

POMME DE TERRE RIVER

Comprehensive Watershed Management Plan



December 2019

Big Stone, Douglas, Grant, Stevens, Swift, and West Otter Tail Counties and Soil and Water Conservation Districts and the Pomme de Terre River Association

TABLE OF CONTENTS

LIST OF FIGURES	III
LIST OF TABLES	III
LIST OF APPENDICES	IV
ACKNOWLEDGEMENTS	V
ACRONYMS	VI
GLOSSARY	VII
1 EXECUTIVE SUMMARY	1
2 PRIORITIZATION OF ISSUES AND RESOURCES	11
2.1 PRIORITIZING ISSUES	13
2.2 PRIORITIZING AREAS FOR IMPLEMENTATION	13
2.3 IDENTIFYING MEASURABLE GOALS	15
2.4 SUMMARY	15
3 ISSUES, GOALS AND IMPLEMENTATION ACTIVITIES	18
3.1 GROUNDWATER	19
3.1.1 Drinking Water Protection	19
3.1.2 Groundwater Conservation	20
3.2 HYDROLOGY	22
3.2.1 Altered Hydrology	22
3.3 LAKES, WETLANDS, AND SHALLOW BASINS	24
3.3.1 Poor Quality Lakes	24
3.3.2 High Quality Lakes	27
3.3.3 Protect and Restore Perennial Cover and Shallow Basins	30
3.4 RIVER & STREAMS	31
3.4.1 Excess pollutants	31
3.4.2 Loss of In-Stream Habitat	33
3.5 ECOSYSTEM HEALTH	35
3.5.1 Aquatic Invasive Species Management	35
3.6 SOCIOECONOMIC FACTORS	36
3.6.1 Watershed Outreach	36
3.6.2 Lakeshore Owner Education	38
4 TARGETED IMPLEMENTATION SCHEDULE	40
4.1 TARGETED IMPLEMENTATION PLAN STRUCTURE	40
4.2 PRIORITIZATION OF PROGRAMS AND PROJECTS	49
4.2.1 Identification of Roles and Responsibilities towards Implementation	50
4.3 ACCOUNTING FOR LOCAL FUNDS	51
5 EXISTING IMPLEMENTATION PROGRAMS	53
5.1 INCENTIVE PROGRAMS	53
5.1.1 Cost-Share Programs	53
5.1.2 Low-Interest Loans	53
5.1.3 Regulatory Assistance Programs	54

5.1.4	Conservation Easements	54
5.1.5	Land Acquisition	54
5.2	CAPITAL IMPROVEMENTS	57
5.2.1	Drainage	57
5.2.2	Permanent Protection	59
5.3	OPERATION AND MAINTENANCE	61
5.4	REGULATION AND ENFORCEMENT	61
5.4.1	County Regulation	62
5.4.2	Regulatory & Enforcement Programs	64
5.4.3	Comprehensive Land Use Plans	65
5.5	INFORMATION, OUTREACH, AND EDUCATION PROGRAMS	65
5.6	DATA COLLECTION AND MONITORING	66
5.6.1	County and Soil and Water Conservation District (SWCD) Monitoring Data	67
5.6.2	Federal, State, and Private Organizations	69
5.6.3	Monitoring Sites	74
5.6.4	Assessment of Plan Progress	76
5.6.5	Data Collection, Analysis and Sharing Locally Collected Data	77
5.7	PROGRAMMATIC GAPS	78
6	PLAN ADMINISTRATION AND COORDINATION	79
6.1	ORGANIZATION STRUCTURE OR FORMAL AGREEMENTS	79
6.2	DECISION-MAKING AND STAFFING	79
6.2.1	Joint Powers Board	80
6.2.2	Technical Advisory Committee	80
6.2.3	Share Services / Fiscal / Administrative Agent	80
6.3	COLLABORATION WITH OTHER UNITS OF GOVERNMENT	81
6.3.1	Collaboration with Non-Governmental Organizations	81
6.4	FUNDING	82
6.4.1	Local Funding	82
6.4.2	State Funding	82
6.4.3	Federal Funding	82
6.4.4	Collaborative Grants	83
6.4.5	Other Funding Sources	83
6.5	WORK PLANNING	84
6.5.1	Project Selection within Targeted Implementation Areas	84
6.5.2	Funding Request	85
6.6	ASSESSMENT, EVALUATION AND REPORTING	85
6.6.1	Annual Evaluation	86
6.6.2	Partnership Assessment	86
6.6.3	Five Year Evaluation	86
6.6.4	Reporting	87
6.7	PLAN AMENDMENT PROCESS	87
6.7.1	Plan Amendment Process	87

LIST OF FIGURES

Figure 1-1. Pomme de Terre River Planning Area and Priority Areas.....	2
Figure 2-1. Schematic of the Comprehensive Watershed Management Planning Process	11
Figure 2-2. Best management practice targeting illustration to achieve measurable reductions in water quality ...	12
Figure 2-3. Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Northern Region)	16
Figure 2-4. Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Southern Region)	17
Figure 5-1. All streams in the Pomme de Terre Watershed with Monitoring Data.....	74
Figure 5-2. All lakes in the Pomme de Terre Watershed with monitoring data.....	75

LIST OF TABLES

Table 1-1. Anticipated roles for plan implementation to be incorporated into governance structure.....	10
Table 2-1. Comprehensive Watershed Priority Model feature description and resources	14
Table 3-1. Pace-of-Progress Measures for Drinking Water Protection	20
Table 3-2. Pace-of-Progress Measures for Groundwater Conservation.....	21
Table 3-3. Pace-of-Progress Measures for Altered Hydrology.....	23
Table 3-4. Observed Water Quality Conditions for Poor Quality Lakes (2017 MPCA Assessment)	24
Table 3-5. Existing Phosphorus Loads and Load Reduction Goals for Poor Quality Lakes.....	25
Table 3-6. Poor Quality Lake Projected Implementation and Estimated Load Reduction.....	26
Table 3-7. Observed Water Quality Conditions for High Quality Lakes (2017 MPCA Assessment).....	27
Table 3-8. Existing Phosphorus Loads and Load Reduction Goals for High Quality Lakes	28
Table 3-9. High Quality Lake Phosphorus Load Reductions by Activity, lb/yr.....	29
Table 3-10. Existing Sediment Loads and Load Reduction Goals for Drywood Creek and the Pomme de Terre Corridor	32
Table 3-11. Existing Phosphorus Loads and Load Reduction Goals for Drywood Creek and the Pomme de Terre River Corridor.....	32
Table 3-12. Drywood Creek Sediment and Phosphorus Load Reductions by Activity.....	33
Table 4-1. Pomme de Terre River Comprehensive Watershed Management Plan Budget Summary Table (2021-2030)	41
Table 4-2. Groundwater Issues & Goals Targeted Implementation Schedule (2021-2030)	41
Table 4-3. Altered Hydrology Issues & Goals Targeted Implementation Schedule (2021-2030)	42
Table 4-4. Lakes, Wetlands, and Shallow Basins Issues & Goals Targeted Implementation Schedule (2021-2030) ..	44
Table 4-5. Rivers and Streams Issues & Goals Targeted Implementation Schedule (2021-2030).....	45
Table 4-6. Ecosystem Health Issues & Goals Targeted Implementation Schedule (2021-2030).....	47
Table 4-7. Socioeconomic Factors Issues & Goals Targeted Implementation Schedule (2021-2030).....	47
Table 4-8. Estimated Water Management Activity Funds Allocated in the Pomme de Terre watershed in 2017	52
Table 5-1. Existing Incentive Programs.....	55
Table 5-2. Summary of Public Drainage System.....	58
Table 5-3. Summary of Permanent Protections.....	60
Table 5-4. Existing Operations & Maintenance Programs	61
Table 5-5. Existing Regulatory and Enforcement Programs.....	64
Table 5-6. Existing Public Participation and Engagement Programs	65
Table 5-7. Existing Data Collection & Monitoring Programs.....	66
Table 5-8. Lakes historically (prior to 2007) monitored by Stevens County	67
Table 5-9. Stream sites historically monitored by Stevens County	67
Table 5-10. Stream sites historically monitored by Stevens County	67
Table 5-11. Lakes historically monitored by the Grant County SWCD	67
Table 5-12. Stream sites historically monitored by the Grant County SWCD	67

Table 5-13. Stream sites historically monitored by the Grant County SWCD 67
Table 5-14. Stream sites historically monitored by Swift County 68
Table 5-15. Stream sites historically monitored by Swift County 68
Table 5-16. Lakes monitored for Pomme de Terre SWAG 69
Table 5-17. Stream sites monitored for the Pomme de Terre SWAG 69
Table 5-18. Lakes monitored for the Lake Monitoring Program 70
Table 5-19. Lakes monitored for the Lake Monitoring Program 70
Table 5-20. Lakes monitored for the MPCA Citizen Lake Monitoring Program 71
Table 5-21. Stream sites monitored for the MPCA Citizen Stream Monitoring Program 71
Table 5-22. Stream sites monitored for the MPCA Major Watershed Pollutant Load Monitoring Network 71
Table 5-23. Lakes monitored for the MN DNR Shallow Lakes Program 72
Table 5-24. Lakes monitored for the MN DNR Shallow Lakes Program 72
Table 5-25. Stream site monitored for the MDA Surface Water Pesticide Water Quality Monitoring Program 72
Table 5-26. Lakes monitored for the U.S. EPA National Lakes Assessment 73
Table 5-27. Existing monitoring data available to evaluate progress toward the Plan goals 77
Table 6-1. Targeting Tools by Project Type 84
Table 6-2. Measuring Tools by Project Type 85
Table 6-3. MPCA WRAPS Cycle II Schedule for the Pomme de Terre River Watershed 86

LIST OF APPENDICES

- Appendix A** – Land and Water Resource Inventory
- Appendix B** – Documents Reviewed and Public Engagement
- Appendix C** – Zonation Tool Supporting Information
- Appendix D** – Pomme de Terre River Association Joint Powers Agreement

ACKNOWLEDGEMENTS

The Pomme de Terre River Comprehensive Watershed Management Plan was developed with the participation of numerous people. Partnering Counties, Soil and Water Conservation Districts (SWCD), and the Pomme de Terre River Association wish to acknowledge the following groups and individuals for their involvement in the planning process. Without their hard work and dedication, this Plan would not have been possible.

County Board of Commissioners

Big Stone County Board of Commissioners
Grant County Board of Commissioners
Otter Tail County Board of Commissioners
Stevens County Board of Commissioners
Swift County Board of Commissioners
Douglas County Board of Commissioners

Soil and Water Conservation District Board of Supervisors

Big Stone SWCD Board of Supervisors
Grant SWCD Board of Supervisors
West Otter Tail SWCD Board of Supervisors
Stevens SWCD Board of Supervisors
Swift SWCD Board of Supervisors
Douglas SWCD Board of Supervisors

Pomme de Terre River Association / Policy Committee

<i>Paul Barsness</i>	<i>Clint Schuerman</i>
<i>Keith Englund</i>	<i>Keith Swanson</i>
<i>Jeanne Ennen</i>	<i>Rod Wenstrom</i>
<i>Joe Fox</i>	<i>Dale Schlieman</i>
<i>Paul Groneberg</i>	<i>Dan Morrill</i>
<i>John Lindquist</i>	<i>Jay Backer</i>
<i>Dave Lonergan</i>	<i>Tim Kalina</i>
<i>Stephanie Adams</i>	

Citizen Advisory Committee

<i>Dennis Mosher</i>	<i>Dan Gahlon</i>
<i>Tom Amundson</i>	<i>Ed Brands</i>
<i>Rob Westby</i>	<i>Blaine Hill</i>
<i>Loreli Westby</i>	<i>Doug Wulf</i>
<i>Pat Prunty</i>	<i>Jason Kirwin</i>
<i>Mark Starner</i>	<i>Dale Ennen</i>
<i>Ruth Hubbard</i>	<i>Byron Giese</i>
<i>Richard Mickelson</i>	<i>Brian Wojtalewicz</i>
<i>Gary Nelson</i>	<i>Tim Koosman</i>
<i>John Etnier</i>	<i>Randy Hanson</i>
<i>Helen Etnier</i>	

Planning Committee

Adam Maleski, Big Stone SWCD
Beau Peterson, Big Stone SWCD
Darren Wilke, Big Stone County
Environmental Services
Danny Tuckett, Big Stone County
Environmental Services
Danica Mazurek, Douglas SWCD
Danielle Anderson, Douglas SWCD
Andy Rice, Douglas SWCD
Joe Montonye, Grant SWCD
Greg Lillemon, Grant County Land
Management
Brad Mergens, West Otter Tail SWCD
Ben Underhill, West Otter Tail SWCD
Bill Kalar, Otter Tail County Land &
Resource Management
Kyle Westergard, Otter Tail County Land
& Resource Management
Matt Solemsaas, Stevens SWCD
Bill Kleindl, Stevens County
Environmental Services
Andy Albertsen, Swift SWCD
Pete Waller, BWSR
Brad Wozney, BWSR
Emily Siira, MN DNR
Ryan Bjerke, MN DNR
Annette Drewes, MN DNR
Paul Wymar, MPCA
Amanda Strommer, MDH

ACRONYMS

BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
CWMP	Comprehensive Watershed Management Plan
DWSMA	Drinking Water Supply Management Area
<i>E. coli</i>	<i>Escherichia coli</i>
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FY	Fiscal year
GIS	Geographic Information Systems
HSPF	Hydrological Simulation Program - Fortran
HUC	Hydrological Unit Code
IBI	Indices of Biological Integrity
IWM	Intensive Watershed Monitoring
JPA	Joint Powers Agreement
LGU	Local Unit of Government
LWRI	Land and Water Resource Inventory
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MGS	Minnesota Geologic Survey
M-IBI	Macroinvertebrate-Based Index of Biological Integrity
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NRBG	Natural Resources Block Grant
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWIS	National Water Information System
PTMApp	Prioritize, Target and Measure Application
SWCD	Soil and Water Conservation District
TMDLs	Total Maximum Daily Loads
TP	Total Phosphorus
TSS	Total Suspended Solids
U of M	University of Minnesota
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geologic Survey
WCA	Wetland Conservation Act
WRAPS	Watershed Restoration and Protection Strategy
1W1P	One Watershed, One Plan

GLOSSARY

Aquifer – A body of permeable rock that can contain or transmit groundwater.

Baseflow – Sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflow. Natural base flow is sustained largely by groundwater discharges.

Benefitted Properties – The impact a drainage system has on land in terms of improving the market value of the land or the impact (and costs associated with that impact) that the land has on the drainage system because of land use that accelerates drainage, transports sediment or increases volume demand in a drainage system.

Best Management Practice (BMP) – One of many different structural and nonstructural practices and methods that can be used in both agricultural and urban settings that decrease runoff, erosion, and pollutants and improve water quality, soil health, and land use activities.

Calcareous Fen – A rare and distinctive wetland characterized by a substrate of non-acidic peat and dependent on a constant supply of cold, oxygen-poor groundwater rich in calcium and magnesium bicarbonates.

Chlorophyll-a – A green pigment, present in all green plants and in cyanobacteria, responsible for the absorption of light to provide energy for photosynthesis. Typically used to measure the amount of algae present in water.

Climate Change – A long-term change in climate measures such as temperature and rainfall. Changes in climate have a large impact on water quality as well as lake and wetland water levels and stream and river flows.

Community Public Water Supply Wells – A well that serves more than 25 people or has more than 15 piped connections providing water to the public in their primary living space (where people live and sleep; homes, apartments, nursing homes, prisons, etc.)

Contaminants – Substances that, when accidentally or deliberately introduced into the environment, may have the potential to harm living organisms, including people, wildlife and plants.

Dissolved Oxygen – The level of free, non-compound oxygen present in water or other liquids. It is an important parameter in assessing water quality because of its influence on the organisms living within a body of water.

Drainage Authority – A board or joint county drainage authority having jurisdiction over a drainage system or project. (Minn. Stat. § 103E.005, Subd. 9). Pursuant to Minn. Stat. § 103D.625, the managers of a watershed district established pursuant to Minn. Stat. 103D shall take over a joint county or county drainage system within the watershed district and the right to maintain and repair the drainage system if directed by a joint county drainage authority or a county board.

Drainage System – A system of ditch or tile, or both, to drain property, including laterals, improvements, and improvements of outlets, established and constructed by a drainage authority. "Drainage system" includes the improvement of a natural waterway used in the construction of a drainage system and any part of a flood control plan proposed by the United States or its agencies in the drainage system. (Minn. Stat. § 103E.005, Subd. 12.).

Drinking Water Supply Management Area – The surface and subsurface area surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in a wellhead protection plan. This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible.

Drinking Water Supply Management Area Vulnerability – An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from overlying land and water uses. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Escherichia coli (abbreviated as E. coli) – A fecal coliform bacteria that comes from human and animal waste. The Environmental Protection Agency (EPA) uses *E. coli* measurements to determine whether fresh water is safe for recreation.

eLINK – Web-based grant tracking system hosted by the Board of Water and Soil Resources.

Flooding – A general and temporary condition where two or more acres of normally dry land or two or more properties are inundated by water or mudflow (Federal Emergency Management Agency, 2016).

Groundwater – Water located below ground in the spaces present in soil and bedrock.

Groundwater Dependent Natural Resources – Natural resources, especially fens, wetlands, lakes, and streams, whose characteristics would change significantly if they were deprived of groundwater.

Groundwater Recharge – The process of water infiltrating through the ground surface to become groundwater.

Hydrology – The movement of water. Often used in reference to water movement as runoff over the soil after a rainfall event as it contributes to surface water bodies.

Hydrologic & Hydraulic Model – A continuous simulation computer model that predicts natural (hydrologic) and artificial (hydraulic) flow paths, volumes, and rates in a defined area of land.

Impervious Surfaces – Surfaces that severely restrict the movement of water through the surface of the earth and into the soil below. Impervious surface typically refers to man-made surfaces such as non-porous asphalt or concrete roadways, buildings, and heavily compacted soils.

Index of Biotic Integrity (IBI) – A biological assessment tool that provides a framework for translating biological community data into information regarding ecological integrity (“the capability of supporting and maintaining a balanced, integrated, functional organization comparable to that of the natural habitat of the region”, Frey 1977). It utilizes a variety of attributes (“metrics”) of the biological community, each of which responds in a predictable way to anthropogenic disturbance. The metrics are based on ecological traits of the organisms present at a given site, represent different aspects of ecological structure and function, and are scored numerically to quantify the deviation of the site from least-disturbed conditions. When the individual metric scores are summed together, the composite IBI score characterizes biological integrity (Karr et al 1986).

Infiltration – Penetration of water through the ground surface.

Invasive Species – Organisms not endemic to a geographic location. They often displace native species and have the potential to cause environmental change.

Lakeshed – The area of land for which surface runoff drains to the same downstream lake.

Macroinvertebrate – Organisms without backbones, which are visible to the naked eye without the aid of a microscope. Aquatic macroinvertebrates live on, under, and around rocks and sediment on the bottom of lakes, rivers and streams.

Natural Environment Lake – The strictest of three lake classifications found in Minnesota’s Shoreland Management Program. Natural Environment Lakes usually have less than 150 total acres, less than 60 acres per mile of shoreline, and less than three dwellings per mile of shoreline. They may have some winter kill of fish; may have shallow, swampy shoreline; and are less than 15 feet deep. Classification used to determine lot size, setbacks and, to a certain degree, land uses on the adjacent land.

Natural Shoreline – A shoreline with native, deep-rooted vegetation that stabilize erosion, provide wildlife habitat, and filter pollutants from overland runoff.

Nitrate – A negatively charged compound (NO₃⁻) that is water soluble, available for plant uptake, and a product of both organic matter and synthetic fertilizer.

Nonstructural Practices – Annual management practices that directly reduce the amount of pollutants and runoff generated from agricultural fields including cover crops, conservation tillage, and soil health practices.

Nutrients – A group of chemicals that are needed for the growth of an organism. Within surface water systems, nutrients such as phosphorus and nitrogen can lead to the excessive growth of algae.

Nutrient Reduction Strategy – A statewide assessment of nutrient sources and the magnitude of nutrient reductions needed to meet in-state and downstream water quality goals.

Other Waters – Perennial, seasonal streams or drainage ditches excluding watercourses depicted on the DNR Protection map.

Peak flows – Term typically used to define the characteristic high flow period of a stream or river.

Perennial Crops – Crops which are alive year-round and are harvested multiple times before dying (e.g. alfalfa). Conversion of annual fields into perennial fields (perennial cropland) offers many benefits including reduced soil erosion, reduced pollutant loads and reduced irrigation demand.

Pollutant – A substance that makes land, water, air, etc., dirty and not safe or suitable to use.

Pollution Sensitivity – The level of risk of groundwater degradation through the migration of waterborne contaminants.

Prioritization – Determining the relative importance and precedence of the resources and issues identified in the plan. This includes determining what items should be tackled in the first 10-years of the Plan.

Priority Areas – Areas that have been identified by planning partners to focus implementation efforts for restoration or protection. These areas are where planning partners will measure progress towards goals.

Protection – Strategies that protect high quality and threatened resources that are essential to preventing further degradation and future impairment of Minnesota’s waters.

Protection Area – Higher quality areas where preventive measures will be implemented to maintain quality

Public Drainage Systems – A system of ditch or tile, or both, to drain property, including laterals, improvements, and improvements of outlets, established and constructed by a drainage authority. "Drainage system" includes the improvement of a natural waterway used in the construction of a drainage system and any part of a flood control plan proposed by the United States or its agencies in the drainage system. (Minn. Stat. § 103E.005, Subd. 12.).

Public Water Suppliers – Entities that provide water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year.

Radionuclides – Radioactive atoms.

Restoration – Strategies that seek to restore or improve the quality of a resource which is currently impaired, threatened, and/or degraded.

Restoration Area – Low quality areas where improvement activities will be implemented to improve quality.

Riparian – A vegetated ecosystem alongside a waterbody; characteristically have a high water table and are subject to periodic flooding.

Runoff – Water from rain, snow melt, or irrigation that flows over the land surface.

Secchi Depth – Used as a lake monitoring tool. The depth at which an opaque disk, called a Secchi Disk is used to gauge the transparency, and ceases to be visible from the water's surface.

Source Reduction Practices – Best management practices that provide treatment by reducing the amount of water quality constituents, for example, land conversion to perennial vegetation, no-till, cover crops, and nutrient management.

Stakeholder – an individual or group with an interest or concern in watershed management

Stormwater Best Management Practices (BMPs)/Infrastructure – Methods used to control the speed and total amount of stormwater that flows off a site after a rainstorm and used to improve the quality of the runoff water.

Stream Channel – A natural waterway, formed by fluvial processes, that conveys running water.

Stream Connectivity – The term used to define the longitudinal connection a stream has along its length and the lateral connection a stream has with its floodplain and adjacent uplands.

Structural Practices – Long duration constructed practices to treat pollutants and runoff. Common structural practices include water and sediment control basins, alternative tile intakes, rain gardens, cattle exclusions, waste pit closures, grade stabilization, terraces, grassed waterways, wetland restorations, buffer strips, and perennial vegetation.

Subwatershed – A smaller geographic section of a larger watershed unit with a typical drainage area between 2 and 15 square miles and whose boundaries include all the land area draining to a specified point.

Total Maximum Daily Loads (TMDLs) – The total amount of a pollutant or nutrient that a water body can receive and still meet state water quality standards. TMDL also refers to the process of allocating pollutant loadings among point and nonpoint sources.

Total Phosphorus – A measure of the amount of all phosphorus found in a water column, including particulate, dissolved, organic and inorganic forms.

Total Suspended Solids (TSS) – A measure of the amount of particulate material in suspension in a water column.

Turbidity – The cloudiness of the water that is caused by large numbers of individual particles that are generally invisible to the naked eye.

Watershed – An area of land that flows to the same water resource of concern

Watershed Issue - A factor or stressor that results in an adverse impact to a watershed resource of concern.

Water Quality – Water quality is a term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular use. In the case of surface waters, uses are typically swimming and fishing. In the case of groundwater, uses are typically drinking and irrigation.

Wellhead Protection Plan – A plan developed to prevent contaminants from entering an aquifer where a public water supplier draws drinking water.

Zonation – A model that uses geographic information and user input weighting to identify locations on the landscape that have varying degrees of environmental sensitivity or management priority.

1 EXECUTIVE SUMMARY

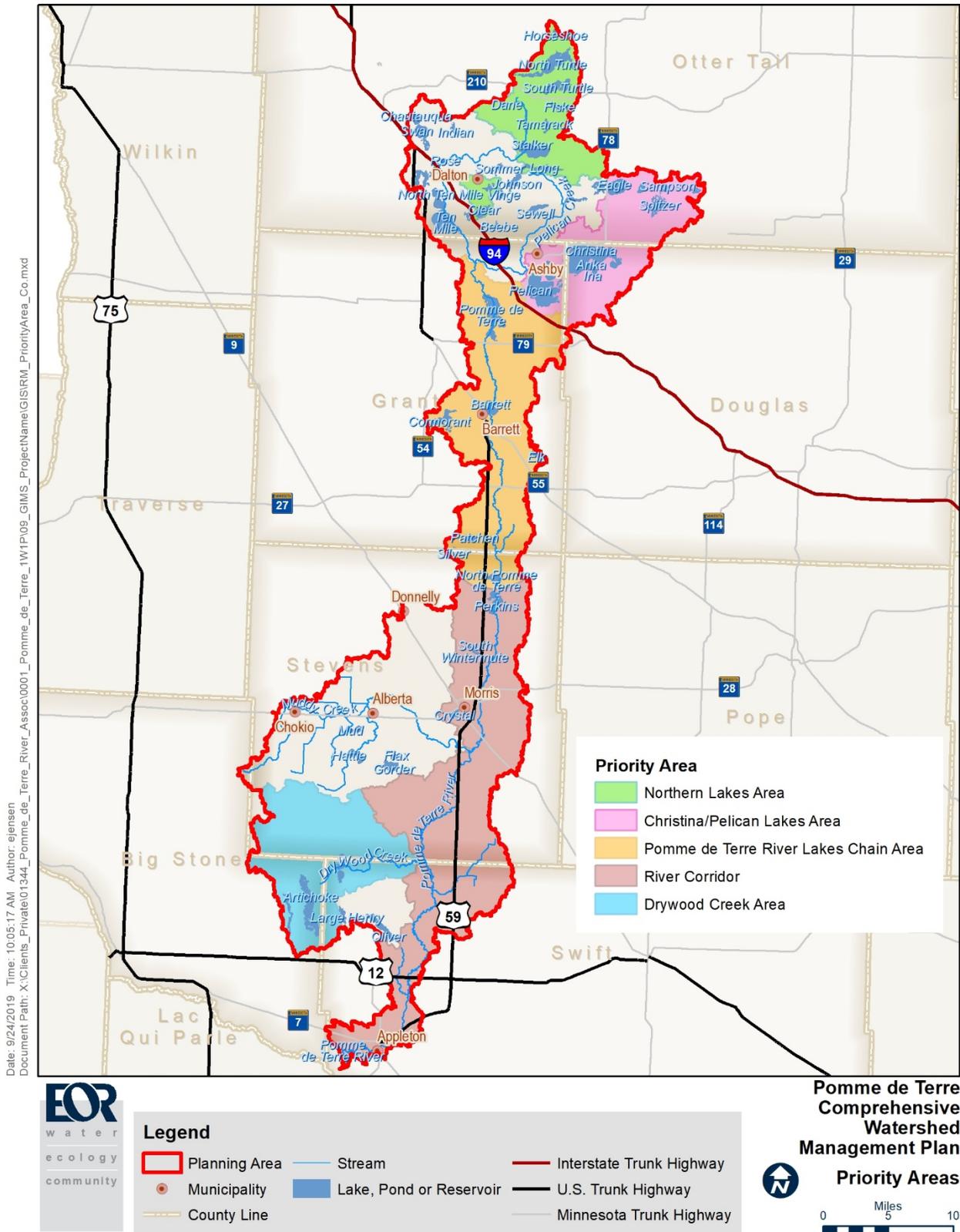
“The mission of the Pomme de Terre River Association is to protect and improve the surface and ground water resources of the Pomme de Terre River Watershed by addressing water quality and quantity issues while also promoting healthy and sustainable agriculture, industrial, and recreational based economy for the region.”

The Pomme de Terre River Association (PDTRA) is a functioning watershed-based entity that provides the ability for both Joint Powers Board members and landowners to address issues on a watershed scale. Founded in 1981, the PDTRA created a partnership between:

- Big Stone County
- Douglas County
- Grant County
- Otter Tail County
- Stevens County
- Swift County
- Big Stone County Soil & Water Conservation District
- Douglas County Soil & Water Conservation District
- Grant County Soil & Water Conservation District
- West Otter Tail County Soil & Water Conservation District
- Stevens County Soil & Water Conservation District
- Swift County Soil & Water Conservation District

The Pomme de Terre River Comprehensive Watershed Management Plan has been developed to meet the requirements of the One Watershed, One Plan (1W1P) program which is described under Minnesota Statute §103B.801. This program supports partnerships of local governments in developing prioritized, targeted, and measurable implementation plans at the major watershed scale. Moving forward with the Comprehensive Watershed Management Plan and implementation, the PDTRA will be the primary entity for plan execution and fiscal responsibilities.

The Pomme de Terre River watershed is located in west central Minnesota. The two largest cities in the watershed are Morris and Appleton. The watershed covers approximately 874 square miles (559,968 acres) of which 74% of the land is used for cropland and pasture. The watershed drains through the Pomme de Terre River, before discharging into the Minnesota River below Marsh Lake. At its headwaters in Ottertail County, the watershed is dominated by lakes and hardwood forests. As the Pomme de Terre River flows south, the landscape transitions to mostly cropland. Within the Minnesota River basin, the Pomme de Terre watershed has some of the best water quality. However, there is still need for improvement as many stream segments and lakes are impaired for aquatic life, recreation and consumption. The Land and Water Resources Inventory (Appendix A) describes important watershed characteristics that set the context for the other plan elements. The Pomme de Terre River Watershed is illustrated in Figure 1-1.



Date: 9/24/2019 Time: 10:05:17 AM Author: ejensen Document Path: X:\Clients_Private\01344_Pomme de Terre River_Assoc\0001_Pomme de Terre_1W1P\09_GIMS_ProjectName\GIS\RM_PriorityArea_Co.mxd

Figure 1-1. Pomme de Terre River Planning Area and Priority Areas

The Plan identifies five priority areas where the majority of the work will be completed in the next 10 years (see Section 2.4 *Prioritizing Issues and Resources*). These priority areas were identified using local values; high-level priorities identified in the state’s Nonpoint Priority Funding plan; various modeling tools (e.g. Zonation conservation model and watershed pollutant loading model results) and current impairment results. The five priority areas include (from north to south):

- *Northern Lakes Area*
- *Christina/Pelican Lakes Area*
- *Pomme de Terre River Lakes Chain Area*
- *Pomme de Terre River Corridor*
- *Drywood Creek Area*

In addition, the Plan identifies 11 priority issues that address:

- *Drinking Water Protection*
- *Groundwater Conservation*
- *Altered Hydrology*
- *Poor Quality Lakes*
- *High Quality Lakes*
- *Protect and Restore Perennial Cover and Shallow Basins*
- *Excess Pollutants*
- *Loss of In-Stream Habitat*
- *Aquatic Invasive Species*
- *Watershed Outreach*
- *Lakeshore Owner Education*

Some priority issues are unique to a priority area and others are an issue for the entire watershed.

The Plan identified 20 measurable goals, which were developed to address the priority issues in the 10-year timeframe of the plan. Specific and targeted implementation activities were identified that are needed to achieve plan goals. Summaries of priority issues, goals and implementation activities by priority area are provided on the following pages.



Pomme de Terre Reservoir - Morris

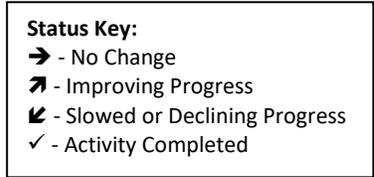
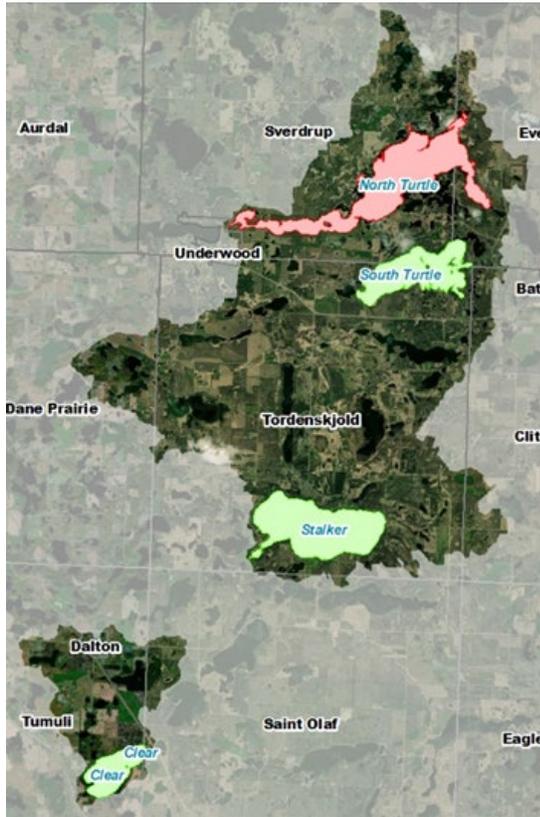
Watershed Wide (All Counties)

Priority	Goal	Implementation Activities	Status
Drinking Water Protection Section 3.1.1	Provide educational resources to private well owners about water testing programs and available treatment options for nitrate and arsenic	Host annual well water nitrate/arsenic testing clinic and coordinate to make testing kits available to the public	
Drinking Water Protection Section 3.1.1	Reduce the number of conduits to the groundwater system (e.g. abandoned wells) to protect groundwater quality by sealing abandoned wells	Provide cost-share assistance to well owners for sealing of unused wells.	
Groundwater Conservation Section 3.1.2	Assist agricultural producers with groundwater conservation by promoting water conservation measures that improve water use efficiencies	Promote and encourage the adoption of irrigation management BMPs	
		Request County Geologic Atlas	
		Identify recharge areas from Atlas	
Altered Hydrology Section 3.2.1	Reduce annual runoff by 0.08 inch of runoff (or 3,527 acre-feet) at the outlet of the Pomme de Terre River watershed	Continue ongoing observation well monitoring	
		Increase perennial vegetation	
		Restore wetlands	
		Implement structural agricultural BMPs	
Altered Hydrology Section 3.2.1	No increase in runoff from public water basins during peak run-off periods	Implement nonstructural BMPs	
		Identify non-contributing areas	
Aquatic Invasive Species Section 3.5.1	Work towards preventing spread of AIS by improving coordination of County programs across the planning area	Pursue management plans for existing and controlled outlets on public water basins	
		Annual workshops to coordinate County AIS plans and implementation	
		Attend DNR District-led meetings	
		Continue implementing education programs	
Watershed Outreach Section 3.6.1	Facilitate strategic networking, learning, and participation of targeted groups to assess, build, and leverage community capacity	Work with local law enforcement agencies on inspections	
		Establish and facilitate Networking/Advisory Groups for targeted groups	
		Establish soil health teams for Northern and Southern Regions with 2 meetings per year	
Watershed Outreach Section 3.6.1	Increase adoption of BMPs by increasing engagement and communication with residents, local landowners and agricultural producers	Regional tours on prioritized portions of the watershed to facilitate partnerships, highlight improvements, and discuss areas	
		BMP-focused demonstrations/workshops	
		Soil health field days	
Watershed Outreach Section 3.6.1	Provide information about how land-use decisions impact the watershed and its resources to locally elected and appointed decision-makers	Continue the work being initiated by the WRAPS Cycle II by identifying a target audience for BMP adoption through follow-up interview on changes made over time	
		Conduct a 5-year watershed tour to re-evaluate progress, reconnect with partners, and create new partnerships	
		Host conversation/meeting on the state of local water quality and watershed management to all types of local and state/federal officials	
Watershed Outreach Section 3.6.1	Encourage soil and water stewardship and awareness across all generations	Create and host consistent orientation to all types of newly elected local officials	
		Coordinate with UMN Extension to Host Aqua Chautauqua within watershed	
		Conduct annual Kayak Tour on the Pomme de Terre River and provide education about streamside ecology	
		Continue K-12 curriculum about watershed management	
		Create a StoryMap to highlight 1W1P plan priority areas and existing conservation practices/programs	
		Create a list serve to share information about the watershed on a routine basis	

Status Key:

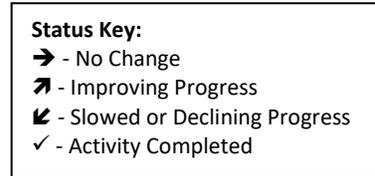
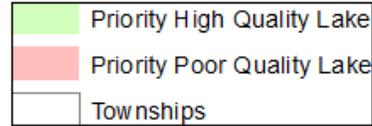
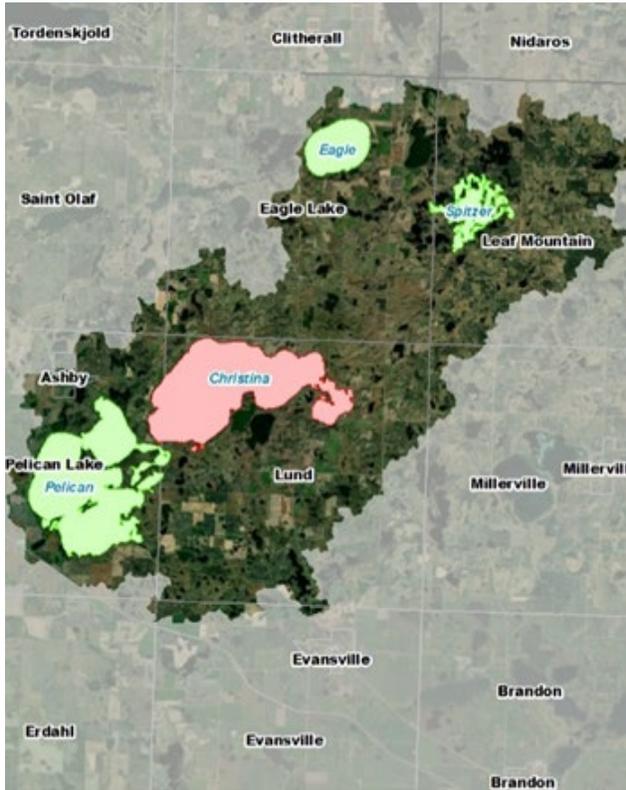
- - No Change
- ↗ - Improving Progress
- ↘ - Slowed or Declining Progress
- ✓ - Activity Completed

Northern Lakes Area (Otter Tail County)



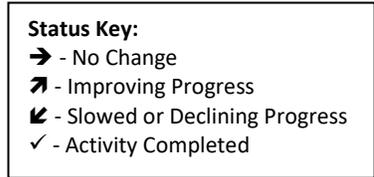
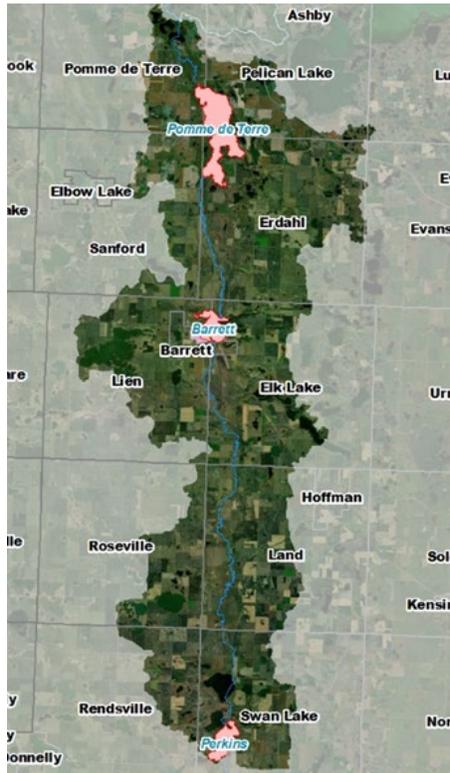
Priority	Goal	Implementation Activities	Status
Poor Quality Lakes Section 3.3.1	Achieve a phosphorus reduction in direct drainage runoff of 57 lb/yr to North Turtle Lake (based on project feasibility)	Series of meetings to identify in-lake management and engage affected landowners	
		Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
High Quality Lakes Section 3.3.2	Achieve a phosphorus reduction in direct drainage runoff of 25 lb/yr to South Turtle Lake, 135 lb/yr to Stalker Lake, and 126 lb/yr to Clear Lake (based on project feasibility)	Implement nonstructural BMPs	
		Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
Lakeshore Owner Education Section 3.6.2	Increase shoreland owner understanding of why there are shoreland regulations and how to be better stewards of the watershed's lakes shoreline	Implement nonstructural BMPs	
		Provide annual lakeshore management education and outreach to lakeshore owners	
		Distribute education materials to existing lakeshore owners in tax mailing	
		Distribute educational materials to new lakeshore owners at property transfer	

Christina-Pelican Lakes Area (Otter Tail, Grant, & Douglas County)



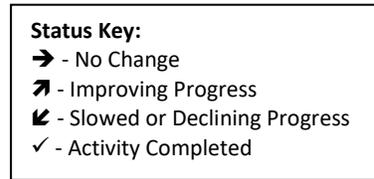
Priority	Goal	Implementation Activities	Status
Poor Quality Lakes Section 3.3.1	Achieve a phosphorus reduction in direct drainage runoff of 59 lb/yr to Lake Christina (based on project feasibility)	Series of meetings to identify in-lake management and engage affected landowners	
		Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
		Implement nonstructural BMPs	
High Quality Lakes Section 3.3.2	Achieve a phosphorus reduction in direct drainage runoff of 14 lb/yr to Eagle Lake, 95 lb/yr to Spitzer Lake, and 29 lb/yr to Pelican Lake (based on project feasibility)	Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
		Implement nonstructural BMPs	
Lakeshore Owner Education Section 3.6.2	Increase shoreland owner understanding of why there are shoreland regulations and how to be better stewards of the watershed's lakes shoreline	Provide annual lakeshore management education and outreach to lakeshore owners	
		Distribute education materials to existing lakeshore owners in tax mailing	
		Distribute educational materials to new lakeshore owners at property transfer	
Protect and Restore Perennial Cover and Shallow Basins Section 3.3.3	Protect existing water quality of shallow basins by maintaining wetland and grassland currently enrolled in conservation programs and increasing the amount of perennial vegetation and wetland storage in the watershed	Implement perennial vegetation and protect wetlands	

Pomme de Terre River Lakes Chain (Grant & Stevens County)



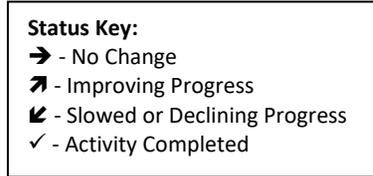
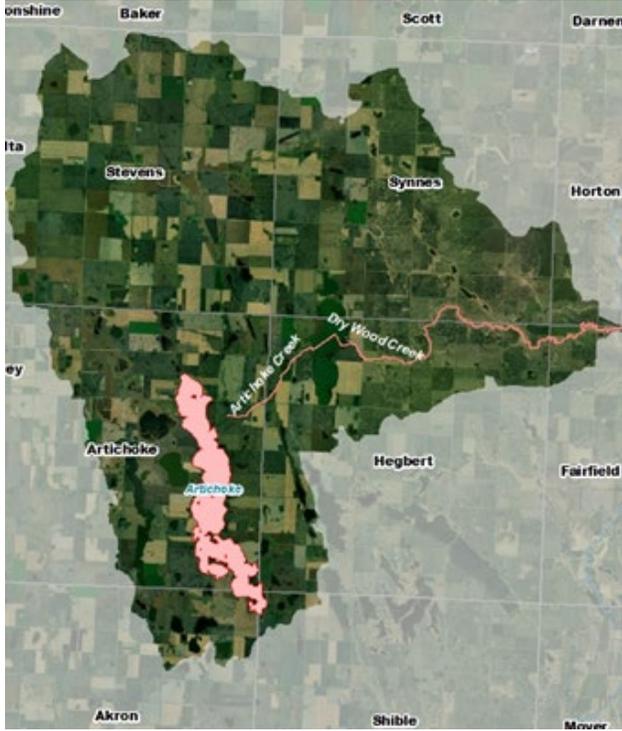
Priority	Goal	Implementation Activities	Status
Drinking Water Protection Section 3.1.1	Protect public drinking water supplies with moderate and high vulnerability (Barrett)	Convert cropland to perennial vegetation	
		Review wellhead protection plans and serve on wellhead protection planning teams	
		Contact landowners about completing BMP projects	
Poor Quality Lakes Section 3.3.1	Achieve a phosphorus reduction in direct drainage runoff of 275 lb/yr to Perkins Lake, 98 lb/yr to Barrett Lake, and 142 lb/yr to Pomme de Terre Lake (based on project feasibility)	Series of meetings to identify in-lake management and engage affected landowners	
		Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
		Implement nonstructural BMPs	
High Quality Lakes Section 3.3.2	Achieve a phosphorus reduction in direct drainage runoff of 4 lb/yr to Elk Lake (based on project feasibility)	Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
Lakeshore Owner Education Section 3.6.2	Increase shoreland owner understanding of why there are shoreland regulations and how to be better stewards of the watershed's lakes shoreline	Implement nonstructural BMPs	
		Provide annual lakeshore management education and outreach to lakeshore owners	
		Distribute education materials to existing lakeshore owners in tax mailing	
		Distribute educational materials to new lakeshore owners at property transfer	

Pomme de Terre River Corridor (Stevens & Swift County)



Priority	Goal	Implementation Activities	Status
Drinking Water Protection Section 3.1.1	Protect public drinking water supplies with moderate and high vulnerability (Morris and Appleton)	Convert cropland to perennial vegetation	
		Review wellhead protection plans and serve on wellhead protection planning teams	
		Contact landowners about completing BMP projects	
Excess Pollutants Section 3.4.1	Achieve a phosphorus reduction of 382 lb/yr and a sediment reduction of 2,501 tons/yr in direct runoff to the Pomme de Terre River	One-on-one conversations with landowners to enroll in cost-share programs for top-ranked structural and non-structural practices	
		Implement structural agricultural BMPs	
		Implement nonstructural BMPs	
		Restore drained shallow basins	
		Implement nutrient management plans	
Excess Pollutants Section 3.4.1	Reduce stormwater runoff impacts	Implement BMPs associated with urban stormwater runoff (e.g., rain gardens)	
		Work with cities to develop stormwater management plans in urban areas	
Loss of In-Stream Habitat Section 3.4.2	Improve in-stream habitat by reducing sedimentation due to stream bank erosion	Implement BMPs to reduce erosion due to livestock	
		Implement pasture management and rotational grazing plans	
		Complete streambank stabilization projects	
		Implement side water inlets where appropriate	
Loss of In-Stream Habitat Section 3.4.2	Improve riparian habitat by establishing and maintaining perennial buffers and floodplain connections	Implement buffer on “other waters” coming into the main stem of the Pomme de Terre River	

Drywood Creek Area (Stevens, Swift, & Big Stone County)



Priority	Goal	Implementation Activities	Status
Poor Quality Lakes Section 3.3.1	Achieve a phosphorus reduction in direct drainage runoff of 99 lb/yr to Artichoke Lake (based on project feasibility)	Series of meetings to identify in-lake management and engage affected landowners	
		Inspect subsurface sewage treatment systems	
		Update noncompliant septic systems	
		Conduct shoreline condition inventories	
		Implement shoreline restoration projects for erosion control	
		Implement structural agricultural BMPs	
Excess Pollutants Section 3.4.1	Achieve a phosphorus reduction of 209 lb/yr and a sediment reduction of 1,029 tons/yr in direct runoff to Drywood Creek	Implement nonstructural BMPs	
		One-on-one conversations with landowners to enroll in cost-share programs for top-ranked structural and non-structural practices	
		Implement structural agricultural BMPs	
		Implement nonstructural BMPs	
		Restore drained shallow basins	
Loss of In-Stream Habitat Section 3.4.2	Improve in-stream habitat by reducing sedimentation due to stream bank erosion	Implement nutrient management plans	
		Implement ag. pit closures	
		Implement BMPs to reduce erosion due to livestock	
		Implement pasture management and rotational grazing plans	
Loss of In-Stream Habitat Section 3.4.2	Improve riparian habitat by establishing and maintaining perennial buffers and floodplain connections	Complete streambank stabilization projects	
		Implement side water inlets where appropriate	
		Implement buffer on "other waters" coming into the main stem of the Pomme de Terre River	

All of the plan elements will be implemented by the Counties and SWCDs under a Joint Powers Agreement (JPA) that describes the structure of the Pomme de Terre River Association Joint Powers Board (PdTRA JPB). The PdTRA JPB is a watershed based entity within the Pomme de Terre River Watershed that provides the ability for both JPB members and land occupiers to address issues on a watershed scale rather than by individual geographical areas of each local unit of government. Table 1-1 identifies the roles of the Pomme de Terre River Association Joint Powers Board and Staff as well as the Technical Advisory Committee in plan implementation.

Staff representatives from each of the JPB members will coordinate the implementation of plan activities and collaborate to obtain the grants and funding necessary to implement the plan. The Joint Powers Board and Staff will meet regularly to ensure progress is being made toward achieving the goals of the plan. The Technical Advisory Committee will be called to provide expertise, assist in work plan development and implementation and to assist with performance-tracking.

Table 1-1. Anticipated roles for plan implementation to be incorporated into governance structure.

Entity	Primary Implementation Role/Function
<p>Pomme de Terre River Association Joint Powers Board</p>	<ul style="list-style-type: none"> - Adopting the Plan - Implementation of the Plan - Amending the Plan - Allocating funding sources - Approving work plans - Approving contractual agreements - Approving fiscal reports and budgets - Approving reports required by BWSR - Approve grant applications and accept grant funds - Approve assessment on plan progress and measurable results - Establish committees
<p>Pomme de Terre River Association Staff</p>	<ul style="list-style-type: none"> - Prepare work plan - Prepare fiscal reports and budgets - Prepare reports required by grantors - Prepare and submit grant applications - Complete assessment on plan progress and measure results - Provide general administrative and fiscal functions
<p>Technical Advisory Committee</p>	<ul style="list-style-type: none"> - Provide expertise and scientific data - Develop recommendations for Plan Implementation - Assist with work plan development and implementation - Identify and coordinate grant opportunities - Assist with assessment on plan progress and measure results - Provide recommendations to the PdTRA JPB
<p>Individual County Boards and Soil and Water Conservation Districts</p>	<ul style="list-style-type: none"> - Approving the Plan prior for submittal to the Board of Water and Soil Resources - Local Adoption of the Plan - Implementation of the Plan

2 PRIORITIZATION OF ISSUES AND RESOURCES

According to the Minnesota Board of Water and Soil Resources guidance, this part of the planning process of prioritizing issues and resources should result in:

“A prioritized list of issue statements that clearly convey the most pressing problems, risks, and opportunities facing the watershed, and maps depicting locations of priority resources”.

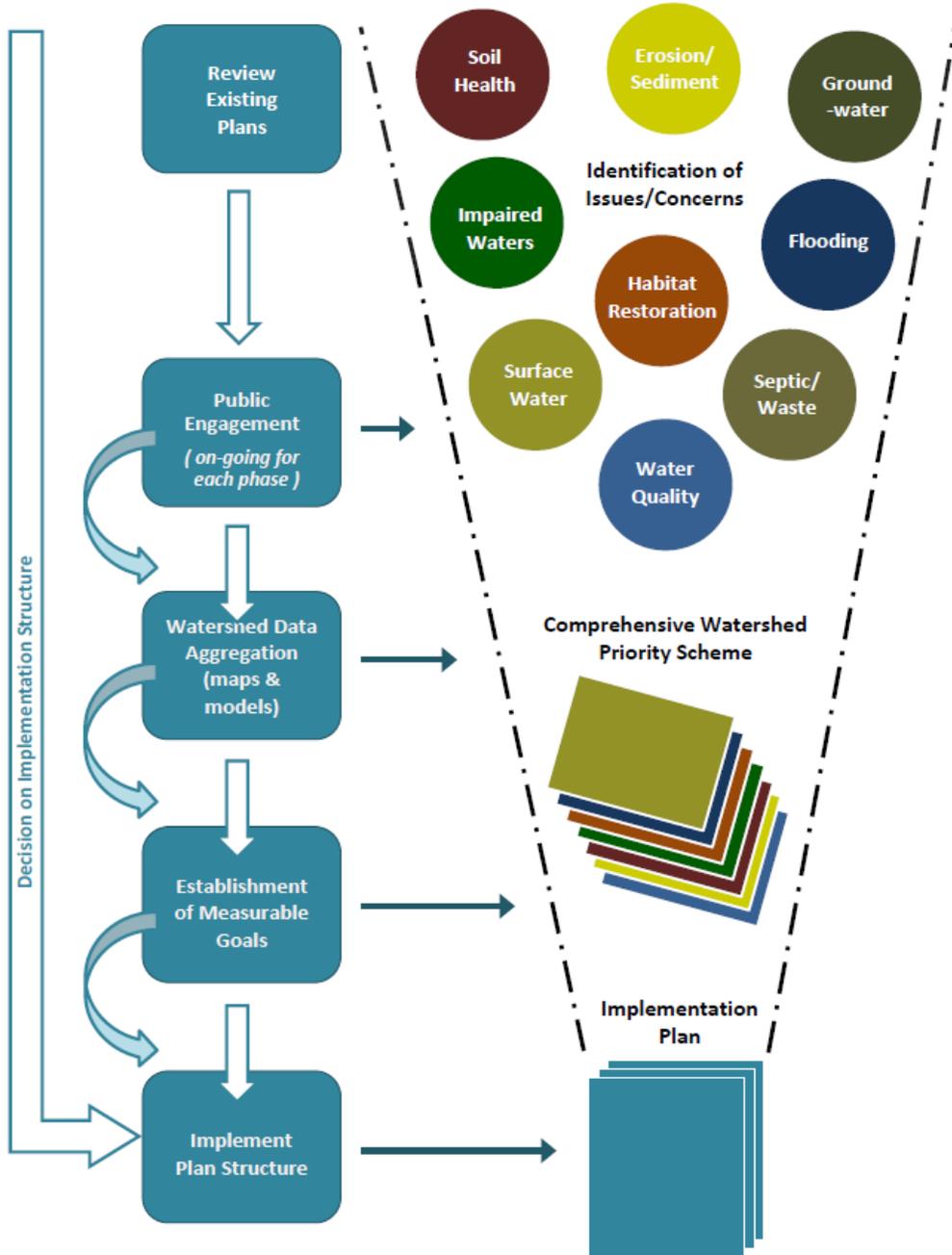


Figure 2-1. Schematic of the Comprehensive Watershed Management Planning Process

This section of the Plan describes the process the Planning Partners used to identify the watershed concerns and issues that will be addressed within the 10-year timeframe of this Plan (generally depicted in Figure 2-1). Not every issue can be addressed everywhere in the watershed within the timeframe of the plan, therefore the prioritization process addresses both “what” issues are a priority and “where” on the landscape these issues should be addressed first (Figure 2-2). For example, lake eutrophication may be identified as a priority issue to address in the Pomme de Terre River Watershed, but a smaller subset of impaired lakes will be targeted for implementation practices within the 10-year timeframe of the plan. Priority issues were identified first, and then priority areas were identified within the Pomme de Terre River Watershed to focus implementation efforts that address the priority issues.

At the start of the planning process, the Policy, Planning, and Citizen’s Advisory Committee attended an organized Bus Tour of the watershed where members presented watershed concerns, issues and existing conservation practices. Members of the Citizens Advisory Committee and other members of the public were invited to participate in a series of three Water Conversations where smaller work groups discussed issues and concerns related to water resources management, provided feedback on priority areas, and reviewed measurable goals and suggested implementation strategies within the communities they represented.

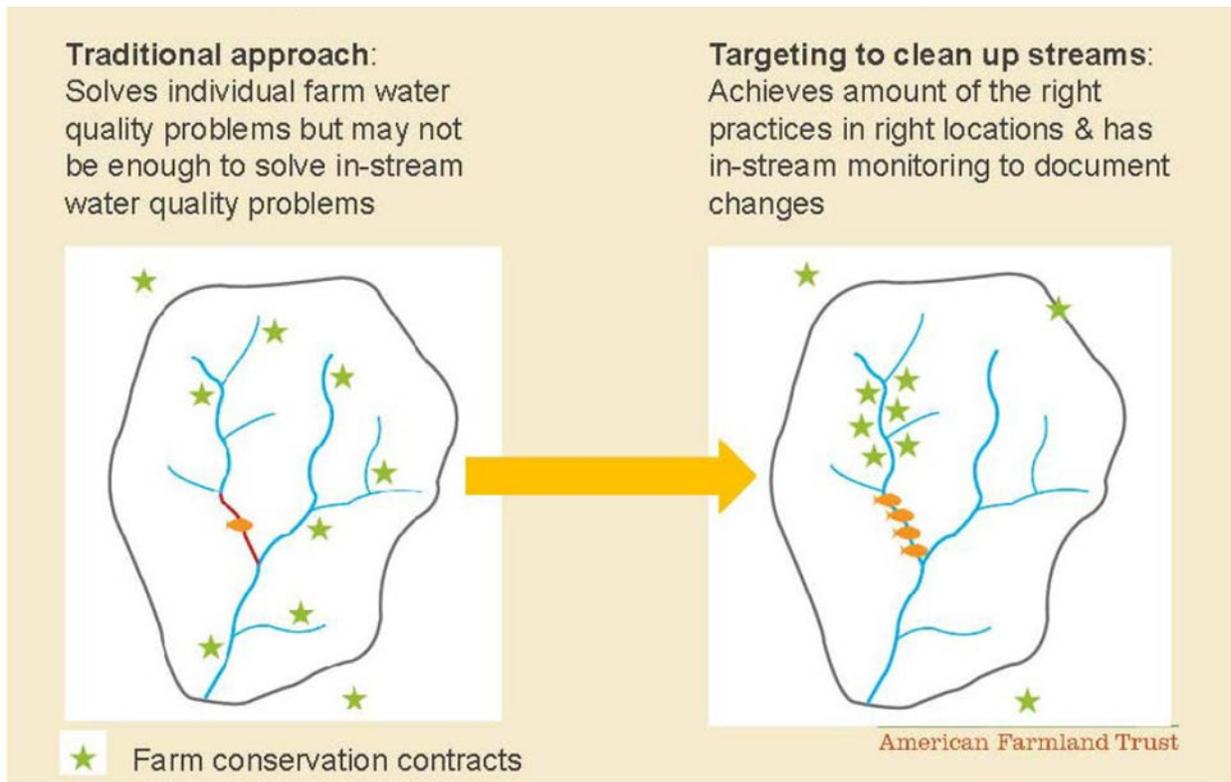


Figure 2-2. Best management practice targeting illustration to achieve measurable reductions in water quality

2.1 PRIORITIZING ISSUES

The process of identifying a comprehensive list of watershed issues and concerns involved significant review and incorporation of existing local and regionally-relevant plans and studies. In total, over 50 documents were compiled and reviewed to inform the Pomme de Terre River Comprehensive Watershed Management Plan planning process (Appendix B), including notification letters from plan review authorities and other stakeholders with priority issues and concerns for consideration in the plan development process.

From the comprehensive list of watershed issues and concerns, the Planning Partners identified eleven priority issues that will be addressed with specific goals and implementation activities within the 10-year timeframe of the Plan:

- *Drinking Water Protection*
- *Groundwater Conservation*
- *Altered Hydrology*
- *Poor Quality Lakes*
- *High Quality Lakes*
- *Protect and Restore Perennial Cover and Shallow Basins*
- *Excess Pollutants*
- *Loss of In-Stream Habitat*
- *Aquatic Invasive Species*
- *Watershed Outreach*
- *Lakeshore Owner Education*



2.2 PRIORITIZING AREAS FOR IMPLEMENTATION

The comprehensive watershed priority model is a process developed to rank where on the landscape priority issues and concerns need to be addressed within the watershed. The comprehensive watershed priority model uses the output from a variety of modeling and prioritization tools, and other watershed characteristics, represented as a series of maps. These maps highlight commonalities and differences in the spatial distribution of restoration and protection needs across the watershed. A priority area is an area where a number of restoration and protection areas are concentrated. The models and tools used to guide the prioritization process in the Pomme de Terre River Watershed are listed in Table 2-1. In addition, the Planning Partners considered what could reasonably be achieved within the timeframe of the Plan, and secondary benefits to downstream resources. For example, the improvements in the headwaters to the Pomme de Terre River have benefits to resources located downstream, and improvements in the Pomme de Terre River Watershed have benefits to the Minnesota River and the Mississippi River.

Table 2-1. Comprehensive Watershed Priority Model feature description and resources

Comprehensive Watershed Priority Model Feature	Resource	Description
Impaired or fully supporting lakes and streams	2013 Pomme de Terre River Watershed Restoration and Protection Strategies report	Aquatic Life Use and Recreation Use support maps
Priority Management Zones	2013 Pomme de Terre River Watershed Restoration and Protection Strategies report	Priority management zones for Buffers, Severe Erosion Sites, Shoreline Stabilization, Stormwater Control and Wetland Restoration
Nearly or barely impaired lakes Improving or declining trends in water quality	2017 Minnesota Pollution Control Agency Lake Water Quality Assessment	In-lake phosphorus concentrations near the water quality standards, and long-term trends in lake and stream water quality
Conservation Priority Areas	2017 Pomme de Terre River Zonation Tool	A value-based model for prioritizing areas for watershed management: Protecting Groundwater, Reducing Erosion & Runoff, Protecting/Improving Lakes & Rivers, Lands of Concern, and Fish & Wildlife Habitat. Detailed information regarding the Zonation conservation prioritization software can be found in Appendix C.
High sediment, phosphorus or water yields	Pomme de Terre River Watershed Hydrologic Simulation Program-Fortran watershed pollutant loading model (1995-2009)	Long-term annual average magnitude of pollutants (as pounds per acre per year) or water (as inches per acre per year) discharged by each subwatershed to surface water resources
Locations of existing BMPs	County and Soil and Water Conservation District data	Water and sediment control basins, rain gardens, alternative tile intakes, etc.
Locations of existing easements	County and Soil and Water Conservation District data	Wildlife Production Area, Scientific & Natural Areas, Prairie Bank, Nature Conservancy, Reinvest In Minnesota, Wildlife Management Areas, etc.

Five key areas were identified through the Comprehensive Watershed Priority Model that have a concentration of restoration and protection priorities (Figure 2-3 and Figure 2-4).

- Northern Lakes Area:** Selected for its highly valued lakes and the need to minimize impacts from future lakeshed development. North Turtle Lake is impaired for nutrients and suffers from intense seasonal algae blooms, while Clear, Stalker, and South Turtle Lakes currently have high quality water and habitat.
- Christina/Pelican Lakes Area:** Selected for its highly valued lakes and the need to minimize impacts from future lakeshed development. Eagle and Spitzer Lakes currently have high water quality. Christina Lake is an important lake for waterfowl but is impaired for nutrients and impacts the water quality of downstream Pelican Lake, which is highly valued for recreational opportunities. This area was also selected because of the concern of high

lake levels and the need to increase storage on the landscape through the protection and restoration of wetlands and grasslands.

- **Pomme de Terre River Lakes Chain Area:** Selected for its highly valued lakes for recreational opportunities, and the need to minimize impacts from existing and future land use practices. Pomme de Terre, Barrett, and Perkins Lakes are impaired for nutrients. This lake chain is located along the Pomme de Terre River mainstem, and therefore have a large impact on downstream river water quality.
- **Drywood Creek Area:** Contains a number of resources that are impaired for or being impacted by high pollutant loads, such as nutrients, sediment, and bacteria. There are also a number of shallow basins important to migratory bird habitat that need restoration and/or protection.
- **Pomme de Terre River Corridor:** Encompasses the direct drainage area to the lower Pomme de Terre River which is impaired for turbidity, aquatic life, and bacteria. The lower Pomme de Terre River passes through the City of Morris and flows into the Minnesota River south of Appleton. Sediment runoff, bank de-vegetation, and erosion have resulted in a loss of riparian habitat and floodplain connections along the Pomme de Terre River Corridor.

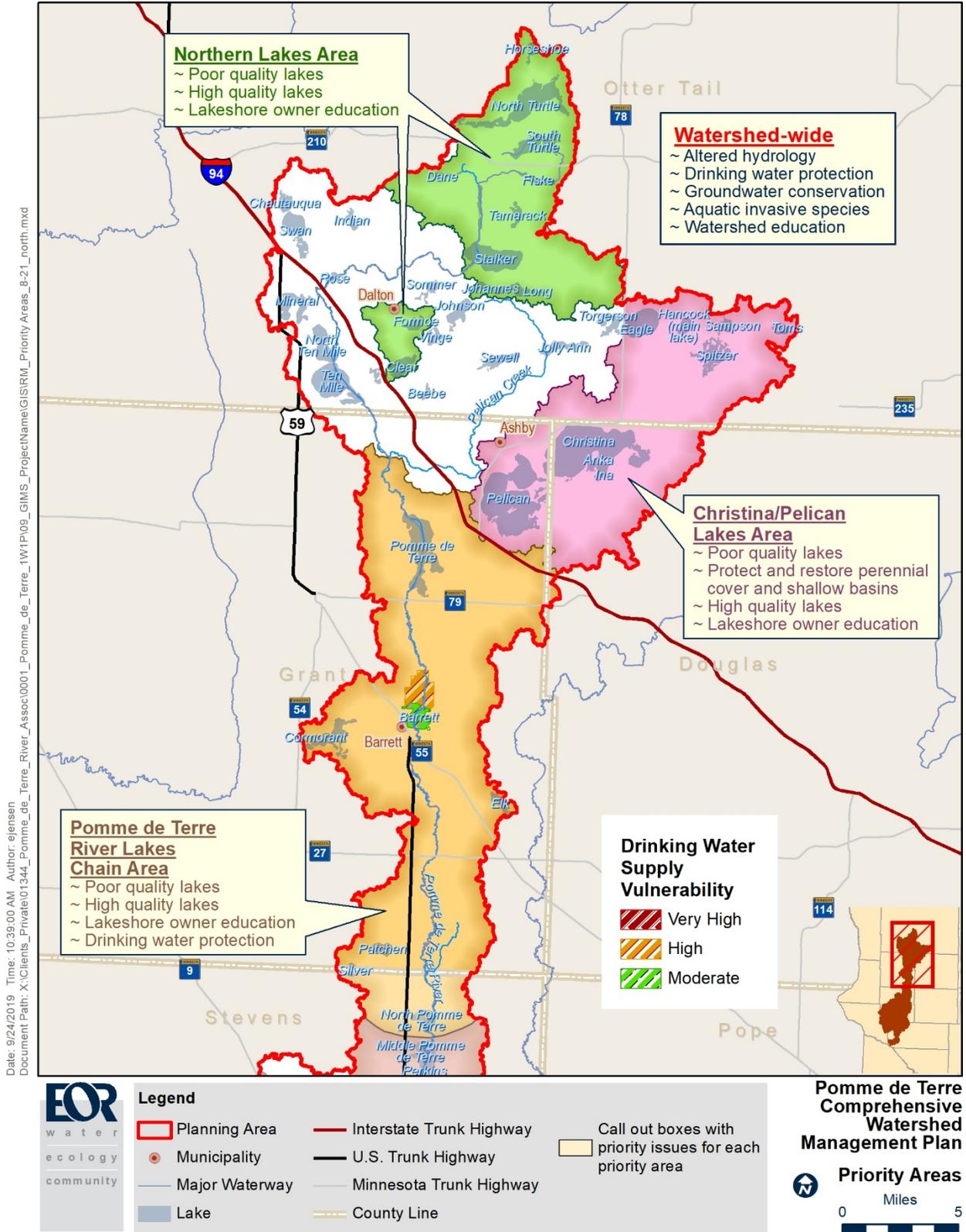
The Planning Partners also identified a number of issues that require action on a watershed-wide scale. For example, altered hydrology impacts occur across the watershed and land use practices need to be implemented across the watershed.

2.3 IDENTIFYING MEASURABLE GOALS

The measurable goals articulate the level of improvement in each priority resource the Planning Partners would like to achieve by the end of the 10-year timeframe of the Plan. Goals from existing local water plans and other documents were considered for inclusion in the plan as well as the institutional knowledge of staff and key stakeholders in the area. In addition, WRAPS, TMDLs and a suite of modeling tools were used to identify goals and the level of implementation needed to achieve those goals. The Planning Partners formed subcommittees to develop measurable goals and identify implementation activities for a set of related issues.

2.4 SUMMARY

The priority issues and resources were assigned specific goals and implementation activities to be completed within the 10-year timeframe of the plan, as summarized in Section 3. Within each Priority Area, implementation efforts were further focused within targeted implementation areas to achieve the measurable goals identified for the priority resources over the 10-year timeframe of the plan. Watershed management requires an adaptive management approach, and the relative importance of the resources and issues may change over the 10-year period of the Plan. The Planning Partners will consider these factors during annual work planning, as described in Section 6.4.



Date: 9/24/2019 Time: 10:39:00 AM Author: ejensen Document Path: X:\Clients_Private\01344_Pomme de Terre_River_Assoc\0001_Pomme de Terre_1W1P\09_GIMS_ProjectName\GIS\RM_Priority Areas_8-21_north.mxd

Figure 2-3. Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Northern Region)

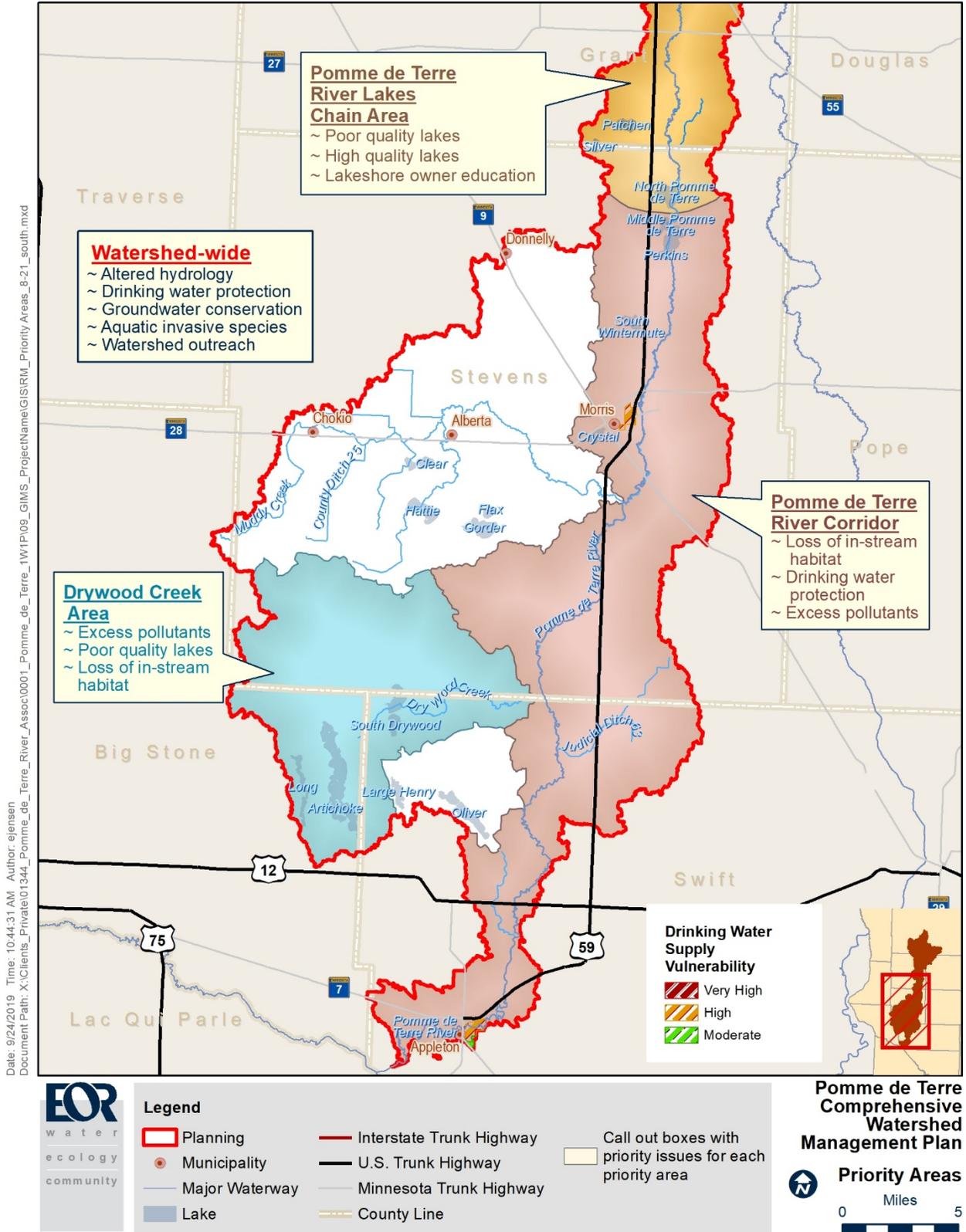
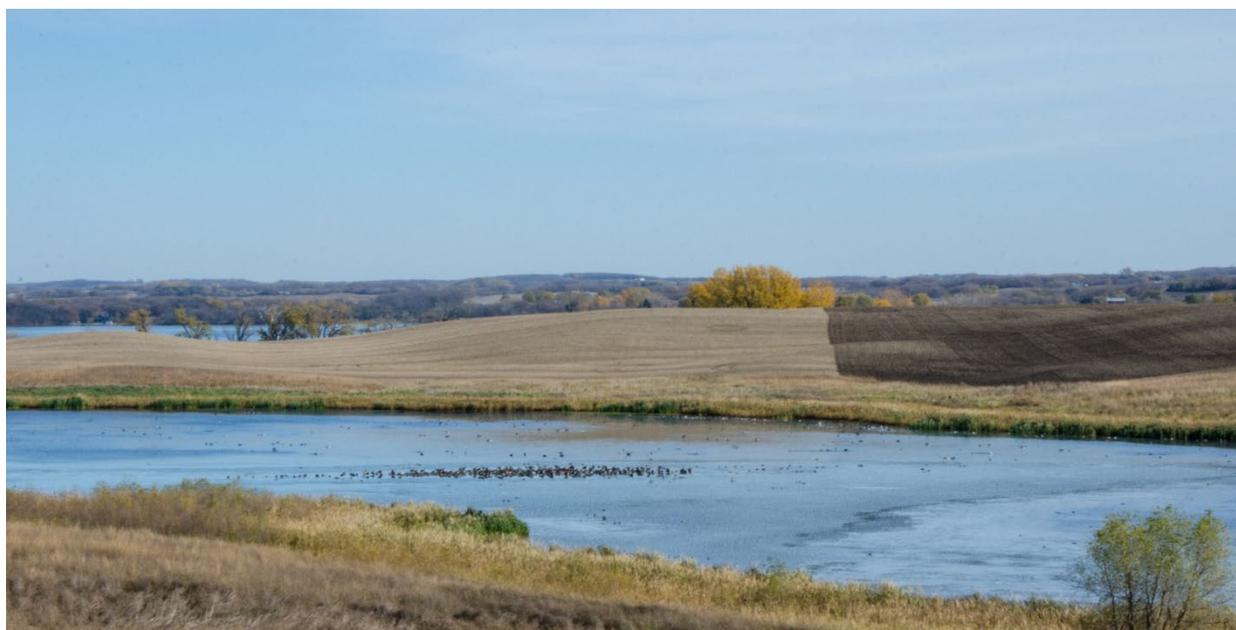


Figure 2-4. Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Southern Region)

3 ISSUES, GOALS AND IMPLEMENTATION ACTIVITIES

After issues were defined, the Planning Partners created issue statements to better communicate the idea of each issue. Goals and implementation activities were later developed that aligned with the issue statements. Issues are grouped by Hydrology; Groundwater; Lakes, Wetlands, and Shallow Basins; Rivers; Ecosystem Health; and Socioeconomic Factors. For each issue, the following information is provided:

1. **Issue Statement:** For each Priority Issue, the Issue Statement includes a more refined description of each sub-issue as it relates to the priority area(s).
2. **Priority Area Summary:** Identification of the specific implementation area(s) within the broader priority areas for this issue and a brief description of why this area(s) was identified as a priority for the first 10-year timeframe of the Pomme de Terre River Comprehensive Watershed Management Plan.
3. **Desired Future Condition (Long-term Goals):** Statement describing the desired long-term, future condition of a priority resource, regardless of timeframe.
4. **10-Year Measurable Goals:** The quantifiable change expected in a priority resource after implementing the first 10-year plan (2021-2030).
5. **Justification for the Goals:** Explanation of how the Planning Partners established the 10-year goals for the Pomme de Terre River Comprehensive Watershed Management Plan.
6. **Targeted Implementation Activities:** Implementation activities that will achieve the measurable goal(s). These are countable projects, activities, services, or products that can be tracked as progress towards achieving the goals. Note that some implementation activities address more than one issue and achieve more than one goal. Costs for these implementation activities are listed only once in the implementation table, but a description of the implementation activity is noted under each issue they address in the written Plan.
7. **Pace of Progress:** Summary of how the 10-year goal will be achieved by implementing the corresponding Targeted Implementation Activities.



3.1 GROUNDWATER

Groundwater accounts for the majority of water that is pumped to meet agricultural, industrial, public and private drinking water and natural resource needs. There are three Community Public Water Supply Wells that have high to moderate potential contaminant risk. Some Private drinking water wells contain contaminants such as nitrates. Several groundwater-dependent natural resources including calcareous fens, designated trout streams and other unique and sensitive native plant communities requires an adequate supply of high quality groundwater.

3.1.1 Drinking Water Protection

Issue Statement and Background

Of the nine community public water supply wells, three are located in high to moderate Drinking Water Supply Management Area vulnerability settings: Appleton (population 1,412), Barrett (population 415) and Morris (population 5,205). There are also 54 non-community public water suppliers and over 1,300 domestic water supply wells in the Pomme de Terre watershed. These suppliers provide drinking water to people at their places of work, gather or play (schools, offices, campgrounds, churches, etc.). One concern for drinking water in the Pomme de Terre River watershed is high arsenic levels, which occurs naturally in rocks and soil across Minnesota and can dissolve into groundwater. There are a couple of private wells in the northern portion of the Planning Area with nitrate concentrations at or above the Health Risk Level of 10 mg/L (Final Township Testing Nitrate Report: Otter Tail County, 2015-2017). *Nitrate levels could become a greater concern for drinking water if land use isn't managed properly. In addition, unsealed abandoned wells could contribute to the contamination of the drinking water supply.*

Priority Area Summary

Communities with high or moderate vulnerabilities, private well owners in areas of moderate or high pollution sensitivity, and areas with nitrate readings of 3ppm or higher.

Desired Future Condition (Long-Term Goal):

Partner with the state to establish/track long-term monitoring of groundwater arsenic and nitrate concentrations. Public and private wells with safe and adequate drinking water.

10-Year Measurable Goals:

- Goal 1:** Protect public drinking water supplies with moderate and high vulnerability with best management practice technical assistance in Appleton, Morris, and Barrett.
- Goal 2:** Provide educational resources to private well owners about water testing programs and available treatment options for nitrate and arsenic.
- Goal 3:** Reduce the number of conduits to the groundwater system (e.g. abandoned wells) to protect groundwater quality by sealing abandoned wells.

Justification for Goals:

During the plan development process, the MN Department of Health consulted with the cities of Morris, Appleton and Barrett. Communities indicated that they could use assistance finding and sealing wells in their Drinking Water Supply Management Area (DWSMA).

To ensure that homeowners have safe drinking water, the Planning Partners will host annual well screening clinics.

Since complete inventory of abandoned wells has not been performed to date, the goal of sealing 134 wells was established using past well-sealing records for Stevens and Swift SWCDs.

Targeted Implementation Activities:

- Conversion of 500 acres of cropland to perennial vegetation through perpetual easements or 10 to 15 year contracts.
- SWCD Staff will review wellhead protection plans and maintain/improve coordination with Cities on partnering opportunities. Staff will also serve on wellhead protection planning teams.
- Contact landowners about completing BMP projects within Drinking Water Supply Management Areas.
- Host annual well water nitrate and arsenic testing clinics and coordinate with environmental labs to have nitrate and arsenic testing kits available to the public.
- Provide cost-share assistance to 134 well owners for sealing of unused wells. Prioritizing moderate and high pollution sensitivity areas and Drinking Water Supply Management Areas.

Pace of Progress:

Table 3-1 outlines the measures for determining the progress towards the 10-year measurable goals for Drinking Water Protection.

Table 3-1. Pace-of-Progress Measures for Drinking Water Protection

Type of Project	Measure for Pace-of-Progress
Cropland Conversion	Track the number of acres enrolled in DWSMAs
Wellhead Protection Planning	Attendance at Wellhead Protection Planning meetings
Education and Outreach: BMPs in DWSMAs	Number of landowners contacted in DWSMAs
Education and Outreach: Host drinking water testing clinics	Number of clinics/workshops held and request trend analysis from MDH every five years
Well Sealing	Completed inventory of unsealed wells and number of participants in cost-share program

3.1.2 Groundwater Conservation

Issue Statement and Background

There are a number of natural resources in the Pomme de Terre watershed that are wholly or partially dependent upon groundwater, including: calcareous fens, a tullibee lake (Stalker), groundwater-dependent lakes and plant communities, baseflow in the Pomme de Terre River, and one trout stream (Long Lake Creek just north of Long Lake in Otter Tail County). In addition, industry, agriculture, and business uses depend on groundwater. There are 185 agricultural irrigation wells, five golf course wells and five industrial processing wells in the Pomme de Terre River Watershed. *The lack of groundwater data and evaluation makes it*

difficult to understand trends in surface/groundwater interactions and groundwater quantity. An evaluation is needed to better characterize surface water/groundwater interactions and assess where additional information needs to be collected.

Priority Area Summary

Goals for groundwater conservation are based on data collection and analysis, implementation of conservation practices, and will be addressed watershed-wide.

Desired Future Condition (Long-Term Goal):

Sufficient groundwater is available in the Pomme de Terre Watershed to support a healthy natural resource base and economic uses. In addition, there is sufficient groundwater data to characterize quality and quantity trends.

10-Year Measurable Goals:

- Goal 1:** Assist agricultural producers with groundwater conservation by promoting water conservation measures that improve water use efficiencies
- Goal 2:** Fill groundwater monitoring data gaps through request of the County Geologic Atlas and continuation of ongoing observation well monitoring efforts.

Justification for Goals:

Groundwater is important for the surface waters and natural resources of the watershed as well as for irrigation, industry and drinking water. The first step in developing a sustainable groundwater management plan is the development of a groundwater information database, which includes a water budget. It will take a collaborative approach to develop a sustainable groundwater management system through raising awareness of water conservation practices and collecting groundwater information.

Targeted Implementation Activities:

- Promote and encourage the adoption of irrigation water management BMPs that increase water conservation and decrease conditions for nitrogen loss.
- Counties will request the County Geologic Atlas, including staff time to locate wells to support atlas development.
- Identify and focus BMPs/conservation on recharge/vulnerable areas identified from the hydrogeologic section of the County Geologic Atlas (Section B).
- Continue ongoing observation well monitoring efforts.

Pace of Progress:

Table 3-2 outlines the measures for determining the progress towards the 10-year measurable goals for Drinking Water Protection.

Table 3-2. Pace-of-Progress Measures for Groundwater Conservation

Type of Project	Measure for Pace-of-Progress
Irrigation Water Management BMPs	Invest 40 hours per year to target fields with irrigation scheduling plans or flow regulation
Increase acreage enrolled in conservation programs	Track the number of acres enrolled

Type of Project	Measure for Pace-of-Progress
County Geologic Atlas	Number of counties with the development of Geologic Atlas in progress
BMPs on recharge/vulnerable areas	Recharge and vulnerable areas identified
Observation Well Monitoring	Number of observation wells monitored per year

3.2 HYDROLOGY

3.2.1 Altered Hydrology

Issue Statement and Background

Altered Hydrology is the change in the river’s water balance and hydrologic regime. This regime is influenced by a loss of water storage (including soil and wetlands water storage) and increased impervious surfaces.

The Pomme de Terre River watershed’s hydrology has changed over the last 90 years. Because of several broad factors, the landscape has transitioned from perennial to agricultural landcover impacting infiltration rates and evapotranspiration patterns. These hydrologic changes will be further exacerbated by climate change. *There has been a loss of wetland, soil water holding capacity, and increased impervious surfaces on the landscape impacting infiltration and river flows.* Streams have been transformed into efficient drainage systems that quickly remove excess water for agricultural production and/or development. There has also been a change in the amount of rainfall and an increase in the severity of rainstorms. The combination of environmental and landscape changes has led to increased surface runoff, a change in the timing and magnitude of river flows and a degradation of aquatic habitat. These alterations of the river’s water balance and hydrologic regime are summarized by the term “altered hydrology”.

Priority Area Summary

Altered hydrology needs to be addressed at the watershed-scale.

Desired Future Condition (Long-Term Goal):

Reduce annual runoff by 0.5 inch over the entire watershed.

10-Year Measurable Goals:

Goal 1: Reduce annual runoff by 0.08 inch of runoff (or 3,527 acre-feet) at the outlet of the Pomme de Terre River watershed.

Goal 2: No increase in runoff from public water basins during peak run-off periods.

Justification for Goals:

Goals were established by reviewing the annual runoff volume measured at USGS 05294000 Pomme de Terre River at Appleton, MN. According to this information, the average annual runoff from 1949-2017 has increased 1.5 inches. Increases in runoff are due to three factors: climate, land use and altered hydrology (e.g. changes in storage and drainage). The Planning Partners decided to establish a goal based on how much additional storage they could

reasonably achieve within 10 years. Practices that add storage on the landscape will also mitigate future hydrologic changes from climate change. Additionally, the Planning Partners did not establish a goal for drainage system management since less than 10% of the watershed utilize public drainage systems and half of the area served is in Stevens County. Opportunities to engage Drainage Authorities are addressed elsewhere in the Plan (e.g. Socioeconomic Factors).

Targeted Implementation Activities:

- Implement 20,840 acres of perennial vegetation including the use of state and federal conservation programs, inclusive of 500 acres that are specific to the Drinking Water Protection priority areas.
- Complete 2,920 acres of wetland restoration, inclusive of 2,720 acres that will be targeted within priority areas.
- Implement 581 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment inclusive of 383 practices that will be targeted within priority areas.
- Implement 9,340 acres of nonstructural BMPs based on PTMApp and best professional judgment inclusive of 7,370 acres that will be targeted within priority areas.
- Identify previously completed BMPs and create spatial database, develop database for tracking projects in the future.
- Identify public water basins that do not flow to the Pomme de Terre River and may exceed the ordinary high water level.
- Pursue management plans for existing controlled outlets on public water basins that did not originally flow to the Pomme de Terre River to address upstream and downstream concerns.
- Pursue management plans for future proposed controlled outlets on public water basins that currently do not flow to the Pomme de Terre River to address upstream and downstream concerns.

Pace of Progress:

While the implementation of runoff volume reduction practices should result in lower flows at the Hoffman and Appleton stream gauges, other factors such as climate change, changes in land use and/or drainage system management may mask the benefits of these projects. Instead, the Planning Partners have decided to measure the pace of progress on a project-by-project basis according to Table 3-3.

Table 3-3. Pace-of-Progress Measures for Altered Hydrology

Type of Project	Measure for Pace-of-Progress	Estimated Acre-ft Storage
Nonstructural Practices (i.e. conservation tillage, residue management, crop rotation, cover crops, and perennial vegetation cover)	Total year-end acreage with nonstructural conservation practices. A process for better understanding and tracking adoption rates will also be explored through Soil-Health related activities under Socioeconomics.	3,527
Wetland Restoration	Track acreage and storage volume provided in acre-feet	

Type of Project	Measure for Pace-of-Progress	Estimated Acre-ft Storage
Structural Practices (e.g. Alternative Tile Intakes, filter strips, contour buffer strips, water and sediment control basins)	Track number of practices implemented, and storage associated in acre-feet if appropriate	0
Management Plans for controlled outlets	Track the number of plans developed	0

3.3 LAKES, WETLANDS, AND SHALLOW BASINS

The major lakes within the northern region of the Pomme de Terre River Watershed include: Pelican Lake, Pomme de Terre Lake, Lake Christina, Barrett Lake, North Turtle Lake, Stalker Lake, and Eagle Lake. These lakes provide fishing and recreation opportunities, with developed shorelines. Some of these lakes are shallow and have been extensively managed to provide fish and waterfowl habitat.

Midway through the watershed there is a significant transition in geology, lake morphology, and land use. Increased runoff in the southern portion of the Pomme de Terre Watershed is one cause of poor lake water quality for Artichoke Lake, Lake Oliver, and Drywood Lake.

3.3.1 Poor Quality Lakes

Issue Statement and Background

Lakes can be impaired for aquatic recreation use due to elevated nutrients that cause unsightly algae blooms and can make swimming undesirable or unsafe, such as excess phosphorus from unstable lake shorelines, extensive land use and drainage alterations in their watersheds, and/or lake sediments. Lakes can also be impaired for aquatic life and not support native and diverse fish and/or aquatic plant communities. There are 217 lakes (DNR-designated and greater than 10 acres) within the watershed, 44 of which have been assessed. *15 lakes are currently, or likely to be, impaired for aquatic recreation in the Pomme de Terre River Watershed.* To date, no lakes have been assessed as impaired for aquatic life.

Priority Area Summary

Lakes impaired for eutrophication that will be addressed first include: Artichoke, Barrett, Perkins, Pomme de Terre, Christina, and North Turtle.

Desired Future Condition (Long-Term Goal):

10-year growing season average in-lake phosphorus concentration, chlorophyll-a concentration, and Secchi depth that meet the water quality standards (Table 3-4). Lake fish and aquatic plant communities that meet aquatic life use standards.

Table 3-4. Observed Water Quality Conditions for Poor Quality Lakes (2017 MPCA Assessment)

Lake	Surface Area (ac)	Observed Water Quality Conditions	
		Total Phosphorus (ug/L)	Secchi Depth (m)
Northern Glaciated Plains Lake Standard		< 90	> 0.7
Artichoke	1,970	225	1.0

Lake	Surface Area (ac)	Observed Water Quality Conditions	
		Total Phosphorus (ug/L)	Secchi Depth (m)
Perkins	516	105	0.7
North Central Hardwood Forests Lake Standard		< 40	> 1.4
Barrett	530	65	1.6
Pomme de Terre	1,816	49	1.0
North Turtle	1,773	84	2.1
Christina	3,971	73	0.6

10-Year Measurable Goals:

Goal 1: *Achieve* lake-specific phosphorus reductions for direct drainage runoff to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes based on current project feasibility (Table 3-5).

Table 3-5. Existing Phosphorus Loads and Load Reduction Goals for Poor Quality Lakes

Poor Quality Lake	PTMApp Existing Watershed Phosphorus Load [lb/yr]	Long-Term Goal: TMDL Reductions Needed to Meet Water Quality Standards [lb/yr]	10-Year Measurable Goal: Reductions Based on Feasibility (lb/yr)
Artichoke	1,713	576	99
Barrett	1,485	561	98
North Turtle	606	126	57
Perkins	1,777	519	275
Pomme de Terre	762	79	142
Christina	437	135	59

Justification for Goals:

Goals are based on what is achievable for County and SWCD staff. Reaching out and finding landowners to voluntarily install BMPs on their land is the biggest challenge and limiting factor for implementation.

Where the goal is exceeded based on the locally determined achievable level of implementation (e.g., Pomme de Terre Lake), those resources will be reallocated to lakes where the 10-year measurable goal is not achieved (e.g., Artichoke and Barrett Lakes). The Planning Partners will re-assess progress towards the lake goals annually and determine if and where resources need to be re-allocated.

Targeted Implementation Activities:

- Lake outreach process. Series of meetings to identify possible in-lake management and engage affected landowners in lake water quality management.
- Conduct an average of 950 hours of Subsurface Sewage Treatment Systems inspections

per year.

- Update 102 septic systems found noncompliant through Subsurface Sewage Treatment Systems inspections.
- Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process.
- Implement 47 shoreline restoration projects for erosion control based on shoreline inventories.
- Implement 113 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within the lakesheds (*practices overlap with BMPs listed in Altered Hydrology*).
- Implement 3,640 acres of nonstructural BMPs based on PTMApp and best professional judgment within the lakesheds (*practices overlap with BMPs listed in Altered Hydrology*).

Pace of Progress:

Table 3-6 summarizes the estimated load reduction expected from implementation of each activity using:

- PTMApp for structural and nonstructural practices.
- Phosphorus reductions from an expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household by County from the 2010 Census, and an average of 1.95 pounds of phosphorus produced per person per year.
- BWSR Water Erosion Pollution Reduction Estimator for shoreline restoration projects. An average reduction of 0.2 pounds of phosphorus per year per 2,500 square feet of shoreline restoration project was used to estimate the expected reductions for the yet identified specific shoreline restoration projects in the watershed.

Table 3-6. Poor Quality Lake Projected Implementation and Estimated Load Reduction

Poor Quality Lake	PTMApp Structural Practices		PTMApp Nonstructural Practices		Septic system improvements		Shoreline restorations	
	Number of Practices [#]	Estimated Load Reduction [lb/yr]	Number of Practices [acres]	Estimated Load Reduction [lb/yr]	Number of Practices [#]	Estimated Load Reduction [lb/yr]	Shoreline Restoration Area [square ft]	Estimated Load Reduction [lb/yr]
Artichoke	7	6.4	650	89.9	2	1.9	5,000	0.4
Barrett	8	7.3	530	73.0	16	16.8	12,500	1.0
North Turtle	16	13.4	250	34.8	5	5.2	40,000	3.3
Perkins	56	52.7	1520	209.6	10	11.6	12,500	1.0
Pomme de Terre	12	13.7	540	74.4	49	50.2	37,500	3.2
Christina	14	17.3	150	20.9	20	20.2	10,000	0.8

**All values are approximate and may change with field verification.*

3.3.2 High Quality Lakes

Issue Statement and Background

Seven lakes that have high biological diversity are close to surpassing the water quality threshold: Clear, Eagle, Elk, Pelican, South Turtle, Spitzer, and Stalker. *While these lakes currently support recreation, they could become degraded in the future if phosphorus loads increase or there are changes to the in-lake plant and fish communities.* Loss of shoreline vegetation and upland natural areas with tree cover reduce the ability of the catchments surrounding these lakes to hold and filter water, adding to the phosphorus problem. Agriculture is the largest land use.

Priority Area Summary

High Quality lakes with water quality conditions near the state water quality thresholds and high biological diversity that will be addressed first include: Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes.

Desired Future Condition (Long-Term Goal):

Maintain or improve water quality (as measured by the growing season average in-lake phosphorus concentration and Secchi depth) compared to observed conditions in the 2017 MPCA Assessment (Table 3-7).

Table 3-7. Observed Water Quality Conditions for High Quality Lakes (2017 MPCA Assessment)

High Quality Lake	Surface Area (ac)	Observed Water Quality Conditions	
		Total Phosphorus (ug/L)	Secchi Depth (m)
Clear	399	37	2.5
Eagle	907	12	5.7
Elk	207	31	2.1
Pelican	3,761	49	0.8
South Turtle	837	18	5.2
Spitzer	731	22	3.0
Stalker	1,357	21	2.9



Lake Christina Overlook

10-Year Measurable Goals:

Goal 1: *Achieve* lake-specific phosphorus reduction in direct drainage runoff to: Clear, Eagle, Elk, South Turtle, Spitzer and Stalker Lakes based on current project feasibility (Table 3-8).

Table 3-8. Existing Phosphorus Loads and Load Reduction Goals for High Quality Lakes

High Quality Lake	PTMApp Existing Watershed Phosphorus Load [lb/yr]	Long-Term Goal: 12% Load Reduction [lb/yr]	10-Yr. Measurable Goal: Reductions Based on Feasibility (lb/yr)
Clear	456	55	126
Eagle	116	14	14
Elk	143	17	4
Pelican	1,257	151	29
South Turtle	281	34	25
Spitzer	80	10	95
Stalker	1,358	163	135

Justification for Goals:

Goals are based on what is achievable for County and SWCD. Identifying landowners willing to install Best Management Practices on their land is challenging and a limiting factor for implementation.

Where the goal is exceeded based on the locally determined level of implementation (e.g., Eagle, Pelican, and Spitzer Lakes), resources will be reallocated to lakes where the goal is not yet achieved (e.g., South Turtle, Clear, Stalker, and Elk). The Planning Partners will re-assess progress towards the lake goals annually and determine if and where resources need to be re-allocated.

Targeted Implementation Activities:

- Conduct an average of 280 hours of Subsurface Sewage Treatment Systems inspections per year.
- Update 130 septic systems found noncompliant through Subsurface Sewage Treatment Systems inspections.
- Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process.
- Implement 82 shoreline restoration projects for erosion control based on shoreline inventories.
- Implement 82 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within the lakesheds (*note that these practices overlap with BMPs identified under Altered Hydrology*).
- Implement 1,150 acres of nonstructural BMPs based on PTMApp and best professional judgment within the lakesheds (*note that these practices overlap with BMPs identified under Altered Hydrology*).

Pace of Progress:

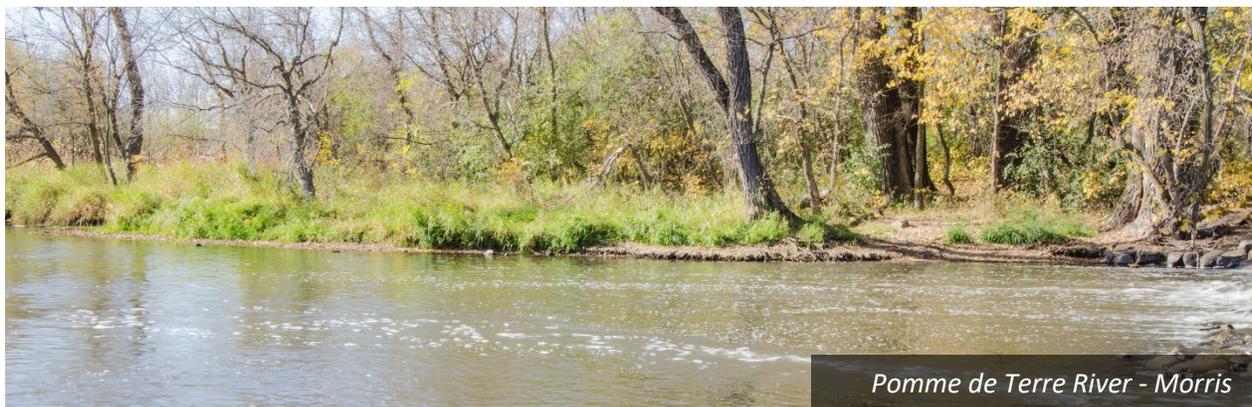
Table 3-9 summarizes the estimated load reduction expected from implementation of each activity using:

- PTMApp for structural and nonstructural practices.
- Phosphorus reductions from an expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household by County from the 2010 Census, and an average of 1.95 pounds of phosphorus produced per person per year.
- BWSR Water Erosion Pollution Reduction Estimator for shoreline restoration projects. An average reduction of 0.2 pounds of phosphorus per year per 2,500 square feet of shoreline restoration project was used to estimate the expected reductions for the yet identified specific shoreline restoration projects in the watershed.

Table 3-9. High Quality Lake Phosphorus Load Reductions by Activity, lb/yr

High Quality Lake	PTMApp Structural Practices		PTMApp Nonstructural Practices		Septic System Improvements		Shoreline Restorations	
	Number of Practices [#]	Estimated Load Reduction [lb/yr]	Number of Practices [acres]	Estimated Load Reduction [lb/yr]	Number of Practices [#]	Estimated Load Reduction [lb/yr]	Shoreline Restoration Area [square ft]	Estimated Load Reduction [lb/yr]
Clear	4	54.7	480	66.3	4	3.9	7,500	0.6
Eagle	1	0.2	70	9.2	4	4.3	7,500	0.6
Elk	1	0.4	0	0	3	3.3	0	0.04
Pelican	1	0.5	0	0	27	27.7	5,000	0.4
South Turtle	4	1.5	80	10.4	10	11.0	20,000	1.6
Spitzer	0	0	30	4.7	75	77.9	150,000	12.2
Stalker	71	58.2	490	67.9	7	7.5	15,000	1.2

**All values are approximate and may change with field verification.*



3.3.3 Protect and Restore Perennial Cover and Shallow Basins

Issue Statement and Background

Shallow lakes, wetlands (basins), and perennial cover in the Pomme de Terre River Watershed are important for storing water. There are many shallow lakes in the Pomme de Terre River watershed, including nationally recognized Lake Christina in Grant and Douglas Counties, which provide critical staging areas for migrating waterfowl in both spring and fall. Shallow basins also support colonial nesting water birds (e.g., shorebirds) and other wildlife, which provide quality bird watching and hunting opportunities.

Shallow basins provide hydrologic benefit in the form of water retention, which in turn reduces peak flows in nearby streams and can help reduce in-stream erosion. *Some shallow lakes and wetlands have been drained to support cultivated cropland.* There is an estimated 44,594 acres of restorable wetlands which equates to approximately 8% of the watershed. Restoration and protection of wetlands and perennial cover will have indirect benefits on downstream water quality through increased water storage and improved water quality in shallow basins before runoff discharges downstream.

Priority Area Summary

Shallow basin protection and restoration and associated perennial cover will be addressed first in the Christina-Pelican Lakes Area.

Desired Future Condition (Long-Term Goal):

Clear water and diverse submerged aquatic plant communities in shallow basins that support migrating and breeding waterfowl and support improved downstream water quality. There is a net increase in shallow basins as a result of creating new or restoring formerly drained shallow basins.

10-Year Measurable Goals:

Goal 1: Protect existing water quality of shallow basins by maintaining wetland and grassland currently enrolled in conservation programs and increasing the amount of perennial vegetation and wetland storage in the watershed.

Justification for Goals:

The Planning Partners estimated the total acres of wetlands and grasslands within the Christina-Pelican Lakes Priority Area. The goal is based on the number of expiring conservation program acres, which are at risk for conversion.

Targeted Implementation Activities:

- Protect/manage a total of 2,700 acres of wetlands and grassland enrolled in various conservation cover programs or enrolled as new acres of perennial vegetation.

Pace of Progress:

Total year-end acreage of perennial vegetation, including currently protected and newly protected acres of perennial vegetation will be tracked over the 10 years.

3.4 RIVER & STREAMS

Beyond the Pomme de Terre River, the watershed has few large streams and creeks, limited to the Pomme de Terre tributaries; Pelican Creek in the Northern Region, and Muddy Creek and Dry Wood Creek in the Southern Region. The remaining streams are small, unnamed resources. Sixteen stream reaches are currently impaired for aquatic recreation and aquatic life uses. Altered hydrology, poor habitat, and high levels of phosphorus and sediment are the principal stressors for the aquatic life impairments. Many of the impaired stream reaches are located in the Southern Region of the watershed which has more highly altered land cover and drainage than the Northern Region. The lower 27 miles of the Pomme de Terre River, from the Swift County Road 20 bridge down to where the river enters the Minnesota River below Appleton, is a state water trail.

3.4.1 Excess pollutants

Issue Statement and Background

Excess levels of phosphorus, sediment, and *E. coli* are impacting the Pomme de Terre River and its tributaries. Sediment inputs to streams come from soil erosion and in-stream channel erosion, often driven by higher stream flows from altered hydrology and changes in land use practices. Phosphorus and *E. coli* inputs to streams come primarily from agricultural runoff, urban runoff, feedlot runoff, and wastewater discharge. Nutrient concentrations and turbidity levels both steadily increase along the mainstem Pomme de Terre River, with the highest concentrations located in the most downstream section. Phosphorus in this system has been observed to be directly contributing to the dissolved oxygen and turbidity impairments also present in this region. *Excess phosphorus and sediment in streams can result in the loss of habitat in addition to direct harm to aquatic organisms.* The priority area for the river corridor encompasses the HUC-12's recognizing that the contributing drainage area is where the work needs to take place to address excess pollutants.

Priority Area Summary

Implementation to reduce pollutants to the Pomme de Terre River will be addressed first in the Drywood Creek Area and Pomme de Terre River Corridor.

Desired Future Condition (Long-Term Goal):

The long-term phosphorus reductions needed from watershed runoff for the benefit of water quality will be based on achieving the 2014 Minnesota Nutrient Reduction Strategy goals of 12% reduction in phosphorus pollution by 2025 from baseline conditions (mid-1990's). The long-term sediment reductions needed will be based on the Pomme de Terre Watershed Total Maximum Daily Load sediment reduction goals of 73% for Drywood Creek and 53% for the Lower Pomme de Terre River. These goals may be modified in the future as other state initiatives are completed.

10-Year Measurable Goals:

Goal 1: Achieve set resource-specific phosphorus reduction goals based on current project feasibility from baseline conditions (mid-1990s) in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (by December 31, 2030).

Goal 2: Achieve set resource-specific sediment reduction goals based on current project feasibility from baseline conditions (mid-1990’s) in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (by December 31, 2030).

Goal 3: Reduce stormwater runoff impacts through BMP implementation in Cities.

Table 3-10. Existing Sediment Loads and Load Reduction Goals for Drywood Creek and the Pomme de Terre River Corridor

	PTMApp Existing Watershed Sediment Load [tons/yr]	Long-Term Goal: TMDL Reductions Needed to Meet Water Quality Standards [tons/yr]	10-Yr. Measurable Goal: Reductions Based on Feasibility [tons/yr]
Drywood Creek Area	24,700	18,032	1,029
Pomme de Terre River Corridor	46,200	24,486	2,501

Table 3-11. Existing Phosphorus Loads and Load Reduction Goals for Drywood Creek and the Pomme de Terre River Corridor

	PTMApp Existing Watershed Phosphorus Load [lb/yr]	Long-Term Goal: TMDL Reductions Needed to Meet Water Quality Standards [lb/yr]	10-Yr. Measurable Goal: Reductions Based on Feasibility [lb/yr]
Drywood Creek Area	2,192	263	209
Pomme de Terre River Corridor	31,850	3,822	382

Justification for Goals:

Goals are based on what is achievable for County and SWCD staff to achieve over the next 10 years. Reaching out and finding landowners to voluntarily install BMPs on their land is the biggest challenge and limiting factor for implementation.

Targeted Implementation Activities:

- One-on-one conversations with 35 landowners per year of top-ranked structural and nonstructural practices (from PTMApp) to enroll in cost-share programs.
- Implement 188 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within Drywood Creek Area and the Pomme de Terre River Corridor Priority Areas (*note that these practices overlap with BMPs identified under Altered Hydrology*).
- Implement 2,580 acres of nonstructural BMPs based on PTMApp and best professional judgment within Drywood Creek Area and the River Corridor Priority Areas (*note that these practices overlap with BMPs identified under Altered Hydrology*).
- Restore 20 acres of drained shallow basins (*note that these practices overlap with BMPs identified under Altered Hydrology*).
- Implement 4 nutrient management plans per year.

- Implement 4 pit closures over 10 years.
- Implement 60 BMPs associated with urban stormwater runoff (i.e. rain gardens).
- Work with cities to develop stormwater management plans in urban areas. Activities include completing steps of stormwater infrastructure inventory, hydrologic analysis, BMP-recommendation development, and development of stormwater erosion and sediment control standards for municipal ordinance and policy inclusion, using MN Stormwater Manual as a guide as part of this assessment.

Pace of Progress:

Table 3-12 summarizes the estimated load reduction expected from implementation of each activity using PTMApp, Board of Water and Soil Resources septic calculator, and average load reductions per foot width of standard buffer.

Table 3-12. Drywood Creek Sediment and Phosphorus Load Reductions by Activity

Drainage Area: Activity	Estimated Load Reductions		
	Number of Practices [#]	Phosphorus (lb/yr)	Sediment (tons/yr)
Drywood Creek HUC 10			
PTMApp Structural Practices	38	44	241
PTMApp Nonstructural Practices	1,180	163	750
Wetland restorations	10	2	38
River Corridor ^a			
PTMApp Structural Practices	150	176	1,006
PTMApp Nonstructural Practices	1,400	194	1,250
Wetland restorations	10	12	245

^a Existing load for the River Corridor was estimated by area weight using the proportion in Lower Pomme de Terre and Middle Pomme de Terre HUC 10 watersheds.

**All values are approximate and may change with field verification.*

3.4.2 Loss of In-Stream Habitat

Issue Statement and Background

Sediment runoff, bank de-vegetation, and erosion have resulted in a loss of riparian habitat and floodplain connections along the Pomme de Terre River Corridor. The 2012 Stressor Identification report identified cattle pasture erosion issues, over widening, excessive fine sediments, channel instability, and floodplain disconnection issues along Drywood Creek and the Pomme de Terre River mainstem, south of Barrett. Cattle on streambanks increase erosion. *Higher runoff and peak stream flows weaken stream banks, increase erosion, and cause a change in the stream shape and increase in fine sediment in the stream.* Floodplains connected to the river can mitigate the impacts of altered hydrology by buffering the impacts of higher flows, reducing downstream erosion, and providing opportunities for groundwater recharge. Vegetated riparian areas trap sediment, nutrients and pesticides, minimizing downstream contributions. Invasive species migration is also an issue in the watershed, and

therefore connectivity improvements may need to be balanced with other aquatic invasive species management needs.

Priority Area Summary

Improving in-stream habitat, riparian habitat, and floodplain connections will be addressed first within the Pomme de Terre River Corridor and Drywood Creek Area.

Desired Future Condition (Long-Term Goal):

Stream channels that maintain physical, chemical and biological functions of a stream, and its associated riparian zone, necessary for meeting the life history requirements of desired aquatic species. In-stream habitat that supports a diverse population of aquatic species. River reaches with run-riffle-pool complexes and vegetated banks. Mature and diverse deep-rooted native vegetation (grasses, shrubs, trees, etc.), stable banks, and connected floodplains along the Pomme de Terre River Corridor.

10-Year Measurable Goals:

Goal 1: Improve in-stream habitat by reducing sedimentation due to stream bank erosion.

Goal 2: Improve riparian habitat by establishing and maintaining perennial buffers and floodplain connections.

Justification for Goals:

In-stream habitat in the Pomme de Terre Watershed has been degraded from excess sedimentation due to stream bank erosion from 1) livestock trampling, agricultural drainage outfalls, and loss of perennial riparian buffers; and 2) high bank shear stress in channel reaches disconnected from the floodplain.

Targeted Implementation Activities:

- Implement 1 BMP per year to reduce erosion due to livestock such as installing crossings and exclusion fencing. Provide alternative water sources.
- Implement 1 pasture management and rotational grazing plan per year.
- Complete 1 Streambank Stabilization Project per year.
- Implement 35 side water inlets where appropriate.
- Implement 120 acres of buffer on "other waters" coming into the main stem of the Pomme de Terre River.

Pace of Progress:

The pace of progress measures for In-Stream Habitat will be based on the number of DNR-identified erosion sites addressed and the acre-feet of voluntary buffers or nonstructural practices implemented beyond the required width.

3.5 ECOSYSTEM HEALTH

Ecosystem health describes the ability of a watershed to support diverse ecosystems, including lakes, streams, prairies, forests, and wetlands. The condition of an ecosystem is based on the quality and connectedness of available habitat, diversity of plant and animal species, and number of rare and unique natural resources. There is a need to maintain, restore and enhance critical habitats to improve water quality, increase infiltration, maintain biodiversity and support wildlife. Given the linear nature of the Pomme de Terre watershed and the interconnectedness of its resources, maintaining or restoring open space and water quality will also have impacts to downstream resources.

3.5.1 Aquatic Invasive Species Management

Issue Statement and Background

Aquatic invasive species threaten the habitat and water quality of lakes and streams in the Pomme de Terre River Watershed. *Existing and possible future aquatic invasive species include starry stonewort, zebra mussels, curlyleaf pondweed, purple loosestrife, and carp.* There is a need to protect lakes and streams at risk for spread of invasive species from other infested water bodies.

Priority Area Summary

Aquatic invasive species threaten the habitat and water quality of all lakes in the Pomme de Terre River Watershed and should be managed watershed-wide.

Desired Future Condition (Long-Term Goal):

Aquatic Invasive Species (AIS) are actively managed to prevent spread and control of existing or future AIS populations in the Planning Area.

10-Year Measurable Goals:

Goal 1: Work towards preventing spread of AIS by improving coordination of County programs across the planning area.

Justification for Goals:

Each of the Counties or SWCDs administer an Aquatic Invasive Species Plan. However, the Planning Partners recognize the need to better coordinate these programs across the Planning Area. There are opportunities to share information on existing and new AIS, and to share resources for regional and statewide training.

Targeted Implementation Activities:

- Annual workshops to coordinate County AIS plans and implementation, or PdTRA holds one meeting per year to discuss AIS.
- Attend DNR District led twice annual County meetings to share ideas with other watersheds.
- Continue implementing education programs identified in County AIS plans (explore partnering on innovative techniques including geo-tagging, radio, billboards).
- Inspection – Work with local law enforcement agencies.

Pace of Progress:

The pace of progress measures for Aquatic Invasive Species Management will be based on:

- Hosting one Planning Area workshop per year.
- Attending a DNR County meeting twice per year.

3.6 SOCIOECONOMIC FACTORS

Human interaction with the environment causes complex, often substantial impacts that affect the entire watershed. Watershed management can address human-environment interactions by reviewing legal systems, promoting best practices, encouraging natural resource-conscious land use decisions and promoting stewardship.

Watershed management efforts are most successful when stakeholders develop robust, coordinated collaborations that empower synergies, leverage efficiencies, work through peer-to-peer relationships, and create multiple approaches to actively manage the watershed's water and natural resources. Many local, regional, and state public and private entities have a vested interest in water resource management and the protection of our water resources and natural environment. Although the source of interest may differ, many of these entities often have overlapping or common goals.

There are numerous stakeholder groups in the Pomme de Terre River Watershed. Engaging these groups in watershed management would promote stewardship and assist in meeting the goals of the Comprehensive Watershed Management Plan. Watershed management programs and projects should provide opportunities to gather and share information, engage stakeholders in the planning and design of restoration and protection activities, promote watershed stewardship, and educate stakeholders on issues critical to protecting and conserving the Pomme de Terre River Watershed.

3.6.1 Watershed Outreach

Issue Statement and Background

In some areas of the Pomme de Terre River Watershed, there is a lack of education and understanding about the connection between land use and the impacts on soil and water resources. *There is also a lack of interest in and acceptance of management practices that help protect and improve water quality and quantity.* For example, some residents do not know about the importance of a healthy shoreline buffer and the required permits for doing certain work to private shoreland. Finally, there is a misconception that the Pomme de Terre River and creeks are a drainage system without community, recreational, or ecosystem value.

Priority Area Summary

Environmental education, water and soil resource awareness, and watershed stewardship should be promoted throughout the entire Pomme de Terre River Watershed. These efforts should target all ages, races, and socio-economic statuses.

Desired Future Condition (Long-Term Goal):

Citizens understand and value the watershed's resources, actively conserve watershed resources, and participate in the implementation of the Pomme de Terre River Comprehensive Watershed Management Plan by being watershed stewards and advocating

for more sustainable land use decision-making. Local governments, including elected officials and staff, have a basic understanding of watershed management and the Pomme de Terre River Comprehensive Watershed Management Plan which facilitates more sustainable land use decisions.

10-Year Measurable Goals:

- Goal 1:** Facilitate strategic networking, learning, and participation of targeted groups to assess, build, and leverage community capacity (i.e. community resources and values) to become aware of water quality issues.
- Goal 2:** Increase adoption of BMPs by increasing engagement and communication with residents, local landowners and agricultural producers to improve water literacy and promote a basic understanding of watershed management.
- Goal 3:** Provide information about how land-use decisions impact the watershed and its resources to locally elected and appointed decision-makers who have a role in addressing the relationship between land use and natural resource protection.
- Goal 4:** Encourage soil and water stewardship and awareness across all generations including future agricultural producers and water recreation enthusiasts to ensure that conservation efforts are maintained into the future.

Justification for Goals:

Goals are based on current levels of involvement from SWCD and County staff, ongoing work that is being completed through a 2018-2021 Public Participation Plan and identified gaps in programs. Watershed outreach goals are geared towards improving community approval and buy-in of voluntary BMPs instillation and water-conservation minded decision making that will help leverage the success of other goals.

Targeted Implementation Activities:

- Establish and facilitate networking/advisory groups for targeted groups (lakeshore, urban, agriculture, etc.). Provide leadership training every other year.
- Establish soil health teams for Northern and Southern Regions. Two meetings per group per year.
- Regional tours (every 2 years) on prioritized portions of the watershed to facilitate partnerships, highlight improvements, and discuss upcoming priorities for the area.
- 2 BMP-focused (i.e. raingardens, lakeshore restoration, native plantings, land retirement programs, etc.) demonstrations/workshops in the watershed each year.
- Soil health field days.
- Continue the work being initiated by the WRAPS Cycle II by identifying a target audience for BMP adoption through follow-up interview on changes made over time.
- Conduct a 5-year watershed tour to re-evaluate progress, reconnect with partners, and create new partnerships.
- Host conversation/meeting on the state of local water quality and importance of watershed management to all types of local officials and state/federal officials.
- Create and host consistent orientation to all types of newly elected local officials on the Pomme de Terre watershed and include previously elected (current) local officials to reinforce the message (cities, SWCDs, counties, townships, etc.).

- Coordinate with UMN Extension to host Aqua Chautauqua within watershed.
- Conduct annual kayak tour on the Pomme de Terre River to raise awareness of the resource and provide education about streamside ecology.
- Continue K-12 curriculum about watershed management.
- Create a StoryMap to highlight 1W1P plan priority issues, areas, and existing conservation practices/programs in the watershed and post on the PdTRA website.
- Create a list serve to share information about the watershed on a more routine basis.

Pace of Progress:

Pace of progress measures for Education & Outreach will be based on the:

- Number of networking groups create & maintained.
- Establishment of soil health team and demonstration plots.
- Number of tour participants and pre-/post-event surveys.
- Number of locals reached through outreach materials, meetings, and workshops.
- Number of BMP cost-share sign-ups as a result of demonstrations/workshops.
- Number of locally elected and state/federal officials attending meetings.

3.6.2 Lakeshore Owner Education

Issue Statement and Background

The number of impervious surfaces in the drainage area to Recreational Development and General Development Classified lakes is increasing, bigger homes are being built with bigger septic systems, and other development activities are decreasing the amount of high quality habitat found along the lakeshore. For lakes with existing development, there are issues related to redevelopment activity as seasonal cabins are converted to larger homes. For the smaller, undeveloped lakes (e.g. natural environment lakes) there are issues with the development of new cabins and homes. *Increased development contributes to shoreline erosion, increases in the amount of nutrients and sediments getting into lakes, and increased run-off through loss of deep rooted vegetation (native grasses, shrubs, trees, etc.).* In addition, development in shallow lake bays may need to be addressed differently than the rest of the lake.

An additional pressure on the larger, developed lakes (e.g., Stalker) is the second ring of development which occurs beyond the first ring (lakeshore) development. As more people look to increase density around already developed lakes, there are impacts to adjacent wetlands or waters. The filling of wetlands to gain access or to locate auxiliary buildings has implications to the quality of the downstream resource.

Priority Area Summary

Shoreline development and degradation is an issue for lakes throughout the Northern Region which are almost fully developed and will be addressed first in lakes in the Northern Lakes Area, Pelican-Christina Lakes Area, and the Pomme de Terre River Lakes Chain Area.

Desired Future Condition (Long-Term Goal):

Shoreline redevelopment and second tier development that is managed to protect the stability of the lake shoreline and minimize nutrient and sediment runoff to lakes.

10-Year Measurable Goals:

Goal 1: Increase shoreland owner understanding of why there are shoreland regulations, why there are limitations to impervious surface coverage, why vegetation and land alterations impact lake water quality, habitat and lake aesthetics, and how to be better stewards of the watershed's lakes shoreline.

Targeted Implementation Activities:

- Provide annual lakeshore management education and outreach to the lakeshore owners at 6 lake association/sportsmen's group/Otter Tail Coalition of Lake Associations meetings per year.
- Educational materials distributed to existing lakeshore owners via brochure with link in tax mailing.
- Educational materials distributed to new lakeshore owners at property transfer – develop brochure for new owners, develop an approach to determine how best to distribute material.

Pace of Progress:

Pace of progress measures for lakeshore owner education will be based on the:

- Number of locals reached annually through outreach materials.
- Number of education and outreach lake association/sportsmen meetings.



Aerial Photography of the Pomme de Terre Watershed

4 TARGETED IMPLEMENTATION SCHEDULE

This section describes the Targeted Implementation Schedule which identifies when and where specific actions will be implemented within the Pomme de Terre River watershed to achieve the desired goals for the 10-year timeframe of the Plan. The Targeted Implementation Schedule includes both structural (capital improvement) and programmatic elements recognizing that effective watershed management needs to address the root causes and drivers of environmental impacts, not just the symptoms, in order to achieve long-term (sustainable) solutions.

The inclusion of an action in the Targeted Implementation Schedule is a statement of intent by the Planning Partners. Implementation rests on further PdTRA JPB decisions to budget for and fund the action which will be made in response to routine evaluation of performance in achieving the goals of this Plan. Similarly, over the period of 10 years, as priorities evolve and new concerns emerge or new approaches are developed, the Planning Partners may choose to undertake an action not included in the Targeted Implementation Schedule. The listing of actions in the Targeted Implementation Schedule is not intended to exclude other actions that are consistent with the issues, goals and policies identified in Section 3.0. In such cases, undertaking an action not explicitly identified in the Targeted Implementation Schedule may require amending the Plan as described in Section 6.0 Plan Administration and Coordination.

4.1 TARGETED IMPLEMENTATION PLAN STRUCTURE

The Targeted Implementation Schedule of the Pomme de Terre River Comprehensive Watershed Management Plan is presented in Table 4-2 through Table 4-7 that includes the following items:

- Implementation activities for the priority issues and concerns (actions).
- Link to the corresponding priority concern(s) and goal(s).
- Location targeting where action will occur.
- Estimated cost.
- Estimated time when implementation of the activity will occur within the 10-year timeframe of the Plan.
- Project lead and project partners.
- Description of how outcomes of the action will be measured.

Table 4-1. Pomme de Terre River Comprehensive Watershed Management Plan Budget Summary Table (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

Pomme de Terre River Issues & Goals Category	Schedule for the Next 10 Years (2021-2030)										
	2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Cost \$
ALTERED HYDROLOGY	5,034,956	5,220,801	5,105,485	5,370,668	5,412,104	5,600,926	5,716,190	5,970,947	6,024,160	6,214,309	55,670,542
GROUNDWATER	115,015	94,353	121,903	91,353	118,903	47,790	75,340	52,170	81,340	55,250	853,417
LAKES, WETLANDS AND SHALLOW BASINS	496,391	516,884	623,567	651,748	622,667	643,537	651,607	727,738	622,667	657,448	6,214,254
RIVERS AND STREAMS	120,151	113,716	108,501	103,941	103,176	109,791	107,826	103,266	112,501	113,221	1,096,090
ECOSYSTEM HEALTH	84,372	3,444	4,569	3,444	3,669	3,444	4,569	3,444	4,569	3,444	118,968
SOCIOECONOMIC FACTORS	93,760	79,760	84,960	85,823	96,248	88,560	84,960	79,760	53,395	58,420	805,645
TOTAL	5,938,945	6,023,258	6,053,285	6,311,277	6,361,067	6,498,348	6,644,792	6,941,625	6,892,932	7,096,392	64,761,923



Table 4-2. Groundwater Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA		
3.1.1-A	Protect public drinking water supplies with moderate and high vulnerability with best management practice technical assistance in Appleton, Morris, and Barrett.	Conversion of 500 acres of cropland to perennial vegetation through perpetual easements and 10 to 15 year contracts by 2030	DWSMA's within Pomme de Terre River Lakes Chain, River Corridor	41,788	57,801	85,351	57,801	85,351	14,238	41,788	14,238	41,788	14,238	454,382	Federal, State	SWCDs			S		S	S		BWSR, MDH, NRCS, FSA	# of acres enrolled
3.1.1-B		SWCD Staff will review wellhead protection plans and maintain/improve coordination with Cities on partnering opportunities. Staff will also serve on wellhead protection planning teams.	DWSMA's within Pomme de Terre River Lakes Chain, River Corridor	2,912	2,237	2,237	2,237	2,237	2,237	2,237	2,237	2,237	2,237	23,045	State	SWCDs			S		S	S		Cities, MDH, MN Rural Waters	Wellhead meetings attended
3.1.1-C		Contact landowners about completing BMP projects within DWSMA areas.	DWSMA's within Pomme de Terre River Lakes Chain, River Corridor	1,635	1,635	1,635	1,635	1,635	1,635	1,635	1,635	1,635	1,635	16,350	State	SWCDs			S	S	S	S		Cities, MDH	Number of landowners contacted
3.1.1-D		Provide resources to private well owners about water testing programs and available treatment options for nitrate and arsenic.	Host annual well water nitrate and arsenic testing clinics and coordinate with environmental labs to have nitrate and arsenic testing kits available to the public	Watershed Wide	8,110	8,110	8,110	8,110	8,110	8,110	8,110	8,110	8,110	8,110	81,100	State, Local	SWCDs	S	S	S	S	S	S		BWSR, MDH, Schools, County Fairs

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability	
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA			
3.1.1-E	Reduce the number of conduits to the groundwater system (e.g. abandoned wells) to protect groundwater quality by sealing abandoned wells.	Provide cost-share assistance to 134 well owners for sealing of unsealed, unused wells. Prioritize abandoned wells for sealing within moderate and high pollution sensitivity areas and Drinking Water Supply Management Areas	Pomme de Terre River Corridor Watershed Wide	9,480	9,480	9,480	10,080	10,080	10,080	10,080	10,080	10,080	10,080	10,080	99,000	State	SWCDs					S	C		Cities, BWSR, MDH	Number of abandoned wells sealed
3.1.2-A	Assist agricultural producers with groundwater conservation by promoting water conservation measures that improve water use efficiencies and reduce water demand.	Promote and encourage the adoption of irrigation water management BMPs that increase water conservation and decrease conditions for nitrogen loss	Pomme de Terre River Corridor	3,840	3,840	3,840	3,840	3,840	3,840	3,840	3,840	3,840	3,840	38,400	State	SWCDs					S	S		MDH, USDA, DNR, MDA	Number of fields with irrigation scheduling plans or flow regulation.	
3.1.2-B		Counties will request of the County Geologic Atlas, including staff time to locate wells to support atlas development.	Watershed Wide	41,400	5,400	5,400	1,800	1,800	1,800	1,800	1,800	1,800	1,800	64,800	State, Local	Counties	C S	C S	C S	C S	C S	C S	X	MGS, SWCDs	Number of Counties with the development of Geologic Atlas in progress.	
3.1.2-C		Identify and focus BMPs/conservation on recharge/vulnerable areas identified from the hydrogeologic section of the County Geologic Atlas (Section B)	Watershed Wide	-	-	-	-	-	-	-	4,380	6,000	7,460	17,840	State, Local	Counties		C S	C S					MGS, SWCDs	Recharge and vulnerable areas identified	
3.1.2-D		Continue ongoing observation well monitoring efforts	Watershed Wide	5,850	5,850	5,850	5,850	5,850	5,850	5,850	5,850	5,850	5,850	58,500	State	SWCDs	S			S	S	S		Cities, Counties, MDH, DNR	Annual observation well monitoring	

Table 4-3. Altered Hydrology Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA		
3.2.1-A	Reduce annual runoff by 0.08 in. (or 3,527 acre ft.) at the outlet of the Pomme de Terre River Watershed.	Implement 20,840 acres of perennial vegetation including the use of state and federal conservation programs, inclusive of 500 acres that are specific to the Drinking Water Protection priority areas.	Watershed Wide	1,686,700	1,566,497	1,509,572	1,420,698	1,351,430	1,414,518	1,373,846	1,394,182	1,379,296	1,344,074	14,440,813	Federal, State	SWCDs	C S	S	S	S	S	S		NRCS, FSA, BWSR	Total year-end acres with perennial cover. Tracked annually
3.2.1-B		Complete 2,920 acres of wetland restoration inclusive of 2,720 acres that will be targeted within priority areas.	Watershed Wide	1,754,120	1,984,565	2,082,942	2,247,353	2,477,799	2,576,176	2,740,587	2,971,033	3,069,409	3,233,821	25,137,805	Federal, State	SWCDs	C S	S	S	S	S	S		NRCS, FSA, BWSR	Total year-end acres with perennial cover. Tracked annually and storage volume provided in acre-feet

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PDTRA		
3.2.1-C	Continued from above: Reduce annual runoff by 0.08 in. (or 3,527 acre ft.) at the outlet of the Pomme de Terre River Watershed.	Implement 581 structural agricultural best management practices based on PTMAApp and best professional judgment inclusive of 383 practices that will be targeted within priority areas.	Watershed Wide	449,677	546,318	449,677	569,699	449,677	546,318	473,059	546,318	449,677	546,318	5,026,737	State	SWCDs	C	S	S	S	S	S		NRCS, FSA, BWSR, DNR, USFWS	Number of BMPs implemented and acre-feet of storage associated
3.2.1-D		Implement 9,340 acres of nonstructural agricultural best management practices based on PTMAApp and best professional judgment inclusive of 7,370 acres that will be targeted within priority areas.	Watershed Wide	1,041,699	1,075,301	1,041,699	1,108,903	1,108,903	1,041,699	1,108,903	1,041,699	1,108,903	1,075,301	10,753,007	Federal, State	SWCDs	C	S	S	S	S	S		NRCS, FSA, BWSR, MDA, UofM, Soil Health Team	Total year-end acres with soil-health practices under single and multi-year contracts. Tracked annually. A process for better understanding and tracking adoption rates will also be explored.
3.2.1-E		Identify previously completed BMPs and create spatial database, develop database for tracking projects in the future.	Watershed Wide	91,000	38,440	13,775	13,775	13,775	13,775	13,775	13,775	13,775	13,775	239,640	State	PDTRA	C	S	S	S	S	S	X	SWCDs, Counties, DNR, USFWS	Database for tracking projects (include practices from DNR and USFW).
3.2.1-F	No increase in runoff in non-contributing areas during peak run-off periods.	Identify public water basins that do not flow to the Pomme de Terre River and may exceed the ordinary high water level.	Watershed Wide	2,300	1,800	2,300	1,800	500	-	500	-	500	-	9,700	State	BWSR								SWCDs, Counties	GIS layer
3.2.1-G		Pursue management plans for existing controlled outlets on public water basins that did not originally flow to the Pomme de Terre River to address upstream and downstream concerns.	Watershed Wide	4,730	3,940	2,760	4,220	5,010	4,220	2,760	1,970	1,300	510	31,420	Local	Counties		S	S	S	S	S		Environmental Lab, DNR	# water management plans based on identified basins
3.2.1-H		Pursue management plans for future proposed controlled outlets on public water basins that currently do not flow to the Pomme de Terre River to address upstream and downstream concerns.	Watershed Wide	4,730	3,940	2,760	4,220	5,010	4,220	2,760	1,970	1,300	510	31,420	Local	Counties		C	C	C	C	C		SWCDs, Environmental Lab, DNR	# water management plans based on identified basins

Table 4-4. Lakes, Wetlands, and Shallow Basins Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability	
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA			
3.3.1-A	Achieve lake-specific phosphorus reductions for direct drainage runoff to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes based on current project feasibility (Table 3-5).	Lake outreach process. Series of meetings to identify in-lake management and engage affected landowners in lake water quality management.	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	20,070	12,870	2,870	1,970	1,970	7,670	1,970	1,970	1,970	1,970	7,670	61,000	State, Local	SWCDs, Counties	C	C	C	C	C			Lake Associations	A series of outreach meetings for 3 lakes.
3.3.1-B		Conduct 950 hours of Subsurface Sewage Treatment Systems inspections	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	58,000	State, Local	Counties	C	C	C	C	C			Lake Associations	A series of outreach meetings for 3 lakes.
3.3.1-C		Update 102 Septic Systems found noncompliant through SSTS inspections	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	1,020,000	Local	Counties	C	C	C	C	C			Townships, MPCA	Number of updated Septic Systems and calculated Phosphorus Reductions
3.3.1-D		Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	-	45,220	-	-	-	-	45,220	-	-	-	-	90,440	State	SWCDs, Counties	C	C	C	C	C			DNR	Resulting feet of shoreline identified as requiring additional conservational activities.
3.3.1-E		Implement 47 shoreline restoration projects for erosion control based on shoreline inventories	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	43,971	9,804	56,442	85,523	56,442	71,612	70,352	84,623	56,442	85,523	620,734	State	SWCDs	S	S	S	S	S			Lake Associations, Counties	Calculated Phosphorus Reductions	
3.3.1-F		Implement 113 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within the lakesheds (note that these practices overlap with BMPs identified under Altered Hydrology).	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	State	SWCDs	S	S	S	S	S			Lake Associations, Counties, NRCS, FSA	Calculated Phosphorus Reductions
3.3.1-G		Implement 3,640 acres of nonstructural BMPs based on PTMApp and best professional judgment within the lakesheds (note that these practices overlap with BMPs identified under Altered Hydrology).	Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain, Drywood Creek Area	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	Federal, State	SWCDs	S	S	S	S	S			Lake Associations, NRCS, FSA, Soil Health Team	Calculated Phosphorus Reductions
3.3.2-A	Achieve lake-specific phosphorus reduction in direct drainage runoff to: Clear, Eagle, Elk, South Turtle, Spitzer and Stalker Lakes based on current project feasibility (Table 3-8).	Conduct 280 hours of Subsurface Sewage Treatment Systems inspections	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	1,164	1,164	1,164	1,164	1,164	1,164	1,164	1,164	1,164	1,164	16,400	Local	Counties			C	C				Townships, MPCA	SSTS landowners identified and informed	
3.3.2-B		Update 130 Septic Systems found noncompliant through SSTS inspections	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	1,300,000	Local	Counties			C	C				Townships, MPCA	Number of updated Septic Systems and calculated Phosphorus Reductions	
3.3.2-C		Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	-	16,640	-	-	-	-	16,640	-	-	-	33,280	State	SWCDs, Counties			C	C				DNR	Resulting feet of shoreline identified as requiring additional conservational activities.	

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead						Project Partners	Activity Outcome Measurability		
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift			PdTRA	
3.3.2-D	Continued from above: Achieve lake-specific phosphorus reduction in direct drainage runoff to: Clear, Eagle, Elk, South Turtle, Spitzer and Stalker Lakes based on current project feasibility (Table 3-8).	Implement 82 structural BMPs for erosion control based on shoreline inventories.	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	-	-	131,905	131,905	131,905	131,905	146,935	146,935	131,905	131,905	1,085,298	State	SWCDs			S	S				Lake Associations	Calculated Phosphorus Reductions	
3.3.2-E		Implement 82 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within the lakesheds (note that these practices overlap with BMPs identified under Altered Hydrology).	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	State	SWCDs			S	S				Lake Associations	Calculated Phosphorus Reductions
3.3.2-F		Implement 1,150 acres of nonstructural BMPs based on PTMApp and best professional judgment within the lakesheds (note that these practices overlap with BMPs identified under Altered Hydrology)	Northern Lakes Area, Christina-Pelican Lakes Area, Pomme de Terre River Lakes Chain	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	Federal, State	SWCDs			S	S				Lake Associations	Calculated Phosphorus Reductions
3.3.3-A	Protect existing water quality of shallow basins by maintaining wetland and grassland currently enrolled in conservation programs and increasing the amount of perennial vegetation in the watershed.	Protect/manage a total of 2,700 acres of wetlands and grassland enrolled in various conservation cover programs or enrolled as new acres of perennial vegetation.	Christina-Pelican Lakes Area	193,386	193,386	193,386	193,386	193,386	193,386	193,386	193,386	193,386	193,386	1,933,863	State, Federal	SWCDs			S	S				Townships, MPCA, DNR, USFW, NRCS, FSA	Acres of expiring land contacted: re-enrolled/enrolled expiring acres over the 10 year period, or treated through another management tool	

Table 4-5. River and Streams Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead						Project Partners	Activity Outcome Measurability	
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift			PdTRA
3.4.1-A	Achieve set resource-specific phosphorus and sediment reduction goals based on current project feasibility from baseline conditions (mid-1990s) in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (by December 31, 2030).	One-on-one conversations with 35 landowners per year of PTMApp top-ranked and best professional judgment of structural and nonstructural practices to enroll in cost-share programs.	Drywood Creek Area, River Corridor	6,315	6,090	6,315	6,315	6,090	5,415	5,640	5,640	5,415	5,595	58,830	State	SWCDs	S				S	S		BWSR, NRCS	Number of Landowners Reached
3.4.1-B		Implement 188 structural agricultural best management practices (BMPs) based on PTMApp and best professional judgment within Drywood Creek Area and the Pomme de Terre River Corridor Priority Areas (note that these practices overlap with BMPs identified under Altered Hydrology)	Drywood Creek Area, River Corridor	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	State	SWCDs	S				S	S		BWSR, NRCS

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability		
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	P&TRA				
3.4.1-C	<i>Continued from above:</i> Achieve set resource-specific phosphorus and sediment reduction goals based on current project feasibility from baseline conditions (mid-1990s) in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (by December 31, 2030).	Implement 2,580 acres of nonstructural BMPs based on PTMAp and best professional judgment within Drywood Creek Area and the River Corridor Priority Areas. (note that these practices overlap with BMPs identified under Altered Hydrology)	Drywood Creek Area, River Corridor	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	Federal, State	SWCDs	S					S	S		BWSR, NRCS	Phosphorus and Sediment reductions
3.4.1-D		Restore 20 acres of drained shallow basins (note that these practices overlap with BMPs identified under Altered Hydrology)	Drywood Creek Area, River Corridor	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	See AH	Federal, State	SWCDs	S					S	S		BWSR, NRCS	Phosphorus and Sediment reductions
3.4.1-E		Implement 4 nutrient management plans per year	Drywood Creek Area, River Corridor	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	80,000	Federal, State	SWCDs	S					S	S		BWSR, NRCS	Phosphorus and Sediment reductions
3.4.1-F		Implement 4 agriculture pit closures over 10 years	Drywood Creek Area, River Corridor	10000	10000									10000	10000	40000	Federal, State	SWCDs	S					S	S		BWSR, NRCS
3.4.1-G	Reduce stormwater runoff impacts through BMP implementation in Cities.	Implement 60 BMPs associated with urban stormwater runoff (i.e. rain gardens)	Cities	47,993	47,993	47,993	47,993	47,993	47,993	47,993	47,993	47,993	47,993	479,932	State	SWCDs							S	S		BWSR, NRCS	Phosphorus and Sediment reductions
3.4.1-H		Work with cities to develop stormwater management plans in urban areas. Activities include completing steps of stormwater infrastructure inventory, hydrologic analysis, BMP-recommendation development, and development of stormwater erosion and sediment control standards for municipal ordinance and policy inclusion, using MN Stormwater Manual as a guide as part of this assessment.	Cities	6,750	-	5,100	-	-	6,750	5,100	-	-	-	23,700	State, Local	Cities, MPCA							S	S		SWCDs	Number of plans developed
3.4.2-A	Improve in-stream habitat by reducing sedimentation due to stream bank erosion.	Implement 1 BMP per year to reduce erosion due to livestock such as installing crossings and exclusion fencing. Provide alternative water sources.	Drywood Creek Area, River Corridor	8,910	9,990	8,910	9,990	8,910	9,990	8,910	9,990	8,910	9,990	94,500	Federal, State	SWCDs							S	S		NRCS, DNR	# implemented and sediment and phosphorus reductions
3.4.2-B		Implement 1 pasture management and rotational grazing plan per year.	Drywood Creek Area, River Corridor	1,410	2,490	1,410	2,490	1,410	2,490	1,410	2,490	1,410	2,490	19,500	Federal, State	SWCDs							S	S		NRCS, DNR	# implemented and sediment and phosphorus reductions
3.4.2-C		Complete 1 Streambank Stabilization Project per year	Drywood Creek Lakes Area, River Corridor	13,520	14,600	13,520	14,600	13,520	14,600	13,520	14,600	13,520	14,600	140,605	State	SWCDs							S	S		NRCS, DNR	# implemented and sediment and phosphorus reductions
3.4.2-D		Implement 35 side water inlets where appropriate.	Drywood Creek Lakes Area, River Corridor	12,348	9,648	12,348	9,648	12,348	9,648	12,348	9,648	12,348	9,648	109,980	State	SWCDs							S	S		NRCS, DNR	# implemented and sediment and phosphorus reductions
3.4.2-E	Improve riparian habitat by establishing and maintaining perennial buffers and floodplain connections.	Implement 120 acres of buffer on "other waters" coming into the main stem of the Pomme de Terre River.	River Corridor	4,905	4,905	4,905	4,905	4,905	4,905	4,905	4,905	4,905	49,050	Federal, State	SWCDs	S						S	S		DNR, BWSR, FSA, NRCS	Total year-end acres with perennial cover (include acres from DNR and USEWS), tracked annually	

Table 4-6. Ecosystem Health Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA		
3.5.1-A	Work towards preventing spread of AIS by improving coordination of County programs across the planning area.	Annual workshops to coordinate County AIS plans and implementation, or PdTRA holds one meeting per year to discuss AIS	Watershed Wide	3,129	2,004	3,129	2,004	3,129	2,004	3,129	2,004	3,129	2,004	25,665	State	PdTRA	C	C	C	C	C	C	C	DNR, AIS detectors, MAISR (U of M), Lake associations	One Planning Area workshop per year
3.5.1-B		Attend DNR District led twice annual County meetings to share ideas with other watersheds	Watershed Wide	3,712	540	540	540	540	540	540	540	540	540	8,572	State	County	C	C	C	C	C	C	DNR, AIS detectors, MAISR (U of M), Lake associations	DNR County meeting twice per year; # of collaborative meetings	
3.5.1-C		Continue implementing education programs identified in County AIS plans (explore partnering on innovative techniques including geo-tagging, radio, billboards)	Watershed Wide	10,494	-	-	-	-	-	-	-	-	-	10,494	State	County, SWCD	C	C	C	C	C	C	DNR, AIS detectors, MAISR (U of M), Lake associations	Group to define what AIS they are focusing on - TBD at annual of bi-annual meetings.	
3.5.1-D		Inspection – Work with local law enforcement agencies.	Watershed Wide	67,037	900	900	900	900	900	900	900	900	900	74,237	State, Local	County	C	C		C		C	DNR, AIS detectors, MAISR (U of M), Lake associations	# inspections	

Table 4-7. Socioeconomic Factors Issues & Goals Targeted Implementation Schedule (2021-2030)

[Note: The final budget tables are based on 2019 estimates and not adjusted for inflation.]

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability	
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA			
3.6.1-A	Facilitate strategic networking, learning, and participation of targeted groups to assess, build, and leverage community capacity to become aware of water quality issues.	Establish and facilitate Networking/Advisory Groups for targeted groups (lakeshore, urban, agriculture, etc.). Provide leadership training every other year.	Watershed Wide	2,180	1,980	2,180	1,980	2,180	1,980	2,180	1,980	2,180	1,980	20,800	State	SWCDs	C	S	S	S	S	S	X	UM Extension	# of networking groups created & maintained (i.e. new lake associations or other ag/urban advisory groups)	
3.6.1-B		Establish soil health teams for Northern and Southern Regions. 2 meetings/group/year	Watershed Wide	11,730	11,730	11,730	11,730	11,730	11,730	11,730	11,730	11,730	11,730	117,300	State, Local	SWCDs	C	S	S	S	S	S	X		Establishment of soil health team and demonstration plots	
3.6.1-C		Regional tours (every 2 years) on prioritized portions of the watershed to facilitate partnerships, highlight improvements, and discuss upcoming priorities for the area.	Watershed Wide	5,000	--	5,000	--	--	--	5,000	--	5,000	--	20,000	Local	PdTRA	C	C	C	C	C	C	X	LGUs	# of tour participants, gauge tour learning gains through pre-event and follow-up surveys	
3.6.1-D		Increase adoption of BMPs by increasing engagement and communication with residents, local landowners and agricultural producers to improve water literacy and promote a basic understanding of watershed management.	2 BMP-focused (i.e. raingardens, lakeshore restoration, native plantings, land retirement programs, etc.) demonstrations/workshops in the watershed each year	Watershed wide	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	State	SWCDs	C	S	C	S	S	S	X		# of locals reached annually and number of BMP cost-share sign-ups as a result of demonstrations/workshops
3.6.1-E		Soil health field days	Soil health field days	Watershed Wide	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	State, Local	SWCDs	S	S	S	S	S	S	X		# of attendees, number of sign-ups for continuous education and potential plot demonstration	

ID #	Measurable Goals	Implementation Activity	Priority Area	Schedule for the Next 10 Years (2021-2030)											Major Funding Entity(ies)	Project Lead	Local Project Lead							Project Partners	Activity Outcome Measurability	
				2021 \$	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$	2027 \$	2028 \$	2029 \$	2030 \$	10-Year Project Cost			Big Stone	Douglas	Grant	Otter Tail	Stevens	Swift	PdTRA			
3.6.1-F	<i>Continued from above:</i> Increase adoption of BMPs by increasing engagement and communication with residents, local landowners and agricultural producers to improve water literacy and promote a basic understanding of watershed management.	Continue the work being initiated by the WRAPS Cycle II by identifying a target audience for BMP adoption through follow-up interview on changes made over time.	Watershed Wide	--	--	--	6,063	6,063	--	--	--	--	--	12,125	State	PDTRA	S	S	S	S	S	S	X		Compile information on behavior and acceptance changes, and educational gains over a longer period of time	
3.6.1-G	Provide information about how land-use decisions impact the watershed and its resources to locally elected and appointed decision-makers who have a role in addressing the relationship between land use and natural resource protection.	Conduct a 5-year watershed tour to re-evaluate progress, reconnect with partners, and create new partnerships	Watershed Wide	--	--	--	--	10,225	--	--	--	--	10,225	20,450	Local	PDTRA	C	C	C	C	C	C	X		# of tour participants, gauge tour learning gains through pre-event and follow-up surveys	
3.6.1-H		Host conversation/meeting on the state of local water quality and importance of watershed management to all types of local officials and state/federal officials.	Watershed wide	970	970	970	970	970	970	970	970	970	970	9,700	State, Local	PDTRA	C	C	C	C	C	C	X		# of locally elected and state/federal officials attending meetings. Gauge educational gains through before, during, and follow-up surveys.	
3.6.1-I		Create and host consistent orientation to all types of newly elected local officials on the Pomme de Terre watershed and include previously elected (current) local officials to reinforce the message (city, SWCDs, counties, townships, etc.)	Watershed wide	4,340	4,340	4,340	4,340	4,340	4,340	4,340	4,340	4,340	4,340	43,400	Local	PDTRA	C	C	C	C	C	C	X	UMN Extension	Number of locally elected and state/federal officials attending meetings. Gauge educational gains through before, during, and follow-up surveys.	
3.6.1-J		Coordinate with UMN Extension to Host Aqua Chautauqua within watershed	Watershed wide	8,800	--	--	--	--	8,800	--	--	--	--	17,600	State	PDTRA							X	UMN Extension	Number of attendees	
3.6.1-K		Conduct annual Kayak Tour on the Pomme de Terre River to raise awareness of the resource and provide education about streamside ecology	Watershed wide	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	970	970	15,940	Local	PDTRA							X	UMN Extension	Number of participants
3.6.1-L	Encourage soil and water stewardship and awareness across all generations, including future agricultural producers and water recreation enthusiasts, to ensure that conservation efforts are maintained into the future.	Continue K-12 curriculum about watershed management	Watershed wide	22,325	22,325	22,325	22,325	22,325	22,325	22,325	22,325	22,325	4,340	4,340	187,280	State, Local	SWCDs, PDTRA		S	S	S	S	S	X	Schools	Number of students reached through educational programs
3.6.1-M	Create a StoryMap to highlight 1W1P plan priority issues, areas, and existing conservation practices/programs in the watershed and post on the PdTRA website		Watershed wide	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	-	-	43,200	State	PDTRA							X		Creation of story map that helps landowners find information.
3.6.1-N		Create a listserv (e.g. vertical response) to share information about the watershed on a more routine basis	Watershed wide	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	--	--	59,200	State	PDTRA								X	
3.6.2-A	Increase lakeshore owner understanding of why there are lakeshore regulations, why there are limitations to impervious surface coverage, how vegetation and land alterations impact lake water quality, habitat and lake aesthetics, and how to be better stewards of the watershed's lake shoreline.	Provide annual lakeshore management education and outreach to the lakeshore owners at 6 lake association/sportsmen's / Otter Tail COLA meetings per year.	Pomme de Terre River Lakes Chain, Christina-Pelican Lakes Area, Northern Lakes Area	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	49,530	State, Local	Counties, SWCDs		C	C	C	C			X	Lake Associations	Number of meetings
3.6.2-B		Educational materials distributed to existing lakeshore owners via brochure with link in tax mailing.	Pomme de Terre River Lakes Chain, Christina-Pelican Lakes Area, Northern Lakes Area	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	21,600	State, Local	Counties, SWCDs, PDTRA		C	C	C	C			X	Lake Associations	Number of landowners that materials are provided to.
3.6.2-C		Educational materials distributed to new lakeshore owners at property transfer – develop brochure for new owners, develop an approach to determine how best to distribute material.	Pomme de Terre River Lakes Chain, Christina-Pelican Lakes Area, Northern Lakes Area	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	17,520	State, Local	Counties			C	C						Realtors

4.2 PRIORITIZATION OF PROGRAMS AND PROJECTS

As the Planning Partners evaluated the implementation activities identified during the plan development process, the following criteria were applied in determining which of the activities should be eliminated, implemented first or implemented later in the 10-year timeframe of the Plan:

Existing/Ongoing Activity

- *Is the implementation activity something that is currently being performed uniformly by the counties/SWCDs in the Planning Area? If not, is it a local priority or a Plan priority?*

Suitable Entity

- *Is the PDTRA the most appropriate entity to implement the activity in question or is another entity more appropriate (e.g. state agency)?*

Priority Areas

- *Does the action address the issue(s) and goal(s) of the priority resources and areas described in Section 2.0 Analysis and Prioritization of Issues and Resource Concerns?*

Watershed

- *Does the action address issue(s) and goal(s) that were determined to be a priority for the entire watershed and are necessary for successful, future implementation at a local scale (e.g., Education and Outreach, well sealing, Long-Term Flood Evaluation Study)?*

Address a Gap in the Knowledge Base

- *Does the implementation activity enhance the Planning Partners' understanding of the resource protection and/or restoration needs thereby allowing the PDTRA to make more effective management decisions?*

Recommendation from the Civic Engagement Process

- *Were the projects/implementation activities recommended by citizens of the watershed involved in the plan development process?*

Allocation of Resources

- *The Targeted Implementation Schedule distributes the annual budget to its various programs with an emphasis on “shovel-ready” water quality improvement projects.*

Funding

- *Priority was given to those actions that are not currently funded by the counties/SWCDs at a level needed to achieve the goal(s) of the Plan.*



2017 Drywood Dam Removal Project

4.2.1 Identification of Roles and Responsibilities towards Implementation

The Planning Partners will work under the direction of the Pomme de Terre River Association Joint Powers Board (PDTRA JPB) to develop policies and guidelines that will be used to address the Targeted Implementation Schedule. It is anticipated that this will include the adoption of cost share policies to define how and when funding will be used towards the measurable goals within the Planning Area. It is also anticipated that certain roles and decision authorities will be delegated to staff to allow for efficient plan implementation.

It is not anticipated that the PDTRA JPB will have a role in approving landowner contracts to install landowner projects; that role and responsibility will belong to an individual Planning Partner where the project is being installed or implemented.

The PDTRA JPB is the decision-making entity with a contracted fiscal agent and currently employs a coordinator to manage a reporting system whereas each Planning Partner or outside consultant will identify their accomplishments towards the Targeted Implementation Schedule. The PDTRA JPB has a responsibility to ensure that resources and accomplishments are being directed towards implementation activities identified and sufficient level of effort towards the measurable goals are being made.

As the Planning Partners move forward with implementing the Comprehensive Watershed Management Plan, they will be making decisions about who will be responsible for completing the various steps that go into installing individual projects or implementing activities identified in Table 4-2 through Table 4-7. It is anticipated that a variety of options will be considered during the life of the Plan to determine methods on how targeted implementation activities will best be accomplished. Consideration will be given to contracting for services, using existing Plan Partner staff, hiring staff through an identified Plan Partner or using a retainer agreement for services.

To assist with the process of identifying roles and responsibilities towards implementation, a workload analysis will be completed in conjunction with the short-term work plan and budgeting effort (biennial or triennial work plan). The purpose of the workload analysis will be to

1. *Refine the anticipated hours and costs to complete individual implementation activities based on actual fund availability;*
2. *Consider whether the implementation activity is either on-going or involves a limited duration;*
3. *Assess capacity among Plan Partner staff; and*
4. *Evaluate capacity and willingness of other Federal, State or local partners to assist with implementation.*

Conducting this workload analysis will allow the Plan Partners to have a strategic plan for both staffing and contracting needs and will be used to account for changing demands in the actual pace of progress towards goals and implementation activities.

4.3 ACCOUNTING FOR LOCAL FUNDS

Funding for implementation of the Plan will come from a variety of local, state and federal sources. One of the final steps in the development of the Targeted Implementation Schedule was to estimate current water management expenditures for the Pomme de Terre River watershed in order to set a baseline of activity. To conduct this estimate, each local unit of government and the Pomme de Terre River Association was asked to identify how much locally generated money (funds derived from the ad valorem levies, fees, services, or donations from citizens, local organizations, or local chapters of national organizations) they accounted for in one year in order to project what is expected to be used within the watershed in future years. Dollars were organized by program type. If a program was a county wide program, the dollars were prorated to only reflect the percentage of land area within the Pomme de Terre River watershed. If a program already reflected the Pomme de Terre watershed, one hundred percent of the program dollars were accounted for. Since the accounting activity only looked at 2017, some programs have no state or local dollars even though the planning entities may have received money for these programs in past or future years. A summary of estimated funds for the Pomme de Terre watershed in 2017 is provided in Table 4-8.

Federal dollars are included in the table to reflect the contributions of federal partners to the Pomme de Terre watershed. These dollars could have reflected multiple federal sources implemented by the local units of government, but upon completion of the exercise local units of government only reflected dollars that they had some role in. Federal dollars are primarily USDA-NRCS Environmental Quality Incentives Program (EQIP) dollars implemented in the Pomme de Terre watershed.



Table 4-8. Estimated Water Management Activity Funds Allocated in the Pomme de Terre watershed in 2017

Source	State Dollars in 2017	Local Dollars in 2017	Match/Local/Federal in 2017
BWSR Cooperative Weed Management Area	\$1,678	-	\$2,043
BWSR Easement Delivery	\$3,067	-	-
BWSR State Cost Share Program	\$15,674	-	\$2,749
BWSR WCA	\$19,808	-	\$18,034
BWSR Clean Water Funds - Buffer	\$25,104	-	-
BWSR Clean Water Funds - Competitive	\$170,365	-	-
BWSR Clean Water Funds – Local Capacity	\$116,382	-	\$18,842
County to SWCDs	\$116,590	-	\$1,007
County - AIS	\$52,369	-	-
County -Drainage	-	-	-
County -Feedlots	\$13,138	-	\$8,257
County -Shoreland	\$6,832	-	\$3,181
County -SSTS	\$28,706	-	-
County-Water Planning	\$16,956	-	\$6,040
Federal Dollars (USDA Programs)	-	\$4,130,091	*
Fees for Services and Products	\$45,703	-	-
Municipalities - Stormwater	-	-	-
Non-Profit Dollars	\$2,264	-	-
Non-Profit Dollars – Watershed Wide	-	-	-
Other Non-state Grants	-	-	-
Well Sealing	-	-	-
MDA MAWQCP	\$3,308	-	\$827
BWSR CREP Implementation	-	-	-
MPCA – Grants - Competitive	\$46,591	-	-
Regional Agencies	\$18,973	-	-
Conservation Delivery	\$12,711	-	-
Irrigation Scheduling	\$6,750	-	-
Farm Bill Assistance	\$31,678	-	\$7,371
County Buffer Aid	\$47,761	-	\$77,626
Septic Upgrade Cost Share	\$1,138	-	\$864
Totals	\$803,545	\$4,130,091	\$146,841
Total Local, State and Federal Dollars	\$5,080,477		

*Indicates an acknowledgement that match for federal programs from landowners is a significant resource but is currently highly difficult for Local Government staff to track.

As Table 4-8 indicates, there is approximately \$5,000,000 currently being allocated to water management activities in the Pomme de Terre River Watershed.

5 EXISTING IMPLEMENTATION PROGRAMS

The programs described below form the current baseline of watershed management in the Pomme de Terre River Planning Area and are the tools and systems that will be used to implement the actions identified in the targeted implementation schedule. These programs include incentive programs, operations and maintenance programs, a capital improvement program, regulatory and enforcement programs, data collection and monitoring, and outreach and engagement programs.

Through the Pomme de Terre River Association (PDTRA), Local Government Units utilize joint resources to coordinate like-programs within the watershed when appropriate. PDTRA will continue this coordination and information-sharing platform through the implementation of the Pomme de Terre River Comprehensive Watershed Management Plan.

5.1 INCENTIVE PROGRAMS

Incentive programs are formal programs used to encourage participation in certain activities or programs. Various mechanisms can be used for conducting incentive programs, including technical and/or financial assistance or providing other benefits for enrolling in programs. Financial incentives may be used to encourage landowners to install or adopt land management practices that improve or protect water quality. This section describes the local incentive programs that the Planning Partners will use to achieve the goals in the Plan.

SWCDs in the Planning Area intend to evaluate ranking criteria of current incentive programs that will assign higher priority to potential projects located in the Priority Area(s) and targeted drainage areas identified in this Plan which is described in more detail in Section 6.5.1 Project Selection Process.

5.1.1 Cost-Share Programs

A cost-share program is where the costs for erosion control, sedimentation control, or water quality improvements are shared between the landowner and a funding agency. Numerous cost-share programs are available at the local, state, and federal level. Cost-share programs often provide funding for structural practices (e.g. water and sediment control structures, grassed waterways, wetland restoration, or controlled drainage practices) or nonstructural practices (e.g. cover crops, no-till, or nutrient management). Landowners seeking cost-share assistance should contact their local SWCD office to obtain information on available programs.

5.1.2 Low-Interest Loans

Low- or no-interest loans provide financing at below-market rates, and are often combined with flexible repayment terms. Low- or no-interest loans can be based on a “revolving” Model where the repayments are then redistributed to new loan recipients. Low interest loans may be available for livestock waste-management system updates, septic system replacement, conservation tillage equipment, small community wastewater-treatment systems, or other projects.

5.1.3 Regulatory Assistance Programs

Regulatory assistance programs often require landowners to achieve certain standards (i.e. water quality, buffer widths, etc.) in return for (1) certainty that the standard will not change for a defined period, (2) recognition of participation, and (3) priority for other financial and technical assistance. An example of regulatory assistance is the Minnesota Agricultural Water Quality Certification program.

5.1.4 Conservation Easements



Conservation easements are voluntary legal agreements that are made by a landowner and a qualified agency or non-profit organization. These easements permanently conserve targeted resources to prevent land uses that are incompatible with the long-term health of the watershed while keeping land in private ownership. Conservation easements are available through state and local government agencies as well as several non-profit organizations such as The Nature Conservancy and the Minnesota Land Trust. Conservation easements are recorded on property deeds and inspected regularly to ensure that the provisions of the easement agreement are maintained.

The Planning Partners recognize the value in taking a comprehensive, long-term approach to land conservation by working with willing landowners and partners to protect and restore important land throughout the watershed. Landowners interested in protecting and restoring their land are encouraged to contact their County’s Soil and Water Conservation District staff to discuss options and opportunities.

5.1.5 Land Acquisition

The PDTRA partners recognize the value in taking a comprehensive, long-term approach to land conservation by working with willing landowners and partners to protect and restore important land throughout the watershed.

The following table summarizes the various incentive programs offered by the counties and Soil and Water Conservation Districts in the Pomme de Terre River watershed. The specific types of conservation practices and BMPs supported by these incentive programs is summarized in the table to clarify which programs can be accessed for implementation of the Plan.

Table 5-1. Existing Incentive Programs

Program	Funding Entity	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift		PDTRA
		C	S	C	S	C	S	C	S	C	S			
Agricultural Nonstructural Practices - Cover Crops, Conservation Tillage, Soil Health Practices, Buffers & Filter Strips														
Nonstructural Land Management Practices (NLMP)	BWSR, NRCS		X		X				X		X		X	
Working Lands	DNR				X		X				X			
Conservation Reserve Program (CRP)	FSA		X		X		X		X		X		X	
Continuous Conservation Reserve Program (CCRP)	FSA		X		X		X		X		X		X	
Conservation Stewardship Program (CSP)	NRCS		X		X		X		X		X		X	
Agriculture BMP Loan Program	MDA				X		X		X	X			X	
Agricultural Structural Practices – Water and Sediment Control Basins, Alternative, Tile Intakes, Cattle Exclusions, Waste Pit Closures, Grade Stabilization, Terraces, Grassed Waterways, Wetland Restoration														
State Cost-Share	BWSR		X		X		X		X		X		X	
Clean Water Funds Competitive Grants	BWSR		X		X		X		X		X		X	X
319 Competitive Grants	MPCA		X		X		X		X		X		X	X
Environmental Quality Incentive Program (EQIP)	NRCS		X		X		X		X		X		X	
Conservation Stewardship Program (CSP)	NRCS		X		X		X		X		X		X	
Agriculture BMP Loan Program	MDA				X		X		X	X			X	
Stormwater/Urban Practices - Well Sealing, Rain Gardens, Septic Systems														
Abandoned Well Sealing Cost-Share	County		X		X		X		X		X	X		
Septic Loan Program	MDA	X			X	X	X	X	X			X		
Clean Water Funds - Competitive Grants	BWSR		X		X		X		X		X		X	X
319 Competitive Grants	MPCA		X		X		X		X		X		X	X
Restoration/Protection - Wetland Restoration, Streambank & Shoreline Restoration/Protection														
Clean Water Funds - Competitive Grants	BWSR		X		X		X		X		X		X	X
319 Competitive Grants	MPCA		X		X		X		X		X		X	X
Wetland Restoration Program							X							
Invasive Species Management - Management of Aquatic and Terrestrial Invasive plant species														

Program	Funding Entity	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift		PDTRA
		C	S	C	S	C	S	C	S	C	S	C	S	
Cooperative Weed Management Area Program (CWMA)	BWSR		X									X	X	
Aquatic Invasive Species Prevention Aid	County	X		X		X		X			X	X		
Other Conservation Programs														
Walk-In Access Program	MN DNR		X		X				X		X		X	
Forest Stewardship Plans	USFS				X				X					
Pollinator Support					X				X		X		X	
Other Technical Assistance and Services - Services Provided by local Soil and Water Conservation Districts														
Tree Sales	SWCD		X		X				X		X		X	
Seed Sales	SWCD		X		X				X		X		X	
Drill Seeding	SWCD		X						X		X			
Contract Mowing	SWCD		X						X		X			
Equipment/No-Till Drill Rental Program	SWCD				X				X		X		X	
Irrigation Scheduling	SWCD								X				X	
Technical assistance for BMP implementation and contract development.	SWCD		X		X		X		X		X		X	

Note: C stands for County and S stands for Soil and Water Conservation District (SWCD)

* Through Ag BMP Loan Program (MN Dept of Ag)



5.2 Capital Improvements

Capital improvements are beyond the “typical” financial means of the Planning Partners and include larger, non-recurring expenditures for the construction, repair, retrofit or increased utility or function of physical facilities, infrastructure or environmental features

Capital improvement projects are often completed in cooperation with multiple entities including counties, SWCDs, watershed management organizations, cities/townships, state agencies and private landowners.

The first step in the implementation of capital is studies to identify the most appropriate project. Projects will be chosen using multiple prioritization factors such as project feasibility, cost-benefit analysis, landowner cooperation, and available financing. In many cases, ownership of these improvements and on-going operations and maintenance responsibilities reside with the landowner.

Members of the Joint Powers Board or the Planning Committee’s individual and representative Boards are expected to discuss the means and methods for funding new capital improvements with potential funding partners. Capital improvement projects completed through this Plan will be operated and maintained by the sponsoring organization.

As part of the regular review of the Pomme de Terre River Comprehensive Watershed Management Plan’s progress described in Section 6.6.1, Planning Partners will review the status of any capital projects as part of its annual work planning.

5.2.1 Drainage

The public drainage systems within the watershed are managed by drainage authorities on behalf of the landowners receiving benefit from the drainage system. The individual county governments serve as the drainage authority. These drainage systems, typically open ditches or in some cases underground tiles, were established to enhance agricultural production on lands frequently too wet to produce crops. The cost for original establishment of the public drainage system and subsequent improvements is borne by the benefitted properties. The drainage authority acts on behalf of all the benefitted property owners to assess fees for the level of drainage benefit each landowner receives. Chapter 103E of the Minnesota Statutes, known as the Minnesota Drainage Law or Drainage Code, provides the regulatory framework for managing the public drainage systems.

Additionally, under Minnesota Statute 103E.011 §Subd. 5, a drainage authority may accept and use funds from sources other than, or in addition to, those derived from assessments based on the benefits of the drainage system for the purpose of wetland preservation or restoration or creation of water quality improvements or flood control. The sources of funding authorized under this subdivision may also be used outside the benefitted area but must be within the watershed of the drainage area.

A summary of the public drainage system and the entities responsible for managing these systems is provided in Table 5-2.

Table 5-2. Summary of Public Drainage System

County	Public Drainage System(s)	Drainage Authority	Record Keeping
Big Stone	No public drainage systems in the Pomme de Terre Watershed	Big Stone County Engineer/ County	Hard copies of original plans, repair reports, etc. at Highway Dept.
Douglas	No public drainage systems in the Pomme de Terre Watershed	Douglas County	Hard copies of original plans, maintenance and repair reports. GIS shapefiles available.
Grant	County Ditch 31	Grant County	Grant County Highway Department
	County Ditch 1		
	Judicial Ditch 1		
	County Ditch 30		
	County Ditch 23		
Otter Tail	County Ditch 52 - Pelican Creek	Otter Tail County Board	Hard copy original maps. New is in electronic maps. Maintenance and repair reports are electronic and hard copy.
	Judicial Ditch 3		
	County Ditch 30		
	County Ditch 43		
	County Ditch 70		
	County Ditch 10		
	County Ditch 67(R) – Unnamed Stream		
	County Ditch 11		
Stevens	County Ditch 2	Stevens County Engineer/County	Yearly status reports, digital and hard copy maps, surveys and maintenance reports. Ditch map available on Stevens County website.
	County Ditch 3		
	County Ditch 4 – Muddy Creek		
	County Ditch 5 – Unnamed Stream		
	County Ditch 10		
	County Ditch 11		
	County Ditch 14		
	County Ditch 16		
	County Ditch 17		
	County Ditch 18		
	County Ditch 21 – Unnamed Stream		
	County Ditch 22 – Unnamed Stream		
	County Ditch 25		
	County Ditch 43		
	County Ditch 31		
Judicial Ditch 2			
Swift	County Ditch 63 Branch 4B	Swift County	Hard copies and GIS shapefile
	County Ditch 63		
	County Ditch 81		
	Judicial Ditch 2		

5.2.2 Permanent Protection

Permanent protection measures are necessary to ensure conservation areas are protected in perpetuity, in an undisturbed, natural state and to ensure that projects, designed to meet the goals of the Plan, are operated and maintained at an effective performance level.

Permanent protection is typically provided via a conservation easement. An easement is a limited right of use that one entity has on someone else's property. The Planning Partners' role in acquiring conservation easements would likely entail connecting private landowners to existing state and Federal programs so that the landowner could enter into a binding agreement to preserve the property. Under an existing program, the State or Federal government would hold the easement and be responsible for enforcing its conditions. The land-use restrictions placed on the property would remain in place even if the property changes ownership.

Permanent protection over a project would work in a similar fashion. Typically, stormwater management projects and BMPs, whether regional facilities or located on an individual property, are protected by a drainage or utility easement. These easements are needed for draining water (stormwater runoff) and installing utilities such as water, sewer and storm sewer lines, gas lines, and buried phone, electric, and cable lines. They are also needed to ensure that access is provided for ongoing maintenance of the BMPs. These easements are usually created when a property is developed and are typically located along border lot lines. However, some properties contain easements that are not placed in these typical locations. Easements can also serve as protective buffers for environmentally sensitive areas such as lakes, streams, and wetlands. Like conservation easements, these easements would remain in place if the property changes ownership. In this case, the Planning Partners would not have a role in the acquisition of a drainage and utility easement or recorded buffer as these requirements typically fall under existing city or county ordinance.

A summary of permanent protection programs and the entities responsible for managing these programs is provided in Table 5-3.

Soil and Water Conservation Districts also promote many other easement programs provided by State, Federal, and Non-Governmental entities though they may not be the main contact for implementation. Program include but are not limited to:

- *US Natural Resource Conservation Service: Agricultural Conservation Easement Program,*
- *US Fish and Wildlife: Wetland, Tallgrass Prairie, and Grassland Easements,*
- *MN Department of Natural Resources-Native Prairie Bank,*
- *Board of Water and Soil Resources-Wetland Bank and Mitigation easements, and other Fee Title options.*

Table 5-3. Summary of Permanent Protections

Program	Funding Entity	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift	
		C	S	C	S	C	S	C	S	C	S	C	S
Land Retirement Programs including RIM/Federal Easements – state’s RIM program and USFWS has permanent easements, USDA wetland restoration easement program (WREP)													
Conservation Reserve Enhancement Program (CREP)	FSA		X		X		X		X		X		X
Reinvest in Minnesota (RIM)	BWSR		X		X		X		X		X		X
Local Easements													
SWCD Conservation Easement							X						



Easement in the Northern region of the Watershed

5.3 OPERATION AND MAINTENANCE

Municipal and county governments, as well as watershed management entities are responsible for inspecting, operating and maintaining stormwater infrastructure projects, public works, facilities, and natural and artificial watercourses completed or owned by the county, municipality or watershed management entity.

Operations and maintenance of any capital improvement implemented through this Plan will be the responsibility of the landowner where the practice is installed, unless an alternative agreement is made. After construction of a project, the responsible party will perform regular inspections and maintenance to ensure the project functions at its design capacity over its intended life expectancy. Operation and Maintenance plans must be prepared before construction and should include the expected activities, timing of activities, and inspection schedule. In addition, the Operation and Maintenance plan should include the procedural activities that will take place in the event inspections determine that maintenance is required or if required maintenance has not been performed, including potential penalties or enforcement actions. Minnesota State Rules Chapter 8400.1700 and 8400.1750 outline the program requirements for the projects funded through state cost-share programs.

While there are numerous public works/facilities (e.g. bridges, culverts, dams, wastewater treatment facilities) located in the Pomme de Terre River Planning Area, the counties have the Operation and Maintenance Programs in place to ensure that this infrastructure is operating as designed. Additionally, each county’s drainage management program addresses the on-going Operation and Maintenance needs of the public drainage system as described in Section 5.2.1.

The Pomme de Terre River Association has Operation and Maintenance Plans for raingardens, shoreline restoration projects, and pasture buffers. Landowners are required to have a maintenance plan in place for lakeshore/streambank protection projects and WASCObS when the PDTRA provides cost-share for project implementation. Inspections of these practices/projects are made by SWCD staff every 1st, 5th and 9th year of the project.

Table 5-4. Existing Operations & Maintenance Programs

Program	Funding Entity	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift		PDTRA
		C	S	C	S	C	S	C	S	C	S			
Ditch inspection						X		X		X		X		

Note: C stands for County (including Cities) and S stands for SWCD

5.4 Regulation and Enforcement

Many of the Planning Area’s priority concerns can be addressed, at least partially, through local regulations and policies, especially zoning and other land use ordinances. This plan calls for local authorities (counties) to maintain local regulatory controls, and certain land management practices, as well as improved coordination by the Planning Partners of regulatory activities to reduce impacts from altered drainage, and increased groundwater demands. The Planning Partnership does not intend to develop or enforce any of its own regulations or policies. Instead the Planning Partners will coordinate enforcement with local governmental authorities.

5.4.1 County Regulation

Minnesota statutes administered by the Planning Partners are described below. The responsibility for implementing these authorities will remain with the respective counties. There are multiple types of state law and local ordinances in the Pomme De Terre River Planning Area:

- Subsurface Sewage Treatment Systems
- Wetland Conservation Act
- Shoreland Management
- Floodplain Management
- Feedlot Management
- Buffer Management
- Soil Loss Ordinances
- Noxious Weed Law
- Zoning, Erosion and Sediment Control and Stormwater Management

The following subsections provide detail regarding these few selected laws or ordinances:

Subsurface Sewage Treatment Systems (SSTS) Program

These regulations cover subsurface sewage treatment systems, also known as septic systems. The major goals of SSTS programs are to protect the public health and the environment through effective, modern treatment of domestic sewage from residences or other small-scale establishments. SSTS regulations are based on the following state laws:

1. *Minimum technical standards for individual and mid-size SSTS (Chapter 7080 & 7081);*
2. *A framework for local administration of SSTS programs (Chapter 7082) and;*
3. *Statewide licensing and certification of SSTS professionals, SSTS product review and registration, and establishment of the SSTS Advisory Committee. (Chapter 7083).*

Wetland Conservation Act (WCA)

The Wetland Conservation Act was designed to maintain and protect Minnesota's wetlands and the benefits they provide and reach the goal of no-net-loss of wetlands. The Wetland Conservation Act requires any proposal to drain, fill, or excavate to follow these guidelines: 1) avoid all wetland disturbances; 2) If unable to avoid impact, minimize any impact on the wetland; and, 3) replace any lost wetland acres, functions, and values. Some activities are exempt from replacement, check with your local agency. The Wetland Conservation Act is administered under Minnesota Administrative Rules, Chapter 8420, Wetland Conservation.

Shoreland Management Ordinances

Minnesota state law (Minn. Rules §§ 6120.2500 – 6120.3900) delegates authority to regulate shorelands to Local Government Units. Shorelands include both river and lake shore areas. This authority includes regulating the subdivision, use, and development of shorelands along public waters to preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources. Local governments enforce this statute with a land use ordinance requiring a 50 foot buffer around public waters. These ordinances are the backbone of land use controls to protect and provide orderly development of Minnesota's shorelands.

Floodplain Management

Floodplain zoning regulations are designed to minimize loss of life and property, disruption of commerce and governmental services, extraordinary public expenditure for public protection and relief, and interruption of transportation and communication during a flood threat. Risk Mapping, Assessment, and Planning (Risk MAP) is a Federal Emergency Management Agency (FEMA) program that helps communities identify, assess, and reduce their flood risk. By combining quality engineering with updated flood hazard data, FEMA provides accurate and easy-to-use information to enhance local mitigation plans, improve community outreach, and increase local awareness to flood hazards. The Local Government Units will participate and share any information about data that may be available that could be utilized to more accurately map flood risk.

Feedlots

The Minnesota Pollution Control Agency (MPCA) established rules for local governments to manage feedlot in Minn. Rules § 7020. Counties may be delegated by the MPCA to administer the program for feedlots that are not required to have a state or federal operating permit. The feedlot rule regulates the collection, transportation, storage, processing and disposal of animal manure and livestock processing activities and provides assistance to counties and the livestock industry. The rules apply to all aspects of livestock production areas including the location, design, construction, operation and management of feedlots, feed storage, stormwater runoff and manure handling facilities. Most counties provide feedlot regulatory oversight and technical assistance programs and maintain a feedlot inventory.

Buffer Management

In 2015, the Minnesota legislature enacted the Buffer and Soil Loss Legislation (Minnesota Statute, Section § 103F.48), commonly referred to as the Minnesota Buffer Law. This law requires a 50-foot average, 30-foot minimum width, continuous buffer of perennial vegetation around public waters identified in the DNR Buffer Protection Map. Additionally, a 16.5-foot minimum width continuous buffer of perennial vegetation is mandatory along all public drainage systems. In some cases where a County may be enforcing its own buffer ordinance, the County-specific ordinance will take precedence over the Minnesota Buffer Law. Additionally, a list of Alternative Practices, approved by the local County, Soil and Water Conservation District, and BWSR, may be installed in lieu of a buffer where practices have an equivalent water quality benefit.

This Law also requires “Other Waters” (waterways not identified in the DNR Buffer Protection Map) to be summarized for protection through the Local Water Plan approved by Counties and Soil and Water Conservation Districts through an amendment. Amendments may be referred to in the Land and Water Resource Inventory.

Noxious Weed Law

The Noxious Weed Law addresses plants that are noxious because they can harm people, animals, the foods we eat, and nature. The Minnesota Department of Agriculture, county, city and township officials inspect land and ask owners to control and eradicate noxious weeds that are present in order to keep them from spreading and harming neighboring lands. Landowners that refuse to comply with an order to control noxious weeds are in violation of

the Noxious Weeds Law and are subject to having the county contract the work to be performed, with all costs being added to their property taxes, or a summons to district court.

Zoning, Erosion and Sediment Control and Stormwater Management

County zoning and subdivision ordinance controls promote the public health, safety and general welfare of the public; protect agricultural land from urban sprawl; and provide a basis for the orderly development of land resources. The county zoning ordinance addresses land use impacts on steep slopes, impacts of grading and filling, erosion and sediment control and stormwater management requirements. Some counties have a resolution to their right-of-way ordinance to refrain from farming the ditch bottoms, which may or may not include signage. It should be noted that member communities also have stormwater ordinances, which regulate the impacts of stormwater to the watershed’s lakes, rivers, streams and wetlands.

5.4.2 Regulatory & Enforcement Programs

In many cases, the counties maintain and administer the regulatory program while enforcement activities are delegated to the Soil and Water Conservation Districts.

For specific details about each planning partner’s programs, see Table 5-5, below. Information regarding which department administers the program is included in the Table.

Table 5-5. Existing Regulatory and Enforcement Programs

Program	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift	
	C	S	C	S	C	S	C	S	C	S	C	S
Riparian Buffer Ordinance (Buffer Initiative)	X		X		X		X	X	X		X	
Erosion Control & Stormwater Management	X		X		X						X	
Feedlot Ordinance	X		X						X		X	
Floodplain Management	X		X		X				X			
Noxious Weed Law			X		X		X	X		X	X	X
Shoreland Management	X		X		X		X		X		X	
Soil Loss Ordinance												
Subsurface Sewage Treatment System Program	X		X		X		X		X		X	
Wetland Conservation Act Authority	X			X	X		X			X	X	
Zoning Ordinance	X		X						X		X	
Right-of-Way Ordinance/Policy	X						X		X			

Note: C stands for County and S stands for SWCD

5.4.3 Comprehensive Land Use Plans

A comprehensive plan is a document that outlines the general policies and goals of the county and should be considered as the county reviews, creates and amends ordinances and regulations, considers County Board resolutions on specific issues and established procedures for policy-making. Most of the counties have a Comprehensive Land Use Plan which guides the various land uses in the watershed.

5.5 INFORMATION, OUTREACH, AND EDUCATION PROGRAMS

Public Participation and Engagement programs utilize education and outreach to address issues impacting a priority concern and make progress towards a measurable goal. The underlying goals are to raise awareness of water resources, and to encourage behavior that benefits the watershed.

Table 5-6. Existing Public Participation and Engagement Programs

Program	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift		PDTRA
	C	S	C	S	C	S	C	S	C	S	C	S	
Aquatic Invasive Species Plan	X		X		x		X	X		X	X		
MN Agricultural Water Quality Certification Program (MAWQCP)		X		X		X		X		X		X	
Awards Program				X		X		X		X		X	
K-12 Education (e.g. Envirothon, field trips)	X		X	X		X		X		X		X	X
Nitrate Testing		X		X		X		X		X		X	
Household Waste Management Program (e.g. Take it to the Box, Waste Pesticide Collection Program)	X		X		x		X		X		X		
Outdoor Education Days (e.g. Conservation Tours, Field Days)		X		X		X		X		X		X	X
Social Media Program		X	X	X	X		X	X	X	X	X	X	X
Tours and Demonstrations				X		X		X		X		X	X
Newsletter		X		X				X		X		X	
Shoreland Protection and Restoration		X	X	X		X		X		X		X	

Note: C stands for County and S stands for SWCD

5.6 Data Collection and Monitoring

The Planning Partners have a solid baseline of programs to collect data and monitor various components across the Planning Area. These programs will dovetail with efforts to assess the impacts of the One Watershed, One Plan targeted actions.

Table 5-7. Existing Data Collection & Monitoring Programs

Program	Funding Entity	Big Stone		Douglas		Grant		Otter Tail		Stevens		Swift		PDTRA
		C	S	C	S	C	S	C	S	C	S	C	S	
Precipitation Monitoring *	DNR / NWS		X		X		X		X		X		X	
Surface Water Monitoring	MPCA				X				X		X		X	X
GIS Inventory of Wells & Septic Systems	SWCD								X					
Observation Well Monitoring (levels)**	DNR		X		X				X		X		X	
Well Water Testing	MDH		X		X		x		X				X	
Intensive Watershed Monitoring (10 year cycle)	MPCA													X

Note: C stands for County and S stands for SWCD

*Volunteer run program – reported to Minnesota State Climatology Office

**Monitored for the MN DNR



5.6.1 County and Soil and Water Conservation District (SWCD) Monitoring Data

Stevens County

Table 5-8. Lakes historically (prior to 2007) monitored by Stevens County

Lake Name	Perkins	Hattie
Lake ID	75-0075-00	75-0200-00

Table 5-9. Stream sites historically monitored by Stevens County

Stream Station	Pomme de Terre R. at CSAH-8, 5 Mi. S. of Morris	Pomme de Terre R. at CR-74, 7 Mi. NE of Morris	Pomme de Terre R. at CR-76, 11 Mi. NE of Morris
Station ID	S002-884	S002-885	S002-886

Table 5-10. Stream sites historically monitored by Stevens County

Stream Station	Pomme de Terre R. at CSAH-10, 3 Mi SE of Morris	Pomme de Terre R. at CSAH-20, 9 Mi NE of Morris	Pomme de Terre R. at MN-9, 2 Mi SE of Morris	Pomme de Terre R. at CSAH-5, 2.5 Mi S of Morris	Pomme de Terre R. at US-59, 4.5 Mi S of Morris
Station ID	S002-887	S002-888	S004-411	S004-592	S004-593

Grant County Soil and Water Conservation District

Table 5-11. Lakes historically monitored by the Grant County SWCD

Lake Name	Pelican	Elk	Barrett	Pomme de Terre
Lake ID	26-0002-00	26-0040-00	26-0095-00	26-0097-00

Table 5-12. Stream sites historically monitored by the Grant County SWCD

Stream Station	UNN STR (Pelican Lk. outlet) at CSAH-10, 1.5 Mi. S of Ashby	UNN STR (Pelican Lk. inlet) at CSAH-82, 2.5 Mi. E of Ashby	Pomme de Terre R. at CR-36, 1.7 Mi. N of Barrett
Station ID	S004-581	S004-582	S004-583

Table 5-13. Stream sites historically monitored by the Grant County SWCD

Stream Station	Pomme de Terre R. at CR-52, 5 Mi. NE of Elbow Lake	Pomme de Terre R. below dam at PDT LK, 4 Mi. E of Elbow Lake	Pomme de Terre R. at CSAH-2 (Hawkins Ave) at Barrett
Station ID	S004-585	S004-586	S004-584

Swift County

Table 5-14. Stream sites historically monitored by Swift County

Stream Station	Pomme de Terre R. on CSAH 20, 7 Mi. NW of Holloway	Pomme de Terre R. at US 59, 2.25 Mi. NE of Appleton	Pomme de Terre R. at 190 th Ave. 4 Mi. NW of Holloway	Pomme de Terre R. at CSAH-7, 7 Mi. N of Holloway	Pomme de Terre R. AT CSAH-22, 9 Mi. NW of Holloway	Pomme de Terre R. AT CSAH-36, 3 Mi. NE of Appleton	Drywood Creek at CR-55, 13 Mi. NW of Holloway	Pomme de Terre R. at CR-56, 6 Mi. NW of Holloway
Station ID	S001-710	S001-725	S004-570	S004-571	S004-572	S00-573	S004-574	S004-575

Table 5-15. Stream sites historically monitored by Swift County

Stream Station	Pomme de Terre R. at US-12 Bridge, 3 Mi. NE of Holloway	Pomme de Terre R. AT 185 th Ave, 6 Mi. NW of Holloway	Drywood Crk. at 190 th Ave, 11.5 Mi NW of Holloway	Pomme de Terre R., 70th ST NW, 10 Mi. N of Holloway	Pomme de Terre R. ON CR-51 (Before Marsh Lake) 2 Mi. S Appleton	Pomme de Terre R. UPSTR OF MN-119 / MN-7 / US-59 at Appleton
Station ID	S004-576	S004-577	S004-578	S004-579	S004-580	S000-195



Pomme de Terre River - Appleton

5.6.2 Federal, State, and Private Organizations

Pomme de Terre River Association

- **Major Watershed Project**

- This project was developed in accordance with the MPCA Major Watershed initiative. It was completed in June of 2013 with the main goal to prioritize project locations for a more targeted use of funding from government agencies. The document lists areas where voluntary practices and projects could be implemented in the watershed to improve water quality, habitat, and recreational value. Monitoring for this project was conducted in 2012 and started up again in 2017 - 2018 for the second cycle.

- **Surface Water Assessment Grant (SWAG) monitoring**

- This grant is provided by the MPCA to local groups that expand their overall capacity to conduct monitoring. The SWAG was granted to the Pomme de Terre River Association in 2017 and has been used for monitoring lakes and stream sites. The data from lakes monitored for this grant are in Table 5-16 and stream sites monitored are in Table 5-17.

Table 5-16. Lakes monitored for Pomme de Terre SWAG

Lake Name	Ina	Barrett	Middle	South Turtle	North Turtle	Johnson	Sewell	Fiske	Oliver (East)	Oliver (West)	N. Dry-wood
Lake ID	21-0355-00	26-0095-00	56-0252-00	56-0377-00	56-0379-00	56-0393-00	56-0408-00	56-0430-00	76-0146-01	76-0146-02	76-0169-00

Table 5-17. Stream sites monitored for the Pomme de Terre SWAG

Stream Station	Pomme de Terre R. UPSTR of MN-119 / MN-7 / US-59 at Appleton	Pomme de Terre R at CR-76, 11 Mi NE of Morris	Pelican Crk at 160th AVE, 3 Mi SW of Ashby	Pomme de Terre R at MN-9, 2 Mi SE of Morris	Muddy Crk at 490th AVE, 3 Mi SW of Morris	Drywood Crk at 200th Ave NW, 12 Mi SE of Alberta	Pomme de Terre River
Station ID	S000-195	S002-886	S004-410	S004-411	S004-412	S004-13	S009-449

Biotic Stressor Identification Study

- Monitoring was conducted by the MN Pollution Control Agency (MPCA) for a study of local stressors limiting biotic communities in the watershed. The document was produced in June of 2012 and used data collected by the MPCA and the Pomme de Terre River Association.

- **Other Monitoring**

- The Pomme de Terre River Association has collected other monitoring data not directly associated with the projects listed above. This monitoring includes “Watershed Project Monitoring” in 2010 to 2012 and “Water Monitoring” in 2007 to 2008.

Minnesota Coalition of Lakes Association (MN COLA)

This is a volunteer organization committed to preserving, protecting, and improving the waters and shore lands of the State of Minnesota through advocacy, education, and sharing of best practices. Organizations join as members and work in their jurisdictions to continue and extend the work of the MN COLA. These organizations are partaking in the Lakes Monitoring Program, explained below. Volunteer monitoring is conducted by some of the member organization, including the Otter Tail County COLA and others. This volunteer work contributes to the “Lakes Monitoring Program” described below.

Lakes Monitoring Program

In this program, monitoring of lakes in the region is conducted by volunteers. Over 500 volunteers are trained annually by RMB Environmental Laboratories staff to collect samples. The ultimate goal of the program is to quantify the physical, chemical, and biological condition of lakes to be used for future research analysis.

Table 5-18. Lakes monitored for the Lake Monitoring Program

Lake Name	Spitzer	Eagle	Jolly Ann	S. Turtle	N. Turtle	Long	Johnson	Sewell
Lake ID	56-0160-00	56-0253-00	56-0370-00	56-0377-00	56-0379-00	56-0390-00	56-0393-00	56-0408-00

Table 5-19. Lakes monitored for the Lake Monitoring Program

Lake Name	German	Fiske	Stalker	Clear	Ten Mile	Un named	Swan
Lake ID	56-0423-00	56-0430-00	56-0437-00	56-0559-00	56-0613-00	56-0780-00	56-0781-00

Minnesota Pollution Control Agency (MPCA)

This agency provides multiple services to the Pomme de Terre Watershed. Some of these services are described below.

- **Watershed Restoration and Protection Strategies (WRAPS)**

- The most recent WRAPS study was completed in March of 2013. It provides monitoring information over a 10-year cycle to assess the results of the data and develop strategies for restoration.

- **Total Maximum Daily Load (TMDL) Assessments**

- A TMDL assessment was completed for this watershed by the MPCA in January of 2015. This study included 5 reaches of Dry Wood Creek and 1 reach of the Pomme de Terre River. It also included North Turtle Lake in Otter Tail County, Christina Lake in Douglas County, and Perkins Lake and Hattie Lake, in Stevens County.

- **Citizen Stream and Lake Monitoring**

- Monitoring program primarily collecting Secchi disk depth for lakes and Secchi tube measurements for streams. Data from this program are used in stream and lake assessments and to develop reports on watershed health and improvement strategies.

Table 5-20. Lakes monitored for the MPCA Citizen Lake Monitoring Program

Lake Name	Pelican	Elk	Barrett	Pomme De Terre	(Null)	Torgerson	Middle	Eagle
Lake ID	26-0002-00	26-0040-00	26-0095-00	26-0097-00	26-0117-00	56-0251-00	56-0252-00	56-0253-00

Lake Name	Jolly Ann	S. Turtle	N. Turtle	Long	Sewell	Fiske	Stalker	Clear
Lake ID	56-0370-00	56-0377-00	56-0379-00	56-0390-00	56-0408-00	56-0430-00	56-0437-00	56-0559-00

Lake Name	Ten Mile	Hansel	Indian	Larson	Fossan	Swan	Perkins	Hattie
Lake ID	56-0613-00	56-0615-00	56-0639-00	56-0651-00	56-0656-00	56-0781-00	75-0075-00	75-0200-00

Table 5-21. Stream sites monitored for the MPCA Citizen Stream Monitoring Program

Stream Station	Pomme de Terre R, 3.1 Mi NW of Dalton	Pelican Crk at BRG on UNN RD, 2 Mi SW of Ashby	Pomme de Terre R at CR-51 BRG, 5.5 Mi W of Ashby	Pomme de Terre R on CR-47 BRG, 5.5 Mi N of Barrett	Pomme de Terre R at BRG on UNN ROAD, 4 Mi S of Barrett	Pomme de Terre R at Township RD 179, 4 Mi SW of Hoffman	Muddy Crk at 490th Ave, 3 Mi SW of Morris	Pomme de Terre R AT CSAH-37, 4.5 Mi SW of Dalton
Station ID	S001-890	S002-055	S002-056	S002-057	S002-058	S002-414	S004-412	S004-510

- **Watershed Pollutant Load Monitoring Network**

- The MPCA monitors pollutant loads in Minnesota’s rivers and streams to assist in watershed modeling, determining sources of pollutants, and developing reports around the state.

Table 5-22. Stream sites monitored for the MPCA Major Watershed Pollutant Load Monitoring Network

Stream Station	Pomme de Terre R. UPSTR OF MN-119 / MN-7 / US-59 at Appleton	Pomme de Terre R. at CR-76, 11 Mi NE of Morris
Station ID	S000-195	S002-886

Minnesota Department of Natural Resources (DNR)

This agency provides multiple monitoring services that benefit the Pomme de Terre Watershed including wetland monitoring, groundwater monitoring, surface water monitoring, and a watershed health assessment.

- **Wetland Monitoring**
 - The MN DNR has conducted random sample surveys since 2006 using both GIS technology and sample plots in the field. These surveys are used to understand the gain and loss of wetlands in the state of Minnesota.
- **Groundwater Monitoring**
 - Monitors groundwater levels through a series of observation wells located statewide.
- **Surface Water Monitoring**
 - Maintains a flow gauge on the Pomme de Terre River near Hoffman.
- **Geomorphic Assessments**
 - Conducts geomorphic assessment at the same seven sites evaluated during WRAPS Cycle 1 once every ten years.
- **Shallow Lakes Program**
 - This program is focused on wildlife enhancement in the shallow water zone, generally less than 15 feet deep, the zone that provides the most important wildlife habitat. Monitoring is conducted in many of these lakes to develop strategies to protect and enhance wildlife habitat.

Table 5-23. Lakes monitored for the MN DNR Shallow Lakes Program

Lake Name	Artichoke	Anka	Christina
Lake ID	06-0002-00	21-0353-00	21-0375-00

Table 5-24. Lakes monitored for the MN DNR Shallow Lakes Program

Lake Name	Little	Tamarack	Unnamed	Harstad Slough	Clear	Flax	Gorder	Unnamed
Lake ID	26-0076-00	56-0433-00	56-1083-00	75-0161-00	75-0192-00	75-0201-00	75-0203-00	75-0209-00

- **Sentinel Lakes**
 - This is a monitoring program for Minnesota’s most common lakes. This information is collected for the purpose of developing management approaches to address negative impacts caused by development. The only lake in the Pomme de Terre Watershed currently being monitored for this program is Artichoke Lake. Artichoke Lake is a Tier 2 Sentinel Lake and is not sampled annually. The next sampling of Artichoke Lake by MPCA will be in 2027-2028. The information available is shown in the table below.

Minnesota Department of Agriculture (MDA)

- **Surface water quality monitoring**
 - The MDA runs this monitoring program to provide information on the concentrations of agriculture chemicals, including pesticides and fertilizers, in surface waters. Data is available for only one stream site in the Pomme de Terre watershed.

Table 5-25. Stream site monitored for the MDA Surface Water Pesticide Water Quality Monitoring Program

Stream Station	Pomme de Terre R. UPSTR of MN-119 / MN-7 / US-59 at Appleton
Station ID	S000-195

- **Groundwater quality monitoring**

- This program operated by the MDA provides detailed information on the concentrations of agriculture chemicals, including pesticides and fertilizers, in groundwater. Its focus is to monitor vulnerable groundwater in the agricultural and urban areas of the state. Three groundwater monitoring sites have been tested every year since 2004 in the Pomme de Terre River Watershed.

Minnesota Department of Health (MDH)

- **Minnesota Well Index**

- This index provides information on the wells and borings in Minnesota. Information includes location, depth, geology, construction, and static water level. The wells can be found through a web-based map or a text search.

- **Public Water Supply Testing & Monitoring**

- The MDH monitors and tests for contaminants found in public water supply source waters. This includes manganese, radionuclides, nitrate, and more. Reports can be found on their website. MDH works with public water suppliers to establish Drinking Water Supply Management Areas and Wellhead Protection Plans.

United States Geological Survey

- The USGS has many resources available for monitoring. For example, the National Water Information System (NWIS) is an application that provides long-term storage of water data. Through this program, information for the Pomme De Terre Watershed includes:
 - *A site inventory of wells grouped by county,*
 - *one real-time streamflow station (the Pomme de Terre River at Appleton, Minnesota) including daily (discharge and gage height) and monthly (discharge mean) streamflow data,*
 - *water quality samples grouped by county, and*
 - *groundwater inventory levels grouped by county.*

This information can be found on the USGS website under the Pomme de Terre watershed.

United States Environmental Protection Agency (U.S. EPA)

- **National Lakes Assessment**

- This program is a statistical survey of the current condition of lakes, ponds, and reservoirs in the United States.

Table 5-26. Lakes monitored for the U.S. EPA National Lakes Assessment

Lake Name	Un-named (West)	Un named	Fiske	Fiske	Un name d	Silver	Un-named	Un-named	Un name d	North Drywood
Lake ID	26-0043-02	26-0111-00	56-0430-00	56-0430-00	56-0630-00	75-0164-00	75-0205-00	75-0205-00	76-0166-00	76-0169-00

5.6.3 Monitoring Sites

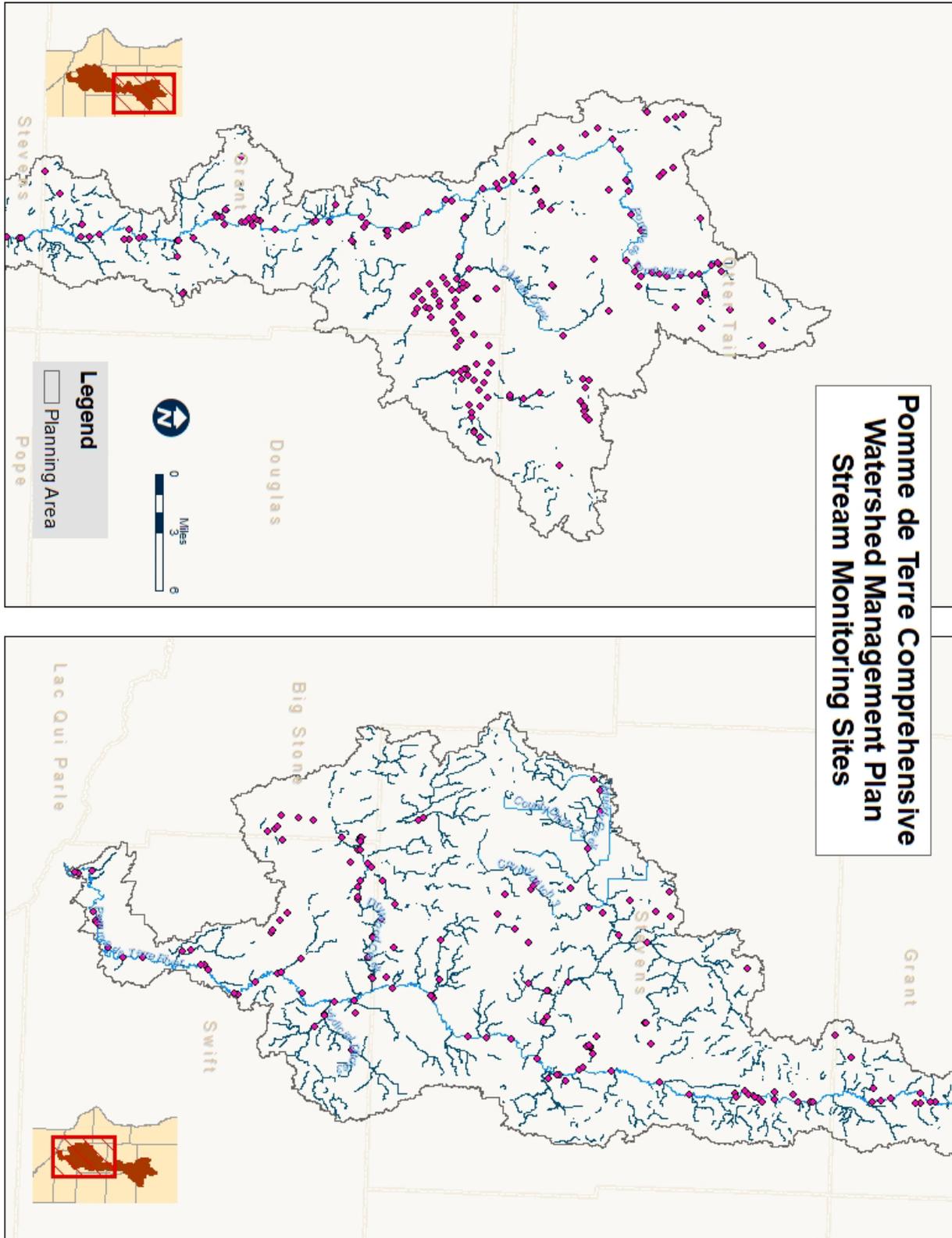


Figure 5-1. All streams in the Pomme de Terre Watershed with Monitoring Data

**Note: some stream sites are shown that have monitoring parameters not listed in the preceding tables.*

5.6.4 Assessment of Plan Progress

In the short-term, implementation of activities and measuring progress toward goals will be tracked by project type as described in Table 6-2. In the long-term, the Planning Partners will use monitoring data to assess trends in water quality improvement. It should be recognized that there are other factors which will confound the direct relationship between watershed activities and changes in resource trends such as climate change, land-use patterns and drainage management.

Table 5-27 identifies the information available to evaluate progress toward the Plan’s goals as well as any new monitoring needed to improve understanding of baseline conditions or assess particular resources.



Table 5-27. Existing monitoring data available to evaluate progress toward the Plan goals

Priority Resources	Biology	Water Quality	Water Quantity
High Quality Lakes	Fish and Aquatic Plant Surveys	Total Phosphorus, Chlorophyll-a, and Secchi Depth	Lake Levels
Clear (56-0559)	Y	All 2017-2018	Y
Eagle (56-0253)	Y	All 1996-2018	Y
Elk (26-0040)	Y	All 1991-2018	Y
Pelican (26-0002)	Y	All 1991-2018	Y
South Turtle (56-0377)	Y	All 2009-2017	Y
Spitzer (56-0160)	N	All 2009-2018	Y
Stalker (56-0437)	Y	All 1998-2017	Y
Poor Quality Lakes	Fish and Aquatic Plant Surveys	Total Phosphorus, Chlorophyll-a, and Secchi Depth	Lake Levels
Artichoke (06-0002)	Y	All 2008-2018	Y
Barrett (26-0095)	Y	All 1991-2017	Y
North Turtle (56-0379)	Y	All 2009-2018	Y
Perkins (75-0075)	Y	All 1992-2018	Y
Pomme de Terre (26-0097)	Y	All 1991-2018	Y
Christina (21-0375)	N	All 1999-2006	Y
Pollutant Impaired Streams	Fish and Macroinvertebrate Community Surveys	Total Phosphorus and Total Suspended Solids Concentrations	Continuous Daily Stream Flows
Drywood Creek	Y	Both 2007-2018 – data at multiple stations (3)	N
Lower Pomme de Terre River	Y	Both 1972-2018 – data at multiple stations (23)	Y
Groundwater	N/A	Arsenic, nitrate and manganese concentrations	Groundwater Levels
Drinking Water Protection	N/A	Nitrate-nitrogen concentrations	N/A
Groundwater Conservation	N/A	Gap: develop groundwater (GW) monitoring program	Gap: develop GW monitoring program
Altered Hydrology	N/A	N/A	Lake Levels, Stream Gauge & Peak Stream Flows
Pomme de Terre River	N/A	N/A	Y
Monitoring data collected by:			
MDH	DNR	MPCA	Volunteers

5.6.5 Data Collection, Analysis and Sharing Locally Collected Data

The Planning Partners and other entities involved in data collection are committed to performing periodic analysis of the data for quality control purposes (monthly) and to evaluate trends (every 5 years). The Planning Partners are also committed to continuing to collect data in a manner that is consistent with state compatibility guidelines and will submit locally collected data to the appropriate state agency for entry into public databases (e.g. Environmental Quality Information System, EQUIS).

5.7 PROGRAMMATIC GAPS

The Planning Partners currently rely on the 10-year Watershed Restoration and Protection Strategy monitoring cycle to assess water quality changes. This plan is based on the assumption that there will be another round of monitoring in 2027, that Watershed Pollutant Load Monitoring Network monitoring will continue at the two sites along the Pomme de Terre River near Morris and Appleton, and that there will be continued coordination of the MCPA Citizen Stream and Lake Monitoring Program. However, future monitoring efforts will depend on available funding levels through the MPCA.

Other future planning efforts on the local level include working with Lake Associations to obtain annual lake data. There may be future opportunities to increase voluntary citizen monitoring within the watershed through a locally-led voluntary effort.

The Planning Partners and state agencies recognize that these gaps need to be addressed in order to establish baseline conditions and to track performance over time.

Programmatic gaps for public drainage system management by drainage authorities include:

- Modernization of ditch management – Implement systems that allow staff to better track drainage improvements, view historic documents, upload drainage files, create and track maintenance requests, conduct inspections and report violations from mobile devices, etc.
- Connecting the drainage authorities to other sources of outside funding for maintenance (e.g. BWSR’s Multi-Purpose Drainage Management Grant Program).

No other programmatic gaps to implement the Comprehensive Watershed Management Plan were identified by the Planning Partners.

6 PLAN ADMINISTRATION AND COORDINATION

The Targeted Implementation Schedule (Section 4) and the Plan Implementation Programs (Section 5) will be coordinated between the Counties, the Soil and Water Conservation Districts, and the other partners through decision making and staffing, collaboration, funding, and work planning.

6.1 ORGANIZATION STRUCTURE OR FORMAL AGREEMENTS

The Pomme de Terre River One Watershed, One Plan is a coalition of Counties and Soil and Water Conservation Districts who make up the existing Joint Powers Board and Technical Advisory Committee. The Association currently operates under a Joint Powers Agreement, By-Laws, and has Shared Services contracts in place between each of the Local Entities partaking in grant allocations.

An amendment to the Joint Powers agreement was passed by the Pomme de Terre River Association Joint Powers Board for the purpose of implementing this Plan. The legal name defined under this Joint Powers Agreement is the Pomme de Terre River Joint Powers Board. A copy of the Joint Powers Agreement being is attached as Appendix D.

6.2 DECISION-MAKING AND STAFFING

The Pomme de Terre River Association (PDTRA) is a functioning watershed-based entity that provides the ability for both Joint Powers Board members and landowners to address issues on a watershed scale rather than by individual geographical areas of each local unit of government. Founded in 1981, the PDTRA created a partnership between Otter Tail, Grant, Douglas, Stevens, Big Stone, and Swift Counties and Soil and Water Conservation Districts (SWCD).

The PDTRA does not have land use authority or taxing authority. Those authorities are maintained by the individual local units of government. However, the PDTRA does have decision making authority for pursuing and managing federal or state grant opportunities, allocating local funding sources and implementing the Plan. PDTRA and local partners will be responsible for reviewing and approving the Plan prior to submittal to the Board of Water and Soil Resources and adopting the Plan. PDTRA and locals will also be responsible for making amendments as needed and for measuring results over the ten-year timeframe of the Plan.

Through collaborative planning and funding, the PDTRA promotes and provides technical assistance and cost-share for voluntary conservation practices, provides education and outreach opportunities, participates in water quality monitoring, and engages in prioritized planning Best Management Practice Implementation. From 2007 – 2019, the PDTRA has utilized nearly \$4,000,000 in funding to implement a variety of watershed management activities through the use of competitive and non-competitive grant funding from State and Federal sources. Moving forward with the Comprehensive Watershed Management Plan and Targeted Implementation schedule, the PDTRA will be the primary entity for plan execution and fiscal responsibilities.

6.2.1 Joint Powers Board

Purpose: Approve work plans, amendments, fiscal reporting, annual assessments, review recommendations and provide direction to the Technical Advisory Committee.

The Pomme de Terre River Joint Powers Board includes of one elected official from each County Board of Commissioners and Soil and Water Conservation District Supervisors from each District included within this agreement. The Joint Powers Board will operate under the approved By-laws and Joint Powers Agreement to carry out responsibilities listed within the Plan. The Joint Powers Board will meet monthly throughout the ten-year lifespan of the plan to discuss business of the Plan.

6.2.2 Technical Advisory Committee

Purpose: Provide technical input and assist in implementation of the Plan, identify collective funding, program, and partnership opportunities, review priorities, evaluate direction from the board, and make recommendations to the Joint Powers Board to consider regarding the targeting efforts within the work plan of future grants.

The Technical Advisory Committee is comprised of one representative of each Soil and Water Conservation District and County included in the Pomme de Terre River Watershed. Each member of the committee shall be a member of each respective unit of government and shall be appointed by the respective unit of government. The Technical Advisory Committee also invites other partnering State and Federal Agencies including, but not limited to, MN Pollution Control Agency (MPCA), Board of Water and Soil Resources (BWSR), US Department of Natural Resources (DNR), US Fish and Wildlife Service(USFWS), Natural Resources Conservation Service (NRCS), MN Department of Agriculture (MDA) to serve as non-voting members. The Technical Advisory Committee will meet monthly throughout the ten-year lifespan of the Plan to discuss implementation activities of the Plan.

6.2.3 Share Services / Fiscal / Administrative Agent

Implementation: Members of the Pomme de Terre Technical Advisory Committee leverage education, watershed planning, monitoring, and implementation opportunities through collaboration and use of shared-services. Shared services between Soil and Water Conservation Districts are accomplished through a Contract for Service which has been used and signed between members of the Pomme de Terre River Association at the execution of any collaborative grant funding. These contracts are signed by each entity outlining required time tracking and project completion packets in order to receive reimbursement for staff time and cost-share.

It is the expectation that federal and state agency planning partners provide in-kind staff assistance to carry out the implementation activities identified within this Plan and not only provide or oversee program funds. These shared and coordinated services among federal and state agency staff, while not required to be identified within this Plan, will be discussed throughout the ten-year life of the Plan by the Technical Advisory Committee and are considered critical to meeting the goals of the Plan.

Administration: Administrative services shall be provided under the direction and control of the Joint Powers Board. These services shall include, but are not limited to, financial, legal and general administration. The Board may enter into contract and/or agreements with one or more of its member entities as a host entity or fiscal agent to carry out the functions of the Pomme de Terre River Association. As of 2019, the contracted Fiscal Agent for the Pomme de Terre River Association is the Stevens County Soil and Water Conservation District.

Coordination: The Pomme de Terre River Association has employed a Project Coordinator to assist the Joint Powers Board in carrying out its duties and responsibilities since 2007. It is expected that the Pomme de Terre River Association will continue the employment of a Coordinator to aid in carrying out the implementation plan so long as funding and program opportunities exist. Currently, the Stevens Soil and Water Conservation District holds a Host Entity Contract with the Pomme de Terre River Association to allow day-to-day operations. Duties of the Coordinator include, but are not limited to, applying for grant opportunities on behalf of the Pomme de Terre River Association, providing staff time for educational and outreach opportunities, aiding in program development, coordinating collaboration between the Planning Partners, and reporting measurable progress to the Board of Water and Soil Resources.

6.3 COLLABORATION WITH OTHER UNITS OF GOVERNMENT

The Pomme de Terre River Association will continue coordination and cooperation with other governmental units at all levels. Agencies including MN Pollution Control Agency (MPCA), Board of Water and Soil Resources (BWSR), Department of Natural Resources (DNR), US Fish and Wildlife Service (USFWS), MN Department of Agriculture (MDA), MN Department of Health (MDH), and Farm Service Agency (FSA) have provided input on the planning process through comment letters and participation in the Technical Advisory Committee. They are important resources in watershed management in providing program funding, technical assistance, and project opportunity. Cooperation between the Pomme de Terre River Association and Local units of government such as municipalities, township boards, county boards, and drainage authorities are also important to achieving plan goals. Partnerships may take various forms, including but not limited to, providing matching funds or in-kind services for grant applications, sharing of staff or other resources, and collaborating on project administration and implementation.

The Pomme de Terre River Association and existing partners will also continue to collaborate and identify emerging partners throughout the lifespan of the Plan when it is appropriate.

6.3.1 Collaboration with Non-Governmental Organizations

Plan partners expect to continue and build on existing collaboration with others when opportunities exist that align with plan objectives, including non-governmental organizations, while implementing this plan. Current and potential future partnerships include, but are not limited to the Minnesota Land Trust, Pheasants Forever, Ducks Unlimited, University of Minnesota Extension, local sporting groups, local service clubs, lake associations, Corn Growers, Soybean Growers, Farm Bureau, Farmers Union, and others.

6.4 FUNDING

Local, state, and federal sources of funding were evaluated for each implementation activity by the Planning Partners. The Planning Partners also expect to pursue grant opportunities collaboratively to fund implementation of the Targeted Implementation Schedule. Dependent upon individual project partners, other sources of funding may be evaluated as well.

Cost within the Targeted Implementation Schedule are estimates based on past and current capacity, program availability, and limiting factors such as staff time. Numbers can be expected to increase and decrease over the lifetime of the Plan's opportunities arise and program availability changes. It is expected that BWSR will allow for some flexibility to allow for unforeseen changes. The amount of funding provided by State, Federal and local sources for implementation of the Comprehensive Watershed Management Plan will have a significant impact on the Plan success.

6.4.1 Local Funding

Local funds for County offices and Soil and Water Conservation Districts can be derived from a variety of sources, including tax levies, fees, services and in-kind services, or local organizations. Local funding can be used to accomplish regional initiatives and goals where state and federal funds are unavailable or lacking. Local funding will be used as match for other utilized State and Federal grants.

Members of the Pomme de Terre River Association may provide direct funding as they may determine from time to time. In addition to, or in lieu of financial support, the members may also contribute services, personnel, or personal property to the Pomme de Terre River Association in such amounts as the members may determine from time to time in order to accomplish plan goals. Members are not expected to make any individual contribution unless it is approved by all members of the Joint Powers Board.

The total estimate of local funds needed for implementation over the 10-year timeframe of the plan is \$2,715,172. Note that most implementation activities include some type of local contribution, but local funds may not always represent the majority of funding for a given activity.

6.4.2 State Funding

State funding includes all funds derived from existing block grants, regulatory programs or base cost share grants and program implementation. State funding excludes general operating funds obtained from BWSR, counties, service fees, and grants or partnership agreements with the federal government or other conservation organizations.

The total estimate of state funds needed for implementation over the 10-year timeframe of the plan is \$23,259,244.

6.4.3 Federal Funding

Federal funding includes programs such as, but not limited to, the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Conservation Stewardship Program (CSP), and Federal Section 319 competitive grants provided through the

Environmental Protection Agency. The Pomme de Terre River Association has a past record of utilizing such funding to leverage state dollars used to provide technical assistance and project development as well as for project implementation cost-share. The Pomme de Terre River Association will continue to pursue federal dollars where the purpose of an initiative described in plan aligns with the goals of various federal agencies and programs.

The total estimate of federal funds needed for implementation over the 10-year timeframe of the plan is \$38,787,508.

6.4.4 Collaborative Grants

The Pomme de Terre River Association has a rich history of collaboratively applying to competitive and non-competitive grants (including Clean Water Funds, Federal Section 319, Surface Water Assessment Grant, and Watershed Restoration and Protection Strategy Implementation) in order to achieve watershed-wide objectives and will continue to do so as opportunities that align with plan objectives present themselves.

6.4.5 Other Funding Sources

Non-governmental funding sources exist that provide technical assistance and fiscal resources to implement projects whose objectives align with the goals of the Pomme de Terre River Association. Though the Pomme de Terre River Association has not historically contracted services directly with non-governmental organization, it is important to recognize the impact other conservation organizations have on the overall goals of the watershed and the potential that this plan could be used to explore future opportunities for partnerships.

Private sector companies, including agribusinesses, are often overlooked as a potential source of implementation funding. Many agribusiness companies are working to improve water quality, others provide technical or financial support for implementing management and structural water quality BMPs. Most often this is through Field to Market: The Alliance for Sustainable Agriculture. This Plan could be used to explore private sector funding, especially when the estimated water quality benefits have monetary value.



6.5 WORK PLANNING

The Pomme de Terre River Association annual budgeting process and will include budget projections, staff capacity, project prioritization, and scheduling details. The Joint Powers Board will develop and approve the work plans under advisement of the Technical Advisory Committee. Individual district budgets and workplans may include priorities included within the Comprehensive Watershed Management Plan annual workplan.

Each work plan will be based on progress made toward goals and new initiatives aimed at either maintaining or accelerating progress in targeted sub-watersheds. Staff and financial resource availability will be considered. Feedback and guidance received will be integrated into the work plan. The work plan will include an indication of each local government’s responsibilities for implementing the Plan. The responsibilities of each local government will be adopted and implemented separately by each local government but under advisement and direction of the Plan Partners.

After Plan adoption, the Planning Partners’ annual work plans will be developed or revised to include implementation activities identified in this Plan. When feasible, the activities will be coordinated with other agency plans, projects, and timelines.

6.5.1 Project Selection within Targeted Implementation Areas

Implementation of best management practices is based on staff capacity to perform outreach to willing landowners. The Planning Partners identified the feasible number of landowners they could contact over the 10-year timeframe of the Plan. Pollutant reductions from the top ranked practices by cost benefit was used to modify the 10-year measurable goals of the Plan.

During the annual work planning process, top ranked practices identified through tools outlined in Table 6-1 will be reviewed in the field by local staff to determine feasibility.

Table 6-1. Targeting Tools by Project Type

Project Type	Targeting Methodology	
	Priority Area Scale	Field Scale
Shoreline/streambank restorations	GIS Terrain Analysis	Shoreline inventories (Implementation Activity) DNR Erosion Sites surveys
Septic system improvements	Septic system inspections	
Wetland restorations	PTMApp to help identify specific locations for BMPs.	Results from PTMApp will be reviewed by local staff to verify site-specific feasibility.
Non-structural BMPs	Urban BMPS – WRAPS Priority Management Zones	
Structural BMPs		

Local staff will use their best professional judgment and PTMApp regarding the potential for project implementation within PTMApp or locally identified parcels, and contact landowners to discuss specific project implementation opportunities.

Locations of septic system improvements will be based on septic inspections conducted by county

staff or licensed private inspectors within the targeted implementation areas (Poor Quality Lakes and High Quality Lakes). The total number of septic system upgrades will be based on compliance and inspection reports.

Pollutant reductions achieved from implementation of practices within the targeted implementation areas will be completed annually using the measuring tools listed in Table 6-2.

Table 6-2. Measuring Tools by Project Type

Project Type	Measuring Tool	
	Priority Area Scale	Field Scale
Shoreline/streambank restorations	BWSR Water Erosion Pollution Reduction Estimator	
Septic system improvements	University of Minnesota Estimator for individual Subsurface Sewage Treatment Systems (Phosphorus reductions from an expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household by County from the 2010 Census, and an average of 1.95 pounds of phosphorus produced per person per year.)	
Wetland restorations	The cumulative pollutant and flow reduction of all projects within a Priority Area will be based on inputting implemented practices in the existing Hydrological Simulation Program - Fortran - Scenario Application Manager (HSPF-SAM) model. This will be completed by the Planning Partners in partnership with MPCA.	The pollutant reduction of each individual project will be based on PTMApp reduction assumptions.
Non-structural BMPs		
Structural BMPs		

6.5.2 Funding Request

Funds are currently used for activities that restore or protect natural resources in the watershed, including board and staff leadership, project identification, outreach, reporting, budgeting, and technical support. The counties utilize general funding to support work related to shoreland, Subsurface Sewage Treatment Systems (SSTS), stormwater, wetland, feedlots and other local ordinances. Natural Resource Block Grant (NRBG) funds are used by counties and Soil and Water Conservation Districts for local water plan implementation, administrative duties, and the Wetland Conservation Act (WCA). Existing grants fund technical assistance and financial incentives for erosion control and other natural resource projects on private property.

Additional work and staffing time will be supported through successful grant awards from, but not limited to: MPCA, BWSR, DNR, MDH, and USDA. The Planning Partners will consider Clean Water Fund dollars as a major funding source for this Plan. In order to ensure competitiveness within this funding pool, the Plan Partners will ensure that their proposed project aligns with high-level state priorities, key implementation items, and non-point funding priority criteria prior to submitting a grant application.

6.6 ASSESSMENT, EVALUATION AND REPORTING

Assessment and evaluation of the implementation activities within the Plan are critical in tracking progress. Progress reports for various funding sources will provide a record of project performance

and how funds were utilized. Progress reporting will also occur through the Board of Soil and Water Resources eLINK system. County monitoring and enforcement records will provide progress reports on implementation activities involving Subsurface Sewage Treatment Systems, well sealing, and land use ordinance changes. A system for tracking and reporting activities internally and at the local level will be developed as State grant opportunities to implement the Plan become available.

6.6.1 Annual Evaluation

The purpose of the annual evaluation will be to assess progress towards each of the Plans stated goals. The Joint Powers Board will also review plan progress and give feedback that will help set the upcoming year’s priorities. Members of the Technical Advisory Committee will provide their individual and representative Boards with annual updates on the progress of the plan’s implementation in accordance with Board of Soil and Water Resources. Additional evaluation will occur through separate annual planning documents of each participating local government unit.

In addition, the Pomme de Terre Watershed will have completed a Cycle II Watershed Restoration and Protection Strategy (WRAPS) that will include an updated listing of impaired waters, biological stressors, and Total Maximum Daily Loads (TMDL). It is important the Pomme de Terre River Association evaluates the TMDL and WRAPS information (estimated for completion in 2020/21). Adjustments can be made prior to the five-year evaluation if the changes necessary.

Table 6-3. MPCA WRAPS Cycle II Schedule for the Pomme de Terre River Watershed

WRAPS Cycle II Schedule				
2017	2018	2019	2020	2021
Team & Partner Planning				
Biological Monitoring (Fish and Bugs)				
Stream and Lake Monitoring (Chemistry)				
Geomorphology, Hydrology monitoring				
HSPF model update				
	Assess data			
	Stressor ID of bio impairments			
		TMDLs		
		WRAPS		

6.6.2 Partnership Assessment

The structure of the partnership is expected to continue as it has since 1981 and will adhere to the standing Pomme de Terre River Association By-Laws and Joint Powers Agreement. Changes to the partnership structure will be handled through By-Law and Joint Powers Amendments and rely on the voting power of the Joint Powers Board.

Partnerships (State and Federal agencies) will be assessed to determine if increased collaboration is necessary to complete plan goals.

6.6.3 Five Year Evaluation

The Technical Advisory Committee and Joint Powers Board will conduct a five year plan evaluation using information from previous annual evaluations. The five year evaluation will

enable the Committees and the Planning Partners to assess whether any new information needs to be included to improve plan prioritization, targeting, and measurability. The Joint Powers Board will formally recommend amendments and an updated plan to the Board of Water and Soil Resources for final approval and adoption.

6.6.4 Reporting

Annual reporting requirements for the Board of Soil and Water Resources will be administered per the BWSR Grant Administration Manual. Funding administration requirements are:

- Annual eLINK grant reporting, including NRBG and competitive grants
- Annual website reporting with current project details
- Financial Statements including combined balance sheet, income statement, budgetary comparison statement, notes to the financial statement, and management’s discussion and analysis.

Reporting on collaborative grant funding will be completed by Pomme de Terre River Association staff. All other reporting for funding (local, state, or federal) utilized directly through the individual offices will be reported on by respective entities.

6.7 PLAN AMENDMENT PROCESS

6.7.1 Plan Amendment Process

This plan extends through December 31, 2030. Revision of the plan may be needed through an amendment prior to the plan update if significant changes emerge in the priorities, goals, policies, administrative procedures, or plan implementation programs. Revision may also be needed if issues emerge that are not addressed in the plan.

All amendments to this plan will follow the procedures set forth in this section. This plan will remain in full effect until a revision is approved by BWSR. Plan amendments may be proposed by any agency, person, or local government to the Technical Advisory Committee. Proposals must be reviewed by the Technical Advisory Committee before it is recommended to the Joint Powers Board. The Joint Powers Board must then review and approve initiation of the amendment process. All recommended plan amendments must be submitted to the Technical Advisory Committee along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost to complete the amendment.

Preparers of this plan recognize it may need to be periodically amended to remain useful as a long-term planning tool. However, the structure and intent of this plan is to provide flexibility to respond to short-term emerging issues and opportunities. The Technical Advisory Committee will review and revise its long-range work plan and/or implementation programs through the annual budget and annual work plan.

Technical information (especially water quality data) will require frequent updating, such as when new, site-specific data is generated by state, federal, and regional agencies, counties, cities, or individuals. Generally, these technical updates and studies are considered part of the normal course of operations consistent with the intent of this plan and not a trigger for a

plan amendment. However, when the technical information results in a policy that is a significant change of direction from the plan or the implementation of a projects or implementation programs, a plan amendment may be required.

6.7.1.1 Criteria and Format for an Amendment

Plan participants recognize the large work effort required to manage water-related issues. The plan provides the framework to implement this work by identifying priority issues, measurable goals, and action items.

Examples of situations where a plan amendment may be required include the following:

- Addition of a capital improvement project that is not described by the plan
- Addition of new programs or other initiatives that have the potential to create significant financial impacts or controversy when inconsistent with the issues, goals, and policies

Plan amendment criteria includes the following:

- Any Local Government Unit (LGU) can propose an amendment.
- Costs are covered by the LGU who proposes the amendment unless the Joint Powers Board decides to split costs out because there is mutual benefit among multiple partners.
- The Technical Advisory Committee will review proposals and recommend proposal to the Joint Powers Board who will make final approval to move forward with amendment through a resolution with a majority vote.
- The Pomme de Terre River Association holds the hearing.
- Majority vote of the Joint Powers Board to submit plan to BWSR for review and approval – doesn’t need prior approval by each individual LGU If the Technical Advisory Committee , Joint Powers Board or BWSR decides that a plan amendment is needed, the Pomme de Terre River Association will follow a process similar to the County plan amendment processes:

Step 1: Consult— The Technical Advisory Committee and Joint Powers Board consults with the BWSR Board Conservationist to review the water plan amendment process. Determine the extent of the amendment and review process and the correlated level of effort needed. Extensive amendments typically take 18 months to complete. Set a due date for amendment completion and work backward to develop an internal timeline. Discuss the participants who will be involved with the amendment review and the level of involvement, which depends on the nature of the amendment.

Step 2: Self-Assessment and Develop Proposed Amendment— The Technical Advisory Committee and the Joint Powers Board perform self-assessment to evaluate progress on current plan. This should include a review of Performance Review and Assistance Program (PRAP) reports and other related information. The Technical Advisory Committee and Joint Powers Board review current plan sections and develop a list of sections to amend, noting

areas where information is missing or out of date. Review state reports/plans for the area where the amendment is proposed, such as Groundwater Restoration and Protection Strategies (GRAPS) and Watershed Restoration and Protections Strategies (WRAPS), for possible inclusion into the plan. The BWSR website contains information on how to use the WRAPS reports in water plans. At the discretion of the Joint Powers Board, drafts of proposed plan amendments may be sent to all plan review authorities for input before beginning the formal review process.

Step 3: Submit Petition— The Technical Advisory Committee will recommend that a petition be made to BWSR that the Joint Powers Board must then approve prior to submission. The petition to amend the Comprehensive Watershed Management Plan can be in the form of a letter or memo to the BWSR Board Conservationist. The petition may be submitted electronically. The petition should contain background on the Comprehensive Watershed Management Plan, the purpose(s) for the amendment, and a general summary of the amendment (areas of the plan that will be amended and scope of the amendment if known). The petition should include the proposed amendment, the date of the public hearing, and a copy of the signed resolution passed by the Joint Powers Board indicating the intent to amend the Comprehensive Watershed Management Plan. The Resolution to Amend template is located on the BWSR website. BWSR Board Conservationist consults with the BWSR Regional Manager, other BWSR staff, and board members and provides feedback to the Joint Powers Board regarding the petition and proposed amendment.

Step 4: Notify—The Joint Powers Board will maintain a distribution list for copies of the plan and, within 30 days of adopting an amendment, distribute copies of the amendment to the distribution list. Generally, electronic copies of the amendment will be provided or documents made available for public access on the Pomme de Terre River Association website (<http://www.pdtriver.org>). Printed copies will be made available upon written request and printed at the cost of the requester.

