	1	0%	37.98	0.96	0.43	0.40
205	205	2792	26%	37.98	0.87	0.57	0.45
207							
209	209	842	17%	37.98	1.06	0.46	0.42
211	211	83	46%	37.98	1.01	0.54	0.45
213	213	12	3%	37.98	2.58	0.37	0.46
230	230	1164	12%	37.98	0.67	0.62	0.47
251	251	11	0%	37.98	1.80	0.35	0.41
253	253	559	9%	37.98	1.06	0.46	0.42
255	255	510	27%	37.98	1.14	0.49	0.44
257	257	582	12%	37.98	1.01	0.45	0.41
260	260	1552	43%	37.98	1.08	0.51	0.43
270	270	13	1%	37.98	1.08	0.49	0.43
271							
272							
273	273	1363	44%	37.98	0.82	0.53	0.42
290							
291	291	748	9%	37.98	1.33	0.54	0.47
310	310	720	32%	37.98	0.78	0.87	0.56
311							

FALL COVER CROPS ON 30 PERCENT OF CROPLAND

Table B-5. Fall Cover Crops on 30 Percent of Cropland Targeting Tool Summary

Progress Summary	Reach 80	Reach 120	Reach 140	Reach 148	Reach 190	Reach 213	Reach 260	Reach 310
Total Cost ($/year)	$1,893,872							
Treated Area (acres)	49869.37							
Percent of Local Cropland	29.8%							
Percent of Shell Rock	30.4%							
Percent of Winnebago	28.0%							
Treated Area above Location (acres)	5580	13891	15041	5864	27586	7869	6391	12355
Percent of Cropland above Location	30.9%	31.0%	32.6%	30.5%	31.5%	30.5%	31.9%	32.9%
TSS Local Load Reduction (t/yr)	2585	2585	2585	2585	2585	2585	2585	2585
TN Local Load Reduction (lb/yr)	1177931	1177931	1177931	1177931	1177931	1177931	1177931	1177931
TP Local Load Reduction (lb/yr)	16681	16681	16681	16681	16681	16681	16681	16681
TSS Local % Reduction Achieved	27%	27%	27%	27%	27%	27%	27%	27%
TN Local % Reduction Achieved	15%	15%	15%	15%	15%	15%	15%	15%
TP Local % Reduction Achieved	12%	12%	12%	12%	12%	12%	12%	12%
Effectiveness (%Red/%Area)	0.600	0.600	0.600	0.600	0.600	0.600	0.600	0.600
Cost Effectiveness* (/k$/yr)	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
TSS Reach Load Reduction (t/yr)	302	723	604	217	1060	416	230	450
TN Reach Load Reduction (lb/yr)	103178	241680	119231	71159	342506	196464	52914	196635
TP Reach Load Reduction (lb/yr)	1530.8	3722.6	2564.3	1469.5	10493.8	2750.5	726.7	2742.3

TSS Reach % Reduction Achieved	20%	21%	19%	22%	19%	24%	28%	28%
TN Reach % Reduction Achieved	14%	14%	15%	13%	13%	16%	14%	18%
TP Reach % Reduction Achieved	11.7%	11.9%	13.3%	14.4%	10.2%	13.5%	12.9%	15.2%
Effectiveness (%Red/%Area)	0.486	0.506	0.479	0.542	0.444	0.581	0.577	0.619
Cost Effectiveness (lb/k$/yr)	0.235	0.249	0.231	0.267	0.225	0.283	0.326	0.332

Table B-6. Fall Cover Crops on 30 Percent of Cropland SAM Scenario Input by Subwatershed from Targeting Tool

Reach	SAM Reach	SAM Area (Cropland) (acres)	%	SAM Cost ($/acre/year)	SAM Efficiencies TSS	TN	TP
10	10	1514	45%	37.98	0.76	0.46	0.39
12							
13	13	179	46%	37.98	0.79	0.45	0.38
14							
15	15	1715	46%	37.98	0.86	0.44	0.38
17	17	528	50%	37.98	0.91	0.43	0.39
19	19	1190	26%	37.98	0.87	0.46	0.39
21	21	160	15%	37.98	1.30	0.43	0.43
30	30	200	84%	37.98	0.76	0.46	0.39
32							
50	50	32	36%	37.98	0.87	0.49	0.42
70	70	29	88%	37.98	0.73	0.45	0.38
72							
73	73	14	89%	37.98	0.74	0.48	0.40
80	80	19	89%	37.98	0.74	0.38	0.34
81	81	1936	51%	37.98	0.87	0.46	0.41
191							
82							
84	84	172	72%	37.98	0.81	0.50	0.41
85	85	141	89%	37.98	0.74	0.45	0.38
87	87	46	65%	37.98	0.93	0.59	0.47
89	89	513	25%	37.98	1.12	0.42	0.41
91							
93	93	1550	53%	37.98	0.95	0.47	0.41
95	95	1010	26%	37.98	0.88	0.50	0.42
97	97	1955	39%	37.98	0.85	0.49	0.41
99	99	695	42%	37.98	0.86	0.49	0.42
101	101	10	18%	37.98	1.14	0.57	0.49
102	102	283	77%	37.98	0.76	0.48	0.40
120							
140	140	1149	88%	37.98	0.71	0.47	0.39
131	131	546	28%	37.98	0.94	0.47	0.42
133	133	836	16%	37.98	1.34	0.42	0.39
135	135	313	20%	37.98	1.28	0.43	0.38
137	137	184	61%	37.98	1.03	0.41	0.40
139	139	821	65%	37.98	0.73	0.44	0.37
141							
143	143	341	21%	37.98	0.83	0.48	0.40
145	145	1542	28%	37.98	1.02	0.47	0.41
147	147	168	85%	37.98	0.74	0.46	0.38

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148	148	1114	89%	37.98	0.72	0.47	0.39
150	150	1830	95%	37.98	0.73	0.44	0.37
151	151	358	7%	37.98	1.00	0.46	0.40
170	170	2562	64%	37.98	0.74	0.51	0.42
171	171	680	9%	37.98	0.85	0.49	0.41
190	190	1252	37%	37.98	0.85	0.56	0.45
192							
194							
195	195	464	92%	37.98	0.73	0.48	0.40
197							
199	199	1124	55%	37.98	0.92	0.47	0.42
201	201	170	33%	37.98	0.76	0.50	0.41
203	203	444	65%	37.98	0.77	0.46	0.39
205	205	4118	38%	37.98	0.85	0.55	0.44
207	207	150	69%	37.98	0.91	0.42	0.37
209	209	1108	23%	37.98	0.98	0.48	0.42
211	211	83	46%	37.98	1.01	0.54	0.45
213	213	208	44%	37.98	0.80	0.46	0.39
230	230	2060	21%	37.98	0.81	0.57	0.45
251	251	447	13%	37.98	0.99	0.43	0.39
253	253	1171	19%	37.98	0.95	0.46	0.40
255	255	832	44%	37.98	0.92	0.48	0.41
257	257	2390	48%	37.98	0.88	0.46	0.40
260	260	1552	43%	37.98	1.08	0.51	0.43
270	270	768	62%	37.98	0.71	0.47	0.39
271							
272							
273	273	2476	79%	37.98	0.80	0.50	0.41
290	290	404	40%	37.98	0.89	0.45	0.40
291	291	1595	20%	37.98	1.21	0.53	0.46
310	310	720	32%	37.98	0.78	0.87	0.56
311							

FALL COVER CROPS ON 50 PERCENT OF CROPLAND AND CONSERVATION TILLAGE ON 30 PERCENT OF CROPLAND

Table B-7. Fall Cover Crops on 50 Percent of Cropland and Conservation Tillage on 30 Percent of Cropland Targeting Tool Summary

Progress Summary	Cover Crop								Tillage							
Reach Number	80	120	140	148	190	213	260	310	80	120	140	148	190	213	260	310
Total Cost ($/year)	$3,177,343								$556,280							
Treated Area (acres)	83665.67								50433.35							
Percent of Local Cropland	49.9%								30.1%							
Percent of Shell Rock	51.7%								31.7%							
Percent of Winnebago	45.1%								25.7%							
Treated Area above Location (acres)	11510	23695	24844	9979	46065	13175	10672	19935	7032	14361	15605	6094	28388	8327	6445	11365
Percent of Cropland above Location	63.7%	52.8%	53.8%	51.9%	52.6%	51.0%	53.3%	53.1%	38.9%	32.0%	33.8%	31.7%	32.4%	32.2%	32.2%	30.3%
TSS Local Load Reduction (t/yr)	4037	4037	4037	4037	4037	4037	4037	4037	928	928	928	928	928	928	928	928
TN Local Load Reduction (lb/yr)	1915087	1915087	1915087	1915087	1915087	1915087	1915087	1915087	470448	470448	470448	470448	470448	470448	470448	470448
TP Local Load Reduction (lb/yr)	27090	27090	27090	27090	27090	27090	27090	27090	17817	17817	17817	17817	17817	17817	17817	17817
TSS Local % Reduction Achieved	42%	42%	42%	42%	42%	42%	42%	42%	16%	16%	16%	16%	16%	16%	16%	16%

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TN Local % Reduction Achieved	24%	24%	24%	24%	24%	24%	24%	24%	8%	8%	8%	8%	8%	8%	8%	8%
TP Local % Reduction Achieved	20%	20%	20%	20%	20%	20%	20%	20%	16%	16%	16%	16%	16%	16%	16%	16%
Effectiveness (%Red/%Area)	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.449	0.449	0.449	0.449	0.449	0.449	0.449	0.449
Cost Effectiveness* (/k$/yr)	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720
TSS Reach Load Reduction (t/yr)	556	1132	919	324	1650	645	345	650	150	289	243	78	403	155	75	133
TN Reach Load Reduction (lb/yr)	211312	407314	194283	119668	558018	313920	85096	290754	53306	100331	49322	28468	138255	79977	20371	68703
TP Reach Load Reduction (lb/yr)	3008.4	6029.0	3617.0	2096.8	13442.2	4373.8	1121.0	3984.0	2093.7	4098.8	2816.6	1594.5	11572.0	3005.3	769.0	2563.7
TSS Reach % Reduction Achieved	36%	33%	29%	33%	30%	37%	42%	40%	15%	12%	11%	12%	10%	14%	16%	14%
TN Reach % Reduction Achieved	28%	24%	24%	22%	21%	25%	23%	26%	10%	8%	8%	7%	6%	9%	7%	8%
TP Reach % Reduction Achieved	23.0%	19.3%	18.8%	20.6%	13.1%	21.5%	19.9%	22.1%	21%	16%	18%	20%	13%	19%	17%	18%
Effectiveness (%Red/%Area)	0.456	0.479	0.442	0.486	0.402	0.547	0.532	0.558	0.393	0.379	0.361	0.403	0.306	0.429	0.415	0.448
Cost Effectiveness (lb/k$/yr)	0.260	0.233	0.207	0.237	0.205	0.262	0.292	0.286	0.714	0.575	0.526	0.583	0.471	0.652	0.702	0.646

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RESPEC

Table B-8. Fall Cover Crops on 50 Percent of Cropland and Conservation Tillage on 30 Percent of Cropland SAM Scenario Input by Subwatershed From Targeting Tool

Reach	SAM Reach	SAM Area (Cropland)		SAM Cost	SAM Efficiencies		
		(acres)	%	($/acre/year)	TSS	TN	TP
10	10	2544	75%	48.01	1.03	0.62	0.76
12	12	1179	45%	37.98	0.81	0.45	0.39
13	13	243	63%	46.77	1.03	0.59	0.71
14							
15	15	3235	87%	44.31	0.91	0.55	0.62
17	17	719	69%	46.75	1.10	0.59	0.72
19	19	2317	51%	44.63	0.99	0.57	0.64
21	21	934	88%	43.73	0.89	0.55	0.60
30	30	200	84%	41.23	0.90	0.51	0.53
32							
50	50	84	94%	46.10	0.96	0.61	0.78
70	70	31	96%	46.10	0.95	0.61	0.77
72							
73	73	16	97%	46.11	0.96	0.63	0.79
80	80	21	97%	46.11	0.96	0.57	0.76
81	81	2370	62%	47.73	1.11	0.63	0.78
191							
82							
84	84	186	78%	46.11	1.05	0.68	0.84
85	85	152	97%	46.11	0.95	0.61	0.77
87	87	50	70%	46.11	1.21	0.76	0.91
89	89	513	25%	46.19	1.42	0.55	0.74
91	91	353	10%	37.98	0.88	0.47	0.41
93	93	1688	58%	45.52	1.16	0.60	0.71
95	95	2382	61%	41.46	0.88	0.54	0.54
97	97	3168	63%	44.23	0.97	0.58	0.65
99	99	1020	62%	43.57	0.95	0.58	0.62
101	101	49	92%	45.07	0.92	0.59	0.66
102	102	283	77%	46.19	0.97	0.63	0.72
120							
140	140	1244	95%	46.11	0.95	0.61	0.76
131	131	1253	63%	43.18	0.98	0.55	0.60
133	133	1959	37%	46.59	1.31	0.55	0.69
135	135	576	36%	42.77	1.27	0.50	0.55
137	137	184	61%	46.59	1.32	0.53	0.73
139	139	1176	93%	45.22	0.87	0.55	0.62
141	141	122	54%	37.98	0.96	0.41	0.37
143	143	1451	90%	40.00	0.78	0.49	0.46

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145	145	1956	35%	44.77	1.19	0.57	0.66
147	147	188	96%	45.64	0.89	0.58	0.65
148	148	1205	97%	46.11	0.94	0.61	0.76
150	150	1917	100%	47.28	0.94	0.60	0.76
151	151	987	20%	42.17	1.12	0.53	0.56
170	170	2569	64%	48.54	0.98	0.71	0.84
171	171	4119	52%	38.34	0.84	0.46	0.41
190	190	1800	53%	47.67	1.08	0.71	0.86
192							
194							
195	195	470	93%	48.21	0.96	0.64	0.76
197	197	780	41%	37.98	0.90	0.46	0.41
199	199	1387	67%	47.79	1.13	0.64	0.79
201	201	473	93%	41.69	0.81	0.53	0.53
203	203	636	93%	47.80	0.96	0.62	0.75
205	205	5099	47%	46.33	1.06	0.69	0.78
207	207	150	69%	48.32	1.20	0.61	0.78
209	209	3686	76%	42.36	0.92	0.54	0.57
211	211	91	51%	48.32	1.27	0.75	0.90
213	213	404	85%	48.32	0.94	0.63	0.76
230	230	4491	45%	43.76	0.94	0.65	0.68
251	251	956	27%	43.18	1.04	0.51	0.57
253	253	3076	51%	41.95	0.93	0.52	0.54
255	255	1376	72%	42.38	0.95	0.54	0.57
257	257	3354	68%	45.90	1.05	0.58	0.69
260	260	1927	53%	48.69	1.31	0.67	0.84
270	270	1194	96%	39.68	0.75	0.48	0.44
271							
272							
273	273	2509	80%	47.31	1.01	0.67	0.78
290	290	877	86%	45.90	0.94	0.59	0.68
291	291	3963	50%	41.78	1.08	0.54	0.57
310	310	720	32%	47.43	1.02	1.18	1.08
311							

RESPEC

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INCREASE WATER STORAGE BY 10 PERCENT

Table B-9. Increase Water Storage by 10 Percent Targeting Tool Summary

Progress Summary	Reach 80	Reach 120	Reach 140	Reach 148	Reach 190	Reach 213	Reach 260	Reach 310
Total Cost ($/year)	$530,561							
Treated Area (acres)	16768.68							
Percent of Local Cropland	10.0%							
Percent of Shell Rock	10.5%							
Percent of Winnebago	8.7%							
Treated Area above Location (acres)	2825	4723	5102	2049	9183	2713	2103	3860
Percent of Cropland above Location	15.6%	10.5%	11.0%	10.7%	10.5%	10.5%	10.5%	10.3%
TSS Local Load Reduction (t/yr)	771	771	771	771	771	771	771	771
TN Local Load Reduction (lb/yr)	404129	404129	404129	404129	404129	404129	404129	404129
TP Local Load Reduction (lb/yr)	5982	5982	5982	5982	5982	5982	5982	5982
TSS Local % Reduction Achieved	8%	8%	8%	8%	8%	8%	8%	8%
TN Local % Reduction Achieved	5%	5%	5%	5%	5%	5%	5%	5%
TP Local % Reduction Achieved	4%	4%	4%	4%	4%	4%	4%	4%
Effectiveness (%Red/%Area)	0.579	0.579	0.579	0.579	0.579	0.579	0.579	0.579
Cost Effectiveness* (/k$/yr)	0.337	0.337	0.337	0.337	0.337	0.337	0.337	0.337
TSS Reach Load Reduction (t/yr)	131	217	182	68	318	124	63	120
TN Reach Load Reduction (lb/yr)	54641	85446	41941	26303	114540	66864	17856	60292
TP Reach Load Reduction (lb/yr)	810.1	1303.5	901.1	548.0	2707.5	973.0	245.1	862.0
TSS Reach % Reduction Achieved	9%	6%	6%	7%	6%	7%	8%	7%
TN Reach % Reduction Achieved	7%	5%	5%	5%	4%	5%	5%	5%
TP Reach % Reduction Achieved	6%	4%	5%	5%	3%	5%	4%	5%
Effectiveness (%Red/%Area)	0.467	0.489	0.468	0.535	0.400	0.549	0.537	0.575
Cost Effectiveness (lb/k$/yr)	0.373	0.271	0.254	0.304	0.237	0.308	0.327	0.322

Table B-10. Increase Water Storage by 10 Percent SAM Scenario Input by Subwatershed From Targeting Tool

Reach	SAM Reach	SAM Area (Cropland) (acres)	%	SAM Cost ($/acre/year)	SAM Efficiencies TSS	TN	TP
10	10	551	16%	31.64	0.73	0.47	0.42
12	12	327	12%	31.64	0.77	0.47	0.42
13	13	74	19%	31.64	0.70	0.47	0.42
14							
15	15	699	19%	31.64	0.70	0.47	0.42
17	17	155	15%	31.64	0.79	0.47	0.43
19	19	745	16%	31.64	0.72	0.48	0.42
21	21	202	19%	31.64	0.70	0.47	0.42
30	30	43	18%	31.64	0.73	0.48	0.43
32							
50	50	17	19%	31.64	0.70	0.47	0.42
70	70	6	19%	31.64	0.70	0.47	0.42
72							
73	73	2	12%	31.64	0.70	0.47	0.42
80	80	3	12%	31.64	0.70	0.47	0.42
81	81	295	8%	31.64	0.79	0.49	0.44
191							
82							
84	84	23	10%	31.64	0.77	0.53	0.46
85	85	19	12%	31.64	0.70	0.47	0.42
87	87	6	9%	31.64	0.88	0.57	0.48
89	89	128	6%	31.64	0.80	0.49	0.44
91	91	57	2%	31.64	0.85	0.50	0.45
93	93	313	11%	31.64	0.83	0.51	0.45
95	95	286	7%	31.64	0.77	0.52	0.45
97	97	579	12%	31.64	0.73	0.50	0.44
99	99	138	8%	31.64	0.78	0.50	0.44
101	101	7	13%	31.64	0.77	0.46	0.42
102	102	46	13%	31.64	0.74	0.51	0.44
120							
140	140	379	29%	31.64	0.71	0.48	0.42
131	131	106	5%	31.64	0.85	0.50	0.45
133	133	248	5%	31.64	0.96	0.46	0.43
135	135	39	2%	31.64	1.29	0.49	0.45
137	137	56	19%	31.64	1.04	0.45	0.46
139	139	361	28%	31.64	0.70	0.48	0.42
141	141	38	17%	31.64	0.95	0.45	0.42
143	143	311	19%	31.64	0.74	0.47	0.42
145	145	473	8%	31.64	1.01	0.50	0.46
147	147	51	26%	31.64	0.72	0.47	0.42

148	148	367	29%	31.64	0.70	0.47	0.42
150	150	230	12%	31.64	0.70	0.47	0.42
151	151	408	8%	31.64	0.76	0.50	0.44
170	170	431	11%	31.64	0.71	0.53	0.45
171	171	707	9%	31.64	0.78	0.48	0.43
190	190	256	8%	31.64	0.80	0.55	0.47
192							
194							
195	195	87	17%	31.64	0.70	0.47	0.42
197	197	182	10%	31.64	0.81	0.48	0.44
199	199	258	13%	31.64	0.84	0.49	0.45
201	201	88	17%	31.64	0.70	0.47	0.42
203	203	112	17%	31.64	0.71	0.48	0.42
205	205	1114	10%	31.64	0.78	0.54	0.46
207	207	32	15%	31.64	0.77	0.49	0.43
209	209	747	15%	31.64	0.73	0.49	0.43
211	211	17	9%	31.64	0.93	0.59	0.50
213	213	75	16%	31.64	0.69	0.50	0.44
230	230	1013	10%	31.64	0.74	0.51	0.44
251	251	210	6%	31.64	0.82	0.48	0.43
253	253	552	9%	31.64	0.79	0.48	0.43
255	255	283	15%	31.64	0.74	0.49	0.43
257	257	668	14%	31.64	0.78	0.48	0.43
260	260	389	11%	31.64	0.89	0.51	0.45
270	270	229	19%	31.64	0.70	0.47	0.42
271							
272							
273	273	475	15%	31.64	0.76	0.53	0.46
290	290	141	14%	31.64	0.80	0.50	0.45
291	291	756	10%	31.64	0.92	0.52	0.46
310	310	155	7%	31.64	0.90	0.90	0.63
311							