# POMME DE TERRE RIVER

## Comprehensive Watershed Management Plan


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

**Cover Image:** Pomme de Terre River. Photo Credit: MPCA

BWSR

Emmons & Olivier Resources, Inc.

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## ACKNOWLEDGEMENTS

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## ACRONYMS

| | |
|---|---|
| BMP | Best Management Practice |
| BWSR | Board of Water and Soil Resources |
| CWMP | Comprehensive Watershed Management Plan |
| DWSMA | Drinking Water Supply Management Area |
| *E. coli* | *Escherichia coli* |
| 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 |
| 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 |
| 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.

**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.

**Nitrate** – A negatively charged compound ($NO_3^-$) 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.

**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 Soil & Water Conservation District
- Douglas Soil & Water Conservation District
- Grant Soil & Water Conservation District
- West Otter Tail Soil & Water Conservation District
- Stevens Soil & Water Conservation District
- Swift 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.

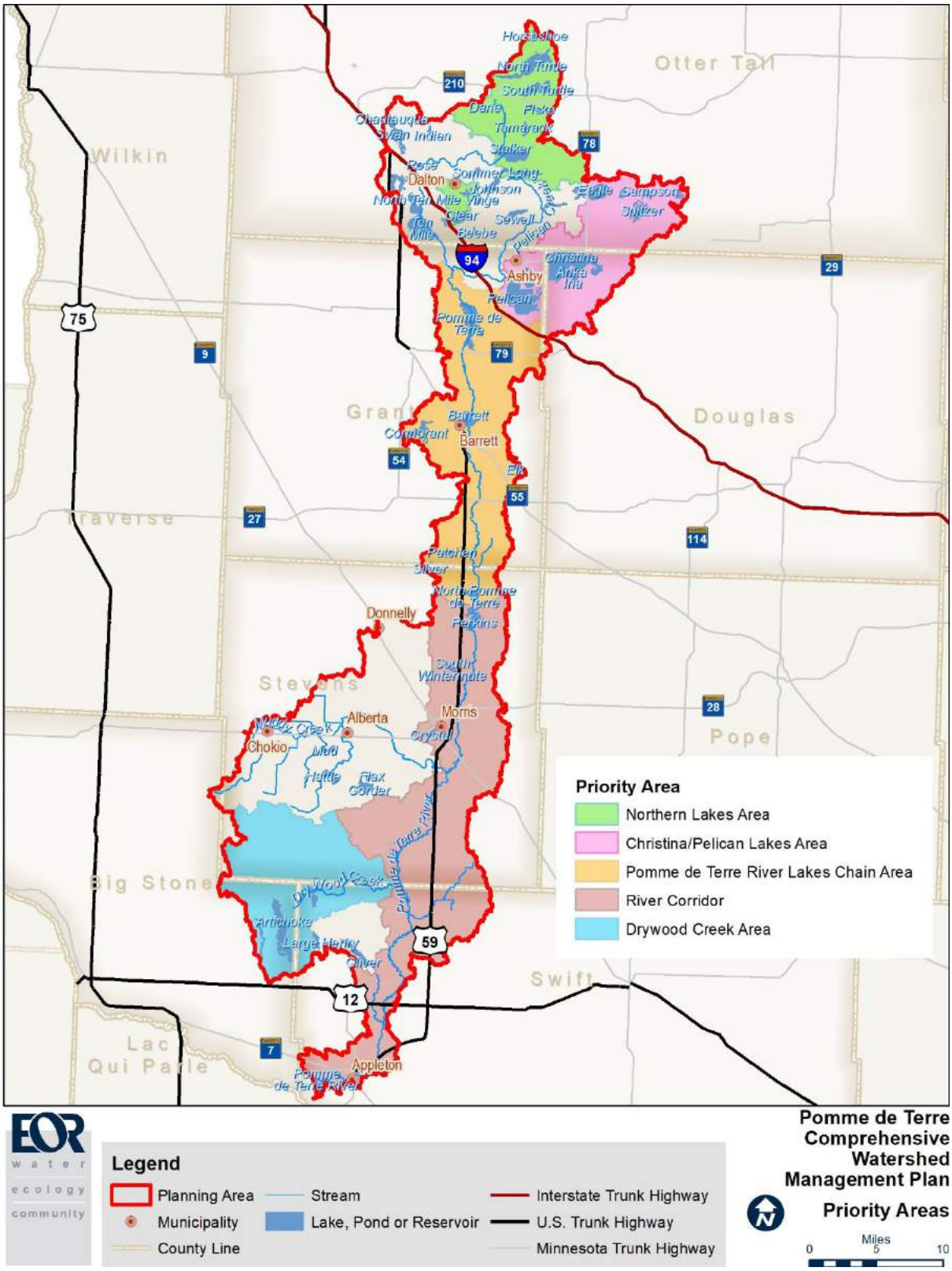



**Figure 1-1.** Pomme de Terre River Planning Area and Priority Areas

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.

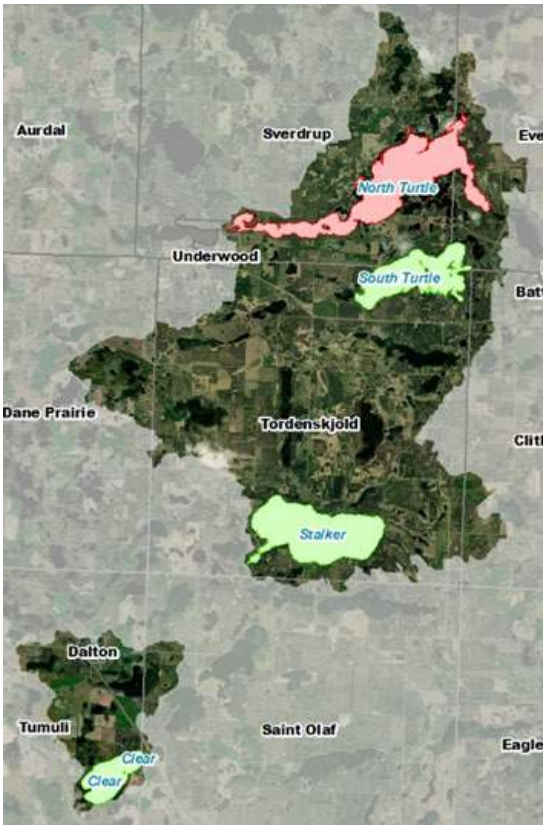
*Pomme de Terre Reservoir - Morris*

# 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 to improve water use; request County Geologic Atlas to fill data gaps; continue well monitoring. | Promote and encourage the adoption of irrigation management BMPs | |
| | | Request County Geologic Atlas | |
| | | Identify recharge areas from Atlas | |
| | | Continue ongoing observation well monitoring | |
| **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 | Increase perennial vegetation | |
| | | Restore wetlands | |
| | | Create and develop spatial database for tracking projects | |
| | | Implement structural agricultural BMPs | |
| | | Implement nonstructural BMPs | |
| **Altered Hydrology** Section 3.2.1 | No increase in runoff from public water basins during peak run-off periods | Identify non-contributing areas | |
| | | Pursue management plans for existing and future controlled outlets on public water basins | |
| **Aquatic Invasive Species** Section 3.5.1 | 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 | |
| | | Attend DNR District-led meetings | |
| | | Continue implementing education programs | |
| | | Work with local law enforcement agencies on inspections | |
| **Watershed Outreach** Section 3.6.1 | Facilitate strategic networking, learning, and participation of targeted groups to assess, build, and leverage community capacity | Establish and facilitate Networking/Advisory Groups for targeted groups | |
| | | Establish soil health teams for Northern and Southern Regions with 2 meetings per year | |
| | | Regional tours on prioritized portions of the watershed to facilitate partnerships, highlight improvements, and discuss areas | |
| **Watershed Outreach** Section 3.6.1 | Increase adoption of BMPs by increasing engagement and communication with residents, local landowners and agricultural producers | BMP-focused demonstrations/workshops | |
| | | Soil health field days | |
| | | Continue work initiated by the WRAPS Cycle II; identify target audience for BMP adoption through follow-up interview | |
| **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 | 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 | |
| | | Create and host consistent orientation to all types of newly elected local officials | |
| **Watershed Outreach** Section 3.6.1 | Encourage soil and water stewardship and awareness across all generations | Work with UMN Extension to host watershed education event | |
| | | 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

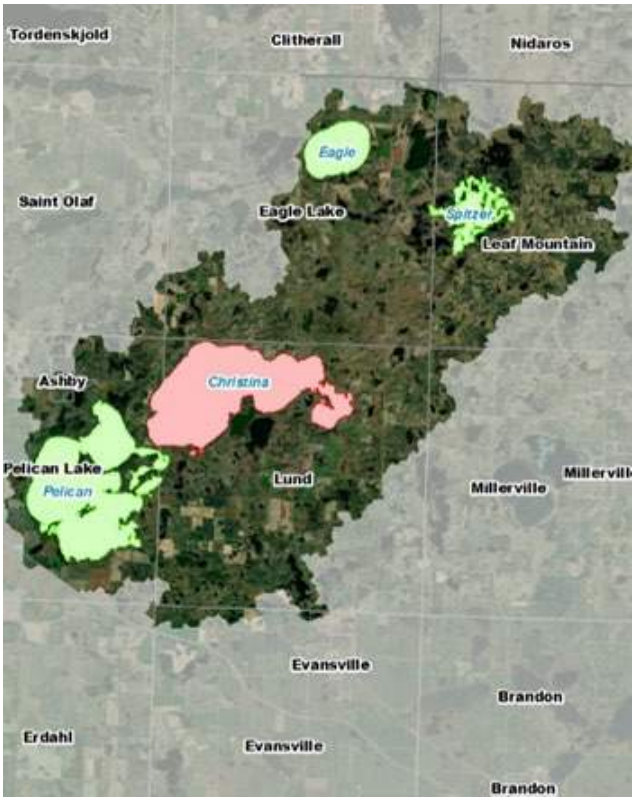
# Northern Lakes Area (Otter Tail County)




**Status Key:**
➔ - No Change
↗ - Improving Progress
↙ - Slowed or Declining Progress
✓ - Activity Completed

| 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 | |
| | | Implement nonstructural 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) | 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 | |

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

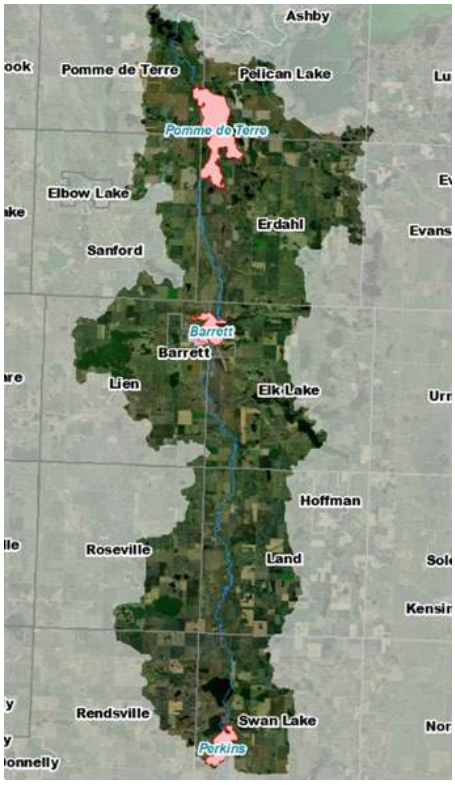



Priority High Quality Lake
Priority Poor Quality Lake
Townships

**Status Key:**
➔ - No Change
↗ - Improving Progress
↙ - Slowed or Declining Progress
✓ - Activity Completed

| 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 High Quality Lake
Priority Poor Quality Lake
Townships

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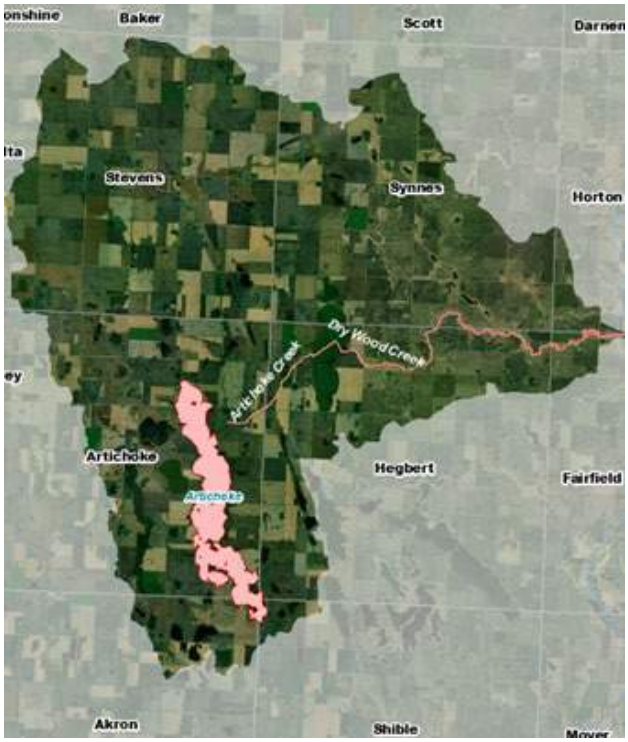
| Priority | Goal | Implementation Activities | Status |
|---|---|---|---|
| **Drinking Water Protection** Section 3.1.1 | Protect public drinking water supplies with moderate and high vulnerability (Barrett) | Convert cropland to perennial vegetation | |
| | | Review wellhead protection plans and serve 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 | |
| | | 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 | |

# Pomme de Terre River Corridor (Stevens & Swift County)


**Status Key:**
➔ - No Change
↗ - Improving Progress
↙ - Slowed or Declining Progress
✓ - Activity Completed

| 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 | |
| | | Implement ag. pit closures | |
| **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 Impaired Stream
Priority Poor Quality Lake
Townships

**Status Key:**
➔ - No Change
↗ - Improving Progress
↙ - Slowed or Declining Progress
✓ - Activity Completed

| 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 | |
| | | Implement nonstructural 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 | 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 | |
| | | Implement ag. pit closures | |
| **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 | |

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 |
|---|---|
| **Pomme de Terre River Association Joint Powers Board** | - Adopting the Plan<br>- Implementation of the Plan<br>- Amending the Plan<br>- Allocating funding sources<br>- Approving work plans<br>- Approving contractual agreements<br>- Approving fiscal reports and budgets<br>- Approving reports required by grantors<br>- Approve grant applications and accept grant funds<br>- Approve assessment on plan progress and measurable results<br>- Establish committees |
| **Pomme de Terre River Association Staff** | - Prepare work plan<br>- Prepare fiscal reports and budgets<br>- Prepare reports required by grantors<br>- Prepare and submit grant applications<br>- Complete assessment on plan progress and measure results<br>- Provide general administrative and fiscal functions |
| **Technical Advisory Committee** | - Provide expertise and scientific data<br>- Develop recommendations for Plan Implementation<br>- Assist with work plan development and implementation<br>- Identify and coordinate grant opportunities<br>- Assist with assessment on plan progress and measure results<br>- Provide recommendations to the PdTRA JPB |
| **Individual County Boards and Soil and Water Conservation Districts** | - Approving the Plan prior for submittal to the Board of Water and Soil Resources<br>- Local Adoption of the Plan<br>- 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".*

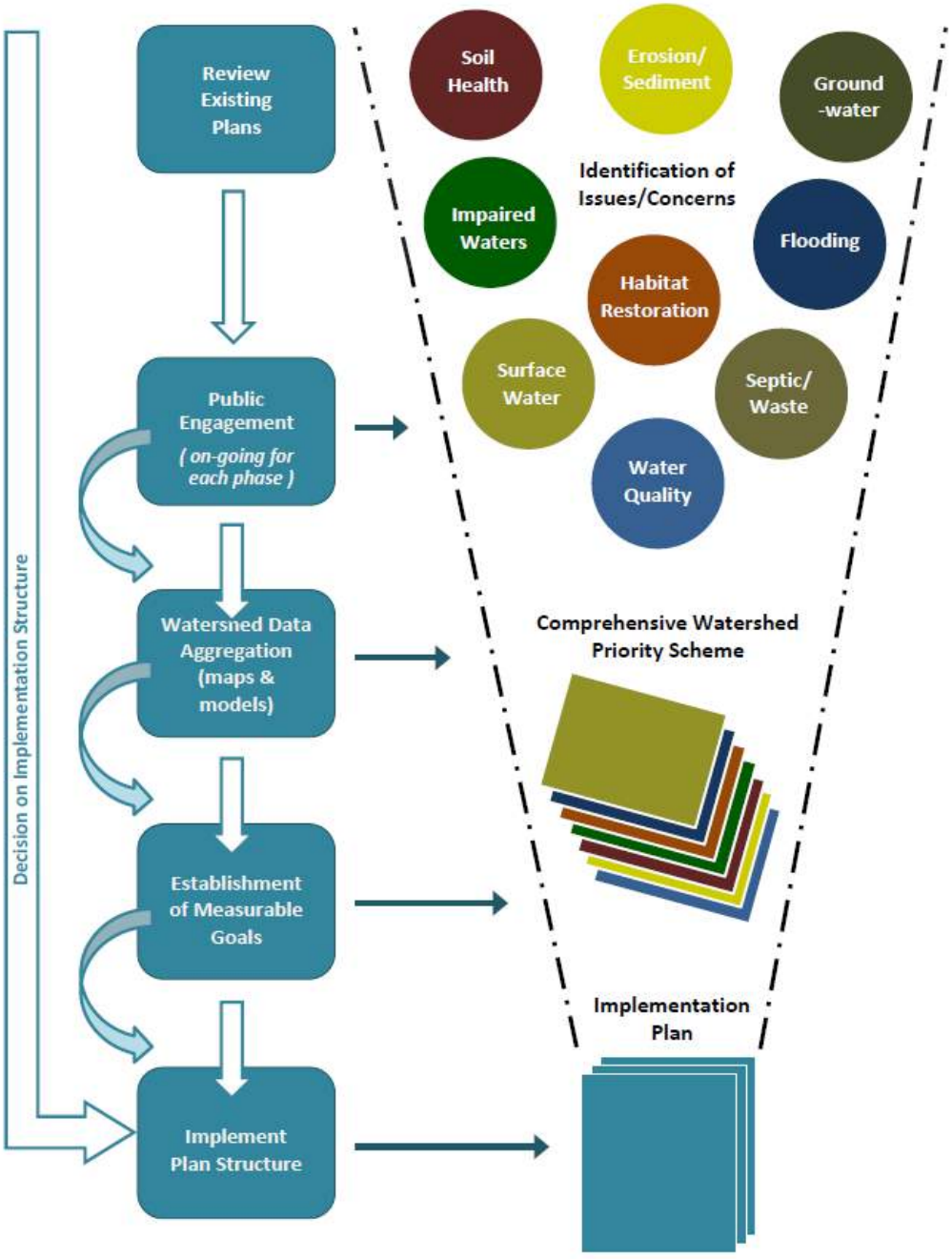



**Figure 2-1.** Schematic of the Comprehensive Watershed Management Planning Process

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 Advisory Committee attended an organized Bus Tour of the watershed where members presented watershed concerns, issues and existing conservation practices. Members of the Citizen 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.

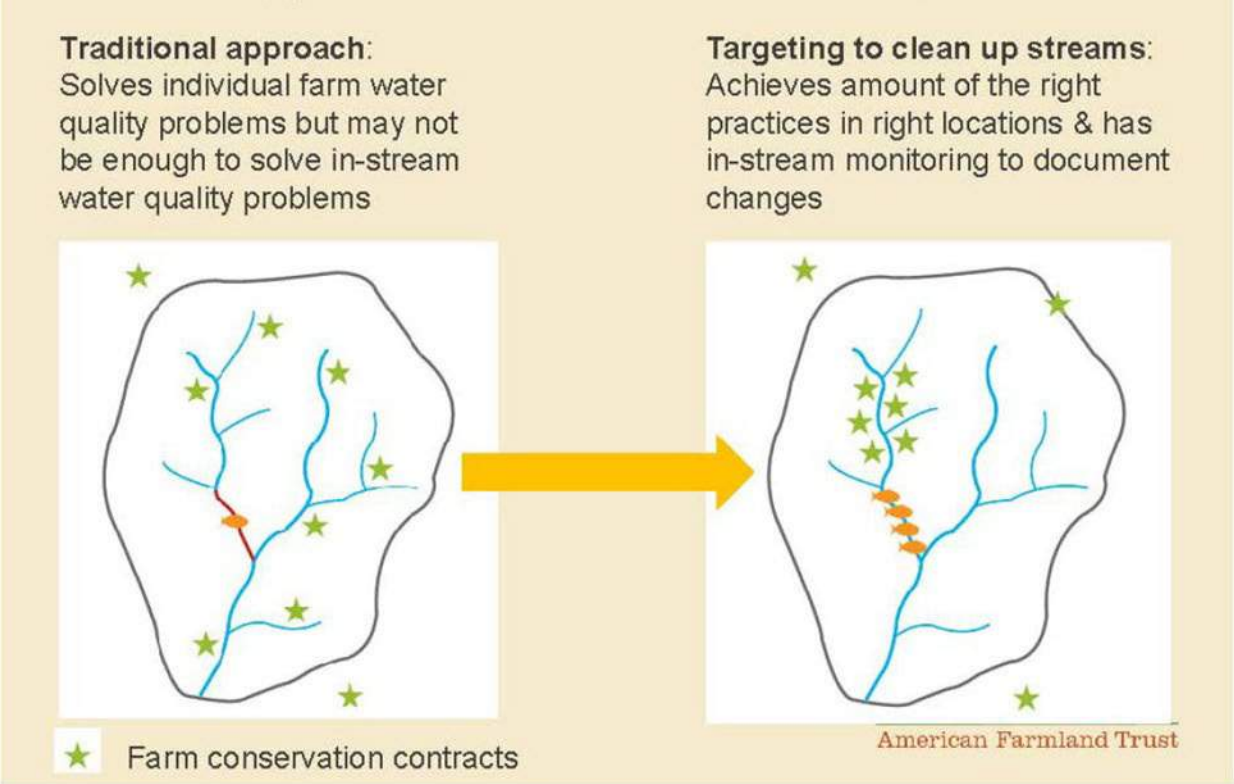



**Figure 2-2.** Best management practice targeting illustration to achieve measurable reductions in water quality

## 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 by the Planning Partners 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 (see Appendix C). Overlaying 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 (see red dots in Figure 2-3), and therefore achieves multiple benefits.

The Planning Partners agreed upon a multiple lines of evidence approach for using model outputs and prioritization tools as each model or tool used individually has strengths and weaknesses. For example, HSPF watershed pollutant loading models identify areas of greatest runoff and pollutant yields, while the Zonation conservation prioritization software identifies areas of local value, rare and natural features, groundwater sensitivities, pollutant risk, conservation priorities, and other wildlife and habitat concerns.

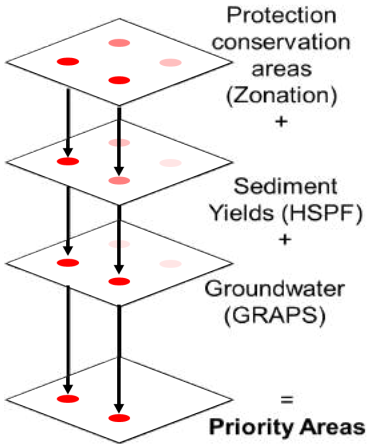



**Figure 2-3.** Priority Area Identification Process in the Comprehensive Watershed Priority Scheme

As a result, no single model or tool was used exclusively in the planning process, but rather they were used collectively to guide the prioritization and targeting process. The criteria from these models and tools that were used to identify priority areas are listed and described 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.

The Comprehensive Watershed Priority Model was reviewed by the Advisory Committee in a series of Water Conversations where participants were asked to identify high priority areas/resources based on the criteria listed in Table 2-1; recognizing that these were the areas where high priority issues/concerns should be addressed first.

Five key areas were identified through the Comprehensive Watershed Priority Model that have a concentration of restoration and protection priorities (Figure 2-4 and Figure 2-5).

- **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**: Selected for the high 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:** Selected for the high pollutant loads the Pomme de Terre River discharges to downstream waters, and the locally important riparian habitat and floodplain connections along the Pomme de Terre River Corridor. The priority area for the river corridor encompasses the adjacent subwatersheds (HUC-12's) but the Planning Partners recognize that the contributing drainage area is where the work needs to take place to address excess pollutants. The 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. 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.

The Planning Partners also identified a number of issues that require action on a watershed-wide scale, including altered hydrology, groundwater conservation, drinking water protection, aquatic invasive species, and watershed education. For example, altered hydrology impacts occur across the watershed and land use practices need to be implemented across the watershed.

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

| Comprehensive Watershed Priority Model Feature | Resource | Criteria for Identifying Priority Areas |
|---|---|---|
| **Impaired or fully supporting lakes and streams that have been assessed** | 2013 Pomme de Terre River Watershed Restoration and Protection Strategies (WRAPS) report Aquatic Life Use and Recreation Use assessment maps | Lake eutrophication impairments, stream aquatic life impairments, and fully supporting lakes and streams. |
| **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 identified through the 2013 WRAPS civic engagement process. |
| **Nearly or barely impaired lakes**<br>**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 lakes and streams with declining long-term trends in water quality |
| **Conservation Priority Areas** | 2017 Pomme de Terre River Zonation Tool | Areas with a concentration of lakes of biological significance, existing perennial cover and shallow basins, groundwater contamination susceptibility, and riparian areas. 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 (HSPF) watershed pollutant loading model (1995-2009) | HSPF estimates the 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. Subwatersheds with higher sediment and phosphorus pollutant yields or higher water yield (runoff). |
| **Locations of existing BMPs** | County and Soil and Water Conservation District data | Locations of existing BMPs (Water and sediment control basins, rain gardens, alternative tile intakes, etc.) compiled by the Pomme de Terre River Association and SWCDs. |
| **Locations of existing easements** | County and Soil and Water Conservation District data | Locations of existing easements, such as Wildlife Production Areas, Scientific & Natural Areas, Prairie Bank, Nature Conservancy, Reinvest In Minnesota, Wildlife Management Areas, etc. |
| **Drinking water and groundwater pollution sensitivity** | Minnesota Department of Health | Pollution sensitive near surface materials, wells with high pollution sensitivity, and drinking water supply management areas with moderate to high susceptibility. |

## 2.3 DRAFT ISSUES STATEMENT & MEASURABLE GOALS

At the end of the issues identification and prioritization process, the Planning Committee developed draft issue statements to describe the problems that will be addressed in the Plan. The draft issue statements were refined based on feedback from the Policy Committee. Next, the Planning Committee identified long-term and 10-year measurable goals for each issue. 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, suite of models tools, and studies were used to identify goals and the level of implementation needed to achieve those goals, summarized in Table 2-2 below. Note that every model operates at a different scale and is applicable in different situations, and as a result the outputs of different models likely do not always agree.

**Table 2-2.** Models, tools, and studies used to develop measurable goals for each issue

| Plan Section | Issue | Applicable Model, Tool, or Study |
|---|---|---|
| **3.1.1** | **Drinking Water** | Minnesota Department of Health provided groundwater data layers that were used to support prioritization and development of goals related to groundwater in the Planning Area. The Pomme de Terre Groundwater Restoration and Protection Strategy report was not available during the planning process. |
| **3.1.2** | **Groundwater Conservation** | |
| **3.2.1** | **Altered Hydrology** | BWSR representative presented to the Planning Committee on October 3, 2018 about the main concepts of Altered Hydrology and provided input on the type of measurable goals that could potentially be set for the Pomme de Terre Watershed in terms of storage (as required for the Comprehensive Watershed Management Plan). Discussed the potential to use HSPF to find a baseline annual runoff to help find potential storage goals. |
| **3.3.1** | **Poor Quality Lakes** | MPCA staff provided BATHTUB modeling results for the impaired lakes that estimated the total annual phosphorus load to each lake (from surface runoff, internal loading, and atmospheric deposition) and the annual phosphorus load reduction needed for those lakes to meet state water quality standards. These models formed the basis for the poor quality lake long-term goals. Total Maximum Daily Load studies were available for North Turtle, Christina and Pelicans lakes at the time of Plan development. |
| **3.3.2** | **High Quality Lakes** | Goals were derived from Table 5 of the Houston Engineering 2018 Targeted Implementation Plan for the Pomme de Terre River Watershed to Improve Surface Water Quality Final Report. From Section 5.2 of this report:<br>Eutrophication protection goals established by the several Minnesota State Agencies, known as the Lakes of Phosphorus Sensitivity Significance (June 14, 2016; see https://gisdata.mn.gov/dataset/env-lakes-phosphorus-sensitivity) have been developed for a subset of lakes across Minnesota. The purpose of these goals is to protect lakes which currently meet water quality standards from future water quality degradation.<br>The Lakes of Phosphorus Sensitivity Significance protection goal consists of using an empirical (regression) relationship, where the independent variables are the long-term (existing 10-year) average in-lake total phosphorus (TP) concentration, the lake volume, and the hydraulic inflow rate. The dependent variable is the estimated long- |

| | | |
|---|---|---|
| | | term TP load. The empirical equation is used to "back calculate" an existing load to the lake.<br>The protection goal for each lake is established as the 25th percentile TP concentration using the concentration data for the 10-year period. The annual load protection goal is then established by back calculating the load using the 25th percentile TP concentration, and further reducing the estimated annual TP load by 10%. Table 5 shows the protection goals for these lakes with the Pomme de Terre River watershed, based upon the Lakes of Phosphorus Sensitivity Significance. |
| **3.3.3** | **Protect and Restore Perennial Cover and Shallow Basins** | The Planning Partners provided an estimate of the number of expiring conservation program acres by County between 2020 and 2030. |
| **3.4.1** | **Excess Pollutants in Rivers & Streams** | MPCA staff used HSPF-SAM to determine 1996-2009 average annual base scenario TSS and TP loads for the Dry Wood Creek (HSPF subbasin A210) and the Pomme de Terre River Outlet (HSPF subbasin A10). Stream TP reductions were based on the reductions needed to achieve the stream TP standard of 0.15 mg/L based on the 1996-2009 average annual TP concentration for the Dry Wood Creek (HSPF subbasin A210; 0.32 mg/L) and the Pomme de Terre River Outlet (HSPF subbasin A10; 0.16 mg/L). |
| **3.4.2** | **Loss of In-stream Habitat** | During the planning process, DNR shared a desktop bank erosion inventory completed in 2018 that will serve as a baseline for the number of erosions sites. |

The Planning Partners formed six subcommittees to develop measurable goals and identify implementation activities for a set of related issues: Altered Hydrology, Groundwater, Water Quality, AIS and Shoreline, Education and Outreach, and In-Stream Habitat. These goals, including the rationale for each goal, are described in detail within Section 3. Implementation activities needed to achieve these goals are listed within each issue category in Section 3, with the schedule of implementation and cost estimates identified in the Targeted Implementation Schedule in Section 4.

## 2.4 TARGETING AREAS FOR IMPLEMENTATION WITHIN PRIORITY AREAS

The Planning Partners used several tools to target areas for implementation of practices within the priority areas, described in detail below and also listed in Table 6-1 in Section 6.5.1:

### 2.4.1 Groundwater conservation practices

Minnesota Department of Agriculture has developed maps of areas of vulnerable groundwater where nitrate can move easily through soil and into groundwater, contaminating drinking water sources. Agricultural practices that reduce nitrate should be targeted for implementation first in areas of vulnerable groundwater and in DWSMAs that have nitrate-nitrogen concentrations at or in excess of 5.4 mg/L nitrate-nitrogen. An interactive map of vulnerable groundwater can be accessed at: https://www.mda.state.mn.us/chemicals/fertilizers/nutrient-mgmt/nitrogenplan/mitigation/wrpr/wrprpart1/vulnerableareamap.

### 2.4.2 Wetland restoration areas

Wetland restoration sites were chosen as a subset of the state-wide Restorable Wetlands Inventory layer. Wetlands were selected based on a criteria of have a pool area greater than 0.25 acres and a pooled area/drainage area ratio between 0.5% and 2.0%, consistent with Agricultural Conservation Planning Framework/Iowa Conservation Reserve Enhancement Project (CREP) program criteria for siting wetlands. Wetland sites were ranked high to low based on PTMApp pollutant removal calculations for storage BMPs.

### 2.4.3 Structural and Nonstructural BMPs

The Prioritize, Target, and Measure Application (PTMApp) is a state-wide desktop and web application which can be used by practitioners to provide the technical bridge between the general description of the types of strategies in a local water plan and the identification of implementable on-the-ground Best Management Practices (BMPs) and Conservation Practices (CPs). PTMApp can be used in a workshop environment by Soil and Water Conservation Districts (SWCD), county local water planning, agency staff and decision-makers to interactively and in real-time, PRIORITIZE resources and the issues impacting them, TARGET specific fields to place CPs and BMPs, and MEASURE water quality improvement by tracking the expected nutrient and sediment load reductions delivered to priority resources. The tool enables practitioners to build prioritized and targeted implementation scenarios, measure the cost-effectiveness of the scenario for improving water quality, and report the results to pursue funds for project implementation. The PTMApp tool can be accessed at: https://ptmapp.bwsr.state.mn.us/.

Houston Engineering developed a targeted implementation plan for the Pomme de Terre River Watershed to improve surface water quality using PTMApp (Houston 2018). Houston reported that this Targeted Implementation Plan (i.e., Plan) identifies technically feasible locations for Best Management Practices and Conservation Practices (collectively referred to as Practices) on agricultural land, based on "best" (i.e., most cost effective) value. Non-structural practices include the use of conservation tillage, cover crops, conservation reserve program (CRP) and permanent vegetative cover. Structural practices are "constructed" and include farm ponds, grassed waterways, nutrient reduction wetlands, bio-reactors, and other common agricultural practices.

EOR applied the feasible practices identified in the Houston 2018 report to the Priority Areas of this Plan. EOR ranked all feasible practices within each Priority Area from the lowest cost-benefit ($ per pound of sediment reduced) to the highest cost-benefit. EOR selected the top ranked practices based on the total number of practices the Planning Partners determined were feasible to implement each year. The sum of the pollutant load reductions achieved from these top ranked practices was used to determine the 10-year measurable goals for the priority resources.


## 2.5 SUMMARY

The priority issues and resources were assigned specific goals and implementation activities to be completed within the 10-year timeframe of the plan. The Planning Partners identified long-term and 10-year measurable goals for each priority issue. These goals, including the rationale for each goal, are described in detail within 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. A schedule of implementation and cost estimates for all implementation efforts are provided in the Targeted Implementation Schedule in Section 4. 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.

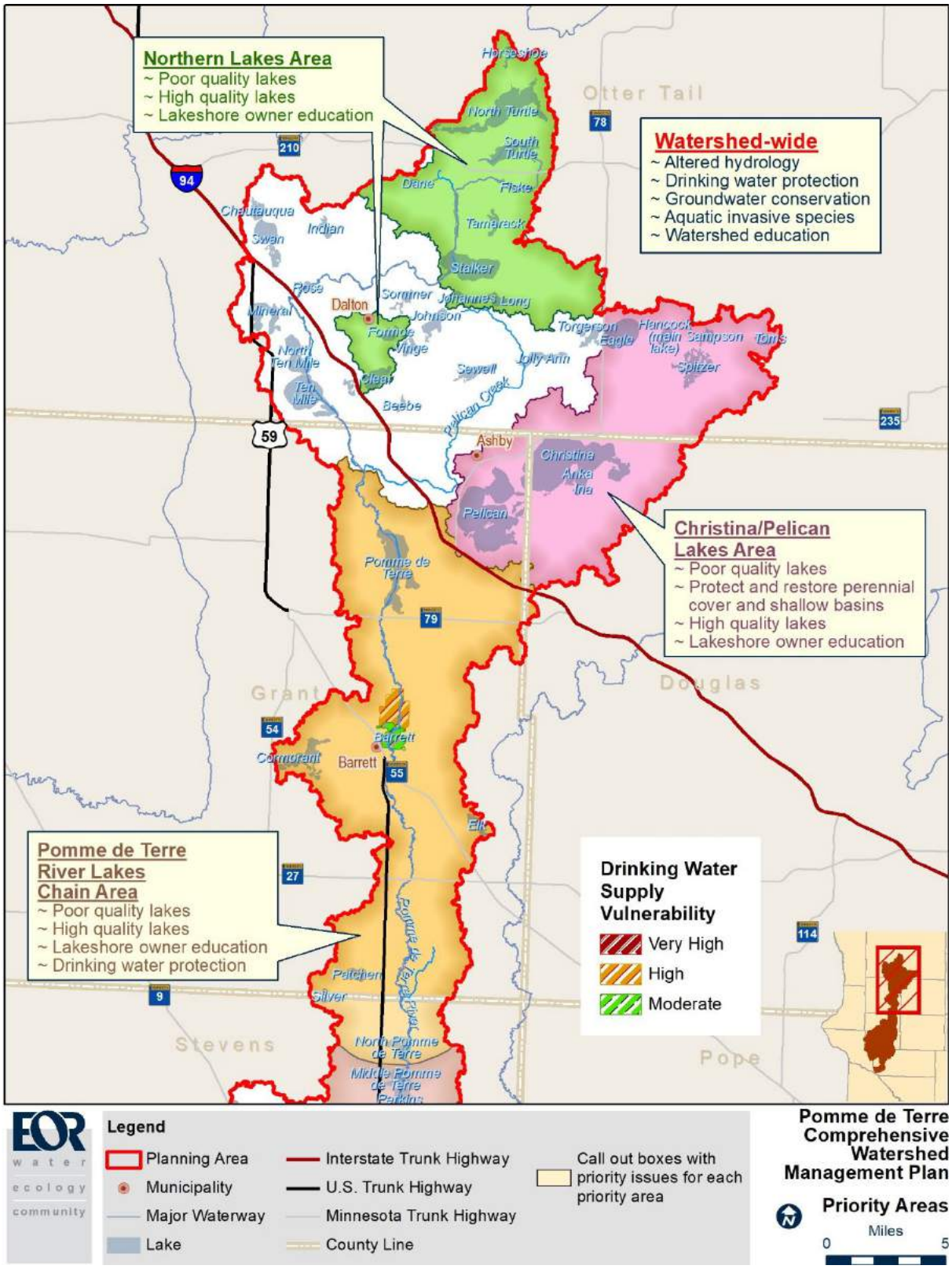



**Figure 2-4.** Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Northern Region)

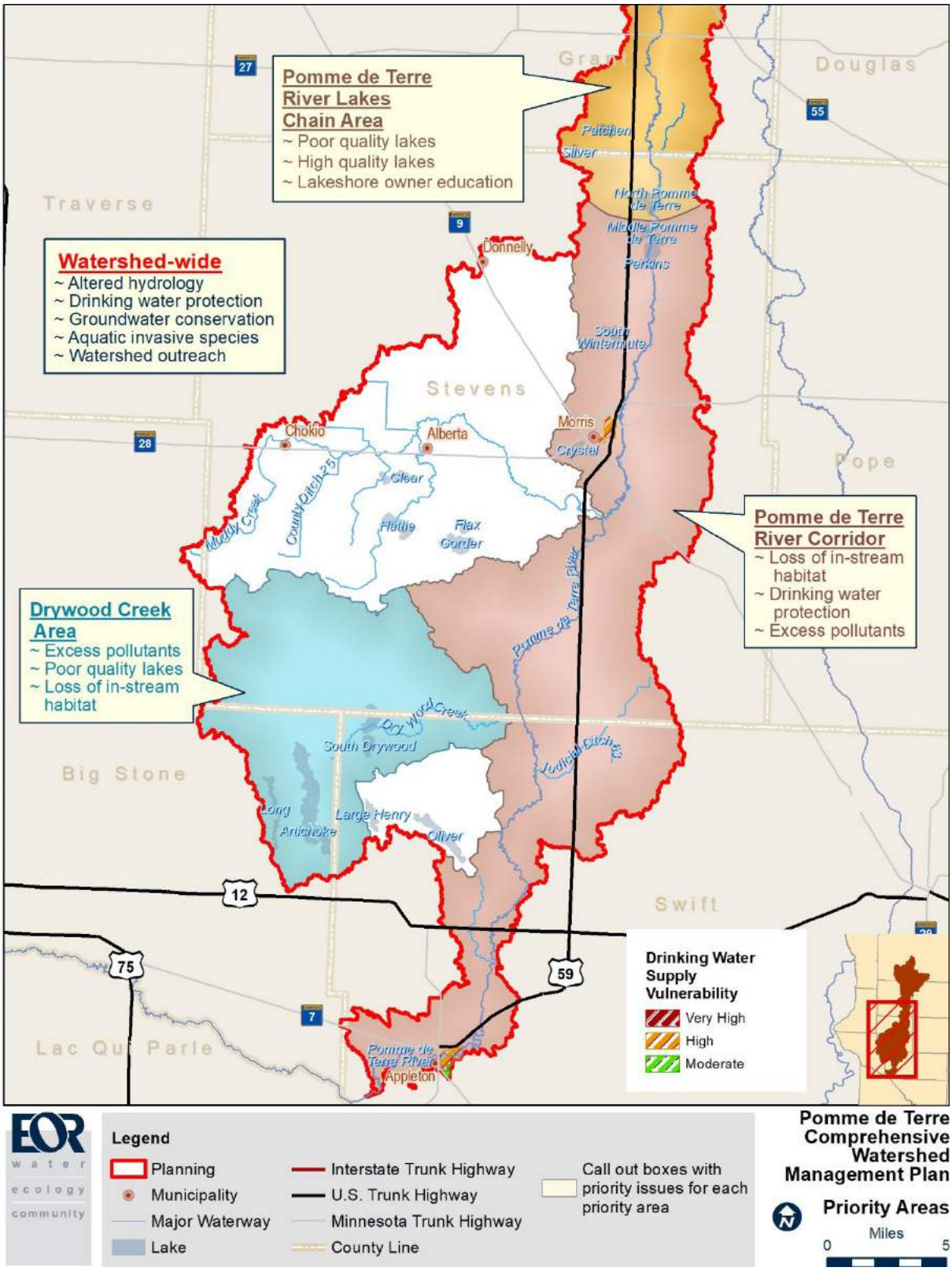



**Figure 2-5.** Pomme de Terre River Comprehensive Watershed Management Plan Priority Areas (Southern Region)

# 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 3 ppm or higher.

**Desired Future Condition (Long-Term Goal):**

Public and private wells have safe and adequate drinking water.

**10-Year Measurable Goals:**

**Goal 1:** Partner with the cities of Appleton, Morris, and Barrett to implement city wellhead protection plans and provide best management practice technical assistance to protect public drinking water supplies with moderate and high vulnerability.

**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.

There are very few agricultural landowners in the DWSMAs, with a total of just 175 acres of land currently used for agriculture in the DWSMAs. Therefore, other land uses will be targeted for BMPs.

### Targeted Implementation Activities:

A. Implementation of 5-10 BMPs within DWSMAs over the 10 year period (*note that these practices overlap with BMPs identified under Altered Hydrology; see Table 3-3*).

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.

C. Contact landowners about completing BMP projects within Drinking Water Supply Management Areas that reduce nitrate leaching/runoff, such as nutrient management plans, buffers and WASCOBs.

D. Host annual well water nitrate testing clinics (at least one per year in each county), coordinate with environmental labs to have nitrate and arsenic testing kits available to the public, and inform the public of test availability via newspaper, social media, radio, or other methods.

E. 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 |
|---|---|
| BMP Implementation in DWSMAs | Track the number BMPs implemented 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 | Number of participants in cost-share program to seal wells |

### 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 (mainly located in the Pomme de Terre River Corridor), five golf course irrigation 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. Additionally, work will continue on irrigation-related BMPs in the Pomme de Terre River Corridor to reduce water demand.* 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. Irrigation BMPs will be addressed primarily within the Pomme de Terre River Corridor.

**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; all counties will request the County Geologic Atlas to fill groundwater monitoring data gaps, and continue 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. Agricultural irrigation wells will be targeted because the number of ag wells is significantly higher than all other irrigation wells in the watershed combined.

**Targeted Implementation Activities:**

A. Contact 50% of the 185 landowners with agricultural irrigation wells to promote and encourage the adoption of irrigation water management BMPs that increase water conservation and decrease conditions for nitrogen loss (BMPs such as irrigation scheduling, conversion to low flow nozzles, using online tools to identify best irrigation

timing, and testing irrigation water for nitrate) using the MDA vulnerable groundwater area map (see Table 6-1).

B. Counties will request the County Geologic Atlas if they have not already done so (Douglas, Grant, Otter Tail, and Swift Counties have already requested) including staff time to locate wells to support atlas development.

C. Identify recharge/vulnerable areas identified from the hydrogeologic section of the County Geologic Atlas (Section B) and once those areas are identified then focus BMPs/conservation efforts in those areas.

D. Continue ongoing observation well monitoring efforts on the 19 DNR wells in the Pomme de Terre Watershed.

**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 |
| County Geologic Atlas | Number of counties with the development of Geologic Atlas in progress |
| BMPs on recharge/vulnerable areas | Recharge and vulnerable areas identified & number of landowners contacted |
| 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 1.5 inch over the entire watershed.

**10-Year Measurable Goals:**

**Goal 1**: Reduce annual runoff volume by 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 10-year 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. Structural practices don't have direct impact on reducing annual runoff but they do increase infiltration by temporarily storing water and allowing some sediment to settle within the field rather than immediately discharge into a water course or water body. The benefits of reducing peak runoff are legitimate, even though structural practices don't drastically increase water storage.

An HSPF scenario was run by MPCA based on implementing 2,920 wetland restoration acres and 9,340 acres of Source Reduction BMPs (63% of Source Reduction acres are converted to perennial grasses and 37% of those acres adopt cover crops) from the PTMApp Targeted Implementation Plan (Houston 2018). The average annual volume reduction from the Baseline model for 1996-2016 was 3,527 ac-ft/yr.

HSPF default settings current do not assign volume reductions for structural BMPs. The user can set the flow "efficiency" for a structural BMP. The flow efficiency is the percent by which the flow will be reduced due to implementation of the BMP. In the case of a WASCOB, for example, the user may choose to set the flow efficiency to 0.025 to represent evapotranspiration/water storage resulting in a flow reduction of 2.5%. The 10-year goal is currently based on implementing only wetland restoration acres and nonstructural practices, but implementation of structural practices is still important for achieving the long-term goal and will be tracked as part of the Altered Hydrology goal. Volume reductions achieved from the implementation of structural practices will be determined using future versions of HSPF-SAM that include scientifically based flow reductions for structural practices.

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).

The Planning Partners will implement conservation practices that will assist with the watershed's climate resilience, by sequestering carbon and decreasing fertilizer impacts on the environment. Such conservation practices include cover crops, conservation tillage, buffer strips, and other soil health practices.

**Targeted Implementation Activities:**

A. Implement 20,840 acres of perennial vegetation over 10 years including the use of state and federal conservation programs.
B. Complete 2,920 acres of wetland restoration over 10 years, inclusive of 2,720 acres that will be targeted within *Protect and Restore Perennial Cover and Shallow Basins* and *Streams – Excess Pollutants* priority areas (see Table 3-3).
C. Implement 581 structural agricultural best management practices (BMPs; farm ponds, grassed waterways, nutrient reduction wetlands, bio-reactors, and other common agricultural practices) over 10 years from the Pomme de Terre River PTMApp Targeted Implementation Plan (Houston 2018) and best professional judgment inclusive of 383 practices that will be targeted within *Poor Quality Lakes, High Quality Lakes* and *Streams – Excess Pollutants* priority areas (see Table 3-3).
D. Implement 9,340 acres of nonstructural BMPs (conservation tillage, cover crops, conservation reserve program (CRP) and permanent vegetative cover) over 10 years from the Pomme de Terre River PTMApp Targeted Implementation Plan (Houston 2018) and best professional judgment inclusive of 7,370 acres that will be targeted within *Poor Quality Lakes, High Quality Lakes* and *Streams – Excess Pollutants* priority areas (see Table 3-3).
E. Identify previously completed functioning BMPs and create spatial database, develop database for tracking projects and making decisions in the future (at the five year evaluation).
F. Identify public water basins that do not flow to the Pomme de Terre River and may exceed the ordinary high water level.
G. Pursue management plans for 100% of 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.

**Table 3-3.** Altered Hydrology implementation by Priority Issue

| Priority Issue | Priority Area | Perennial vegetation (acres) | Non-structural Practices (acres) | Structural Practices (number) | Wetland restoration area (acres) |
|---|---|---|---|---|---|
| 3.2.1: Watershed-wide | Watershed-wide | 20,840 | 1,970 | 198 | 200 |
| 3.3.1: Poor Quality Lakes | Pomme de Terre, Barrett, Perkins, Christina, Artichoke, and North Turtle | | 3,640 | 113 | |
| 3.3.2: High Quality Lakes | Pelican, Clear, Elk, Spitzer, Stalker, South Turtle, and Eagle | | 1,150 | 82 | |

| | | | | | |
|---|---|---|---|---|---|
| 3.3.3: Protect and Restore Perennial Cover and Shallow Basins | Christina-Pelican Lakes Area | 3850 | | | 150 |
| 3.4.1: Streams – Excess Pollutants | Drywood Creek Area and Pomme de Terre River Corridor | | 2,580 | 188 | 20 |
| **Total** | | **24,690** | **9,340** | **581** | **370** |

**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 3-4.

**Table 3-4.** Pace-of-Progress Measures for Altered Hydrology

| Type of Project | Measure for Pace-of-Progress | Estimated Outcomes |
|---|---|---|
| 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 ac-ft/yr |
| Wetland Restoration | Track acreage and storage volume provided in acre-feet | |
| 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 | 581 structural practices |
| Management Plans for controlled outlets | Track the number of plans developed | Management plans for 100% of proposed controlled outlets |

* HSPF default settings current do not assign any volume reductions for structural BMPs. The user can set the flow "efficiency" for a structural BMP. The flow efficiency is the percent by which the flow will be reduced due to implementation of the BMP. In the case of a WASCOB, for example, the user may choose to set the flow efficiency to 0.025 to represent evapotranspiration/water storage resulting in a flow reduction of 2.5%. Volume reductions achieved from the implementation of structural practices will be determined using future versions of HSPF-SAM that include scientifically based flow reductions for structural practices.

## 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 threatened by or impaired for eutrophication that will be addressed first include: Artichoke, Barrett, Perkins, Pomme de Terre, Christina, and North Turtle. Lakes will be addressed in order of least amount of total phosphorus over the state standard: Pomme de Terre, Barrett, Perkins, Christina, North Turtle, Artichoke.

**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 3-5). Lake fish and aquatic plant communities that meet aquatic life use standards.

**Table 3-5.** 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 |
| **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 3-7).

**Table 3-6.** Poor Quality Lakes Long-term Goals: What we ultimately need to achieve

| Poor Quality Lake | PTMApp Existing Watershed Phosphorus Load (includes surface runoff only) [lb/yr][1] | Long-Term Phosphorus Load Goal: | |
|---|---|---|---|
| | | Total Load Reductions Needed to Meet WQ Standard [% of total load][2,4] | Estimated PTMApp Reductions (includes surface runoff only) [lb/yr] |
| **Artichoke[3]** | 1,713 | 34% | 576 |
| **Barrett[3]** | 1,485 | 38% | 561 |
| **North Turtle** | 606 | 21% | 126 |
| **Perkins** | 1,777 | 29% | 519 |
| **Pomme de Terre[3]** | 762 | 10% | 79 |
| **Christina** | 437 | 31% | 135 |

*Footnotes:*

1. *PTMApp data from Houston 2018*
2. *MPCA data provided by Paul Wymar based on MPCA lake BATHTUB modeling (May 2, 2019 email)*
3. *Note that a TMDL study has not been completed for Artichoke, Barrett or Pomme de Terre lakes*
4. *Total load includes surface runoff, atmospheric, and internal loading*

**Table 3-7.** Poor Quality Lakes 10-year Goals: What we can get done in the next 10 years

| Poor Quality Lake | PTMApp Structural Practices | | PTMApp Nonstructural Practices | | Septic system improvements | | Shoreline restorations | | Total 10-year TP Load Reduction Goal [lb/yr] |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Practices [#] | Estimated TP Load Reduction [lb/yr] | PTMApp Practice Area [acres] | Estimated TP Load Reduction [lb/yr] | Number of Practices [#] | Estimated TP Load Reduction [lb/yr] | Shoreline Restoration Area [square ft] | Estimated TP Load Reduction [lb/yr] | |
| **Artichoke** | 7 | 6.4 | 650 | 89.9 | 2 | 1.9 | 5,000 | 0.4 | 99 |
| **Barrett** | 8 | 7.3 | 530 | 73.0 | 16 | 16.8 | 12,500 | 1.0 | 98 |
| **North Turtle** | 16 | 13.4 | 250 | 34.8 | 5 | 5.2 | 40,000 | 3.3 | 57 |
| **Perkins** | 56 | 52.7 | 1,520 | 209.6 | 10 | 11.6 | 12,500 | 1.0 | 275 |
| **Pomme de Terre** | 12 | 13.7 | 540 | 74.4 | 49 | 50.2 | 37,500 | 3.2 | 142 |
| **Christina** | 14 | 17.3 | 150 | 20.9 | 20 | 20.2 | 10,000 | 0.8 | 59 |

*Data Sources:*

- *The number of practices implemented are based on locally determined achievable levels of*

*implementation over the next 10-years*

- *Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.*
- *Estimated TP Load Reductions from septic system improvements are based on the expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household area-weighted to the fraction of each county in the drainage area and the county-specific persons per resident from the 2010 Census (which varies from 2.16 in Big Stone to 2.58 in Stevens), and an average of 1.95 pounds of phosphorus produced per person per year.*
- *Estimated TP Load Reductions from shoreline restorations are based on the 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.*

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

### Justification for Goals:

Long-term goals are based on lake BATHTUB modeling work completed by MPCA staff. 10-year measurable goals are based on what level of implementation is achievable for County and SWCD staff. Reaching out and finding landowners to voluntarily install BMPs on their land is the biggest challenge and the limiting factor for implementation.

### Targeted Implementation Activities:

A. Conduct an average of 950 hours of Subsurface Sewage Treatment Systems inspections per year.

B. Update 102 septic systems found noncompliant through Subsurface Sewage Treatment Systems inspections.

C. Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process. Work has already begun on North Turtle. In 2022, inventories will be done on Pomme de Terre and Barrett. In 2028, inventories will be done on Christina, Artichoke, and Perkins.

D. Implement 47 shoreline restoration projects for erosion control based on shoreline inventories.

E. 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; see Table 3-3).

F. 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; see Table 3-3).

G. Lake outreach process. Series of meetings to identify possible in-lake management and engage affected landowners in lake water quality management.

**Pace of Progress:**

Table 3-7 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.

- The number of practices implemented are based on locally determined achievable levels of implementation over the next 10-years
- Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.
- Estimated TP Load Reductions from septic system improvements are based on the expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household area-weighted to the fraction of each county in the drainage area and the county-specific persons per resident from the 2010 Census (which varies from 2.16 in Big Stone to 2.58 in Stevens), and an average of 1.95 pounds of phosphorus produced per person per year.
- Estimated TP Load Reductions from shoreline restorations are based on the 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.

### 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. Lakes will be addressed in order of how close they are to being impaired: Pelican, Clear, Elk, Spitzer, Stalker, South Turtle, and Eagle.

**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 3-8).

**Table 3-8.** 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) |
| **North Central Hardwood Forests Lake Standard** | | **< 40** | **> 1.4** |
| **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 |

## 10-Year Measurable Goals:

**Goal 1:** *Achieve* lake-specific phosphorus reduction in direct drainage runoff to: Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes based on current project feasibility (Table 3-9).

**Table 3-9.** High Quality Lakes Long-term Goals: What we ultimately need to achieve

| High Quality Lake | PTMApp Existing Watershed Phosphorus Load (includes surface runoff only) [lb/yr][1] | Long-Term Phosphorus Load Goal:[2] | |
|---|---|---|---|
| | | Load Reduction [% of load] | Estimated PTMApp Reductions (includes surface runoff only) [lb/yr][3] |
| **Clear** | 456 | 12% | 55 |
| **Eagle** | 116 | 12% | 14 |
| **Elk** | 143 | 12% | 17 |
| **Pelican** | 1,257 | 12% | 151 |
| **South Turtle** | 281 | 12% | 34 |
| **Spitzer** | 80 | 12% | 10 |
| **Stalker** | 1,358 | 12% | 163 |

*Footnotes:*

1. *PTMApp data from Houston 2018*
2. *Long-term goal was based on the 2014 Minnesota Nutrient Reduction Strategy phosphorus reduction*
3. *Load Reductions were calculated as a 12% reduction of the PTMApp Existing Watershed Phosphorus Load (lb/yr)*

**Table 3-10.** High Quality Lakes 10-year Goals: What we can get done in the next 10 years

| High Quality Lake | PTMApp Structural Practices | | PTMApp Nonstructural Practices | | Septic System Improvements | | Shoreline Restorations | | Total 10-year Load Reduction Goal [lb/yr] |
|---|---|---|---|---|---|---|---|---|---|
| | 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 | 126 |
| **Eagle** | 1 | 0.2 | 70 | 9.2 | 4 | 4.3 | 7,500 | 0.6 | 14 |
| **Elk** | 1 | 0.4 | 0 | 0 | 3 | 3.3 | 0 | 0.04 | 4 |
| **Pelican** | 1 | 0.5 | 0 | 0 | 27 | 27.7 | 5,000 | 0.4 | 29 |
| **South Turtle** | 4 | 1.5 | 80 | 10.4 | 10 | 11.0 | 20,000 | 1.6 | 25 |
| **Spitzer** | 0 | 0 | 30 | 4.7 | 75 | 77.9 | 150,000 | 12.2 | 95 |
| **Stalker** | 71 | 58.2 | 490 | 67.9 | 7 | 7.5 | 15,000 | 1.2 | 135 |

*Data Sources:*

- *The number of practices implemented are based on locally determined achievable levels of implementation over the next 10-years*
- *Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.*
- *Estimated TP Load Reductions from septic system improvements are based on the expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household area-weighted to the fraction of each county in the drainage area and the county-specific persons per resident from the 2010 Census (which varies from 2.16 in Big Stone to 2.58 in Stevens), and an average of 1.95 pounds of phosphorus produced per person per year.*
- *Estimated TP Load Reductions from shoreline restorations are based on the 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.*

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

### Justification for Goals:

Long-term goals are based on Lakes of Phosphorus Sensitivity modeling work completed by DNR. The average target annual TP reduction needed to protect existing water quality in the High Quality Lakes from the MN DNR Lakes of Phosphorus Sensitivity modeling work reported in Table 5 of Houston 2018 Targeted Implementation Plan was 10%. To simplify the phosphorus reduction goals in this Plan, the long-term goals for High Quality Lakes were set equal to the 2014 Minnesota Reduction Strategy phosphorus reduction goal of 12%. In addition, the Houston 2018 Targeted Implementation Plan PTMApp scenarios for the Pomme de Terre River Watershed were based on the 2014 Minnesota Reduction Strategy phosphorus reduction goal of 12%.

The 10-year measurable goals are based on what level of implementation is achievable for County and SWCD staff. Identifying landowners willing to install Best Management Practices on their land is challenging and a limiting factor for implementation. Where the long-term goal is exceeded based on the locally determined level of implementation over the next 10-years (e.g., Clear and Spitzer Lakes), resources will be reallocated to lakes where the long-term goal is not yet achieved (e.g., Elk and Pelican). The Planning Partners will re-assess progress towards the lake goals annually and determine if and where resources need to be re-allocated. There are a lot of unknown factors in determining load reductions; the 10-year goals are intended to represent the total level of implementation possible across all lake drainage areas and will be adjusted annually based on actual implementation achieved for each lake.

**Targeted Implementation Activities:**

A. Conduct an average of 280 hours of Subsurface Sewage Treatment Systems inspections per year.

B. Update 130 septic systems found noncompliant through Subsurface Sewage Treatment Systems inspections.

C. Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process. In 2022, inventories will be completed on South Turtle, Clear, and Spitzer. In 2028, inventories will be completed on Pelican, Eagle and Stalker.

D. Implement 82 shoreline restoration projects for erosion control based on shoreline inventories.

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; see Table 3-3).

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; see Table 3-3).

**Pace of Progress:**

Table 3-10 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.

- The number of practices implemented are based on locally determined achievable levels of implementation over the next 10-years
- Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.
- Estimated TP Load Reductions from septic system improvements are based on the expected number of septic systems to be updated from noncompliant to compliant over the next ten years, the average number of persons per household area-weighted to the fraction of each county in the drainage area and the county-specific persons per resident from the 2010

Census (which varies from 2.16 in Big Stone to 2.58 in Stevens), and an average of 1.95 pounds of phosphorus produced per person per year.

- Estimated TP Load Reductions from shoreline restorations are based on the 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.

### 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:** Maintain 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 that are currently enrolled in conservation programs and set to expire before 2030 (3,564 acres). The goal is based on the number of expiring

conservation program acres, which are at risk for conversion. Based on the 2016 NLCD, there are 3,617 acres of wetland and 7,337 acres of grassland in the Christina-Pelican Lakes Priority Area.

**Targeted Implementation Activities:**

A. Maintain a total of 3,600 acres of wetlands and grassland in various conservation cover programs and enroll 400 new acres of perennial vegetation (note that these practices overlap with BMPs identified under Altered Hydrology; see Table 3-3).

**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.

- Estimated TP Load Reductions for new acres of enrolled wetlands and grasslands in various conservation cover programs were modeled as wetland restorations using the PTMApp tool for a similarly sized storage BMP. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.

*Lake Christina Overlook*

## 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, with less significant sources from 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 HSPF modeled reductions needed to reduce average annual total phosphorus concentrations from 1996-2019 to the river eutrophication standard of 150 µg/L. The long-term sediment reductions needed will be based on the 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 in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (Table 3-12).

**Goal 2:** Achieve set resource-specific sediment reduction goals based on current project feasibility in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (Table 3-12).

**Goal 3:** Reduce stormwater runoff impacts by 21 lbs/yr of phosphorus and 5 tons/yr of sediment in cities and work with the cities of Appleton and Morris to develop stormwater management plans.

**Table 3-11.** Drywood Creek and the Pomme de Terre River Corridor Long-term Goals: What we ultimately need to achieve

| | HSPF 1996-2009 Average Annual Load[1] | Long-term Load Reduction Needed to Meet Water Quality Standards (% total load) | Long-term Load Reduction Needed to Meet Water Quality Standards[4] |
|---|---|---|---|
| **Sediment (ton/yr)[2]** | | | |
| **Drywood Creek** | 1,064 | 73% | 777 |
| **Pomme de Terre River** | 21,286 | 53% | 11,281 |
| **Phosphorus (lb/yr)[3]** | | | |
| **Drywood Creek** | 21,717 | 52% | 11,384 |
| **Pomme de Terre River** | 105,655 | 7% | 7,396 |

*Footnotes:*

1. *Existing Annual Loads are based on HSPF 1996-2009 Average Annual Loads.*
2. *Sediment reduction goals are based on existing TMDL studies (73% for Drywood Creek, 2015 Pomme de Terre River Watershed TMDL Report; 53% for the Lower Pomme de Terre River, 2010 Turbidity TMDL for the Pomme de Terre River).*
3. *Phosphorus reduction goals are based on HSPF modeling results to reduce 1996-2019 stream total phosphorus concentrations to the river eutrophication standard of 150 µg/L, communication from Paul Wymar (MPCA).*
4. *Long-term load reductions are based on applying the reduction goal as a percent to the existing load.*

**Table 3-12.** Drywood Creek and the Pomme de Terre River Corridor 10-year Goals: What we can get done in the next 10 years

| Drainage Area: Activity | Total Number | Phosphorus (lb/yr) | Sediment (tons/yr) |
|---|---|---|---|
| **Drywood Creek HUC 10** | | | |
| PTMApp Structural Practices | 38 practices | 44 | 241 |
| PTMApp Nonstructural Practices | 1,180 treated acres | 163 | 750 |
| Wetland restorations | 10 acres | 2 | 38 |
| Pit closures | 2 closures | 390 | N/A |
| **10-year goal** | | **599** | **1,029** |
| **Long-term goal** | | **263** | 18,032 |
| **Pomme de Terre River Corridor** | | | |
| PTMApp Structural Practices | 150 practices | 176 | 1,006 |
| PTMApp Nonstructural Practices | 1,400 treated acres | 194 | 1,250 |
| Wetland restorations | 10 acres | 12 | 245 |
| Pit closures | 2 closures | 390 | N/A |
| Urban stormwater BMPs | 60 rain gardens | 21 | 5 |
| **10-year goal** | | **793** | **2,506** |
| **Long-term goal** | | **3822** | 24,486 |

*Data Sources:*

- *The number of practices implemented are based on locally determined achievable levels of implementation over the next 10-years*
- *Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.*
- *Estimated TP Load Reductions for wetland restorations are based on the PTMApp tool for a similarly sized storage BMP. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.*
- *TP and sediment reductions for waste pit closures, nutrient management plans, and urban BMPs will be determined based on final designs/specifications and tracked as part of the annual work planning process (see Section 6.5). These practices likely represent a small fraction of the total load reductions achieved from implementation of the PTMApp structural practices, PTMApp nonstructural practices and wetland restorations.*
- *Phosphorus reductions for waste pit closures were based on an average reduction per pit and divided by 20 years to represent project lifespan.*
- *Long-term goals were based on TMDL load reductions for sediment and phosphorus, applied to the PTMApp surface water runoff load*

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

**Justification for Goals:**

Long-term goals are based on existing TMDL studies for sediment and HSPF modeling for phosphorus. 10-year measurable goals are based on what level of implementation 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:**

A. One-on-one conversations with 35 landowners per year of top-ranked structural and nonstructural practices (from PTMApp) to enroll in cost-share programs.

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; see Table 3-3).

C. Implement 2,580 acres of nonstructural 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; see Table 3-3).

D. Complete 20 wetland restorations (note that these practices overlap with BMPs identified under Altered Hydrology; see Table 3-3).

E. Implement 4 nutrient management plans per year.

F. Implement 4 pit closures over 10 years.

G. Implement 60 BMPs associated with urban stormwater runoff (i.e. rain gardens).

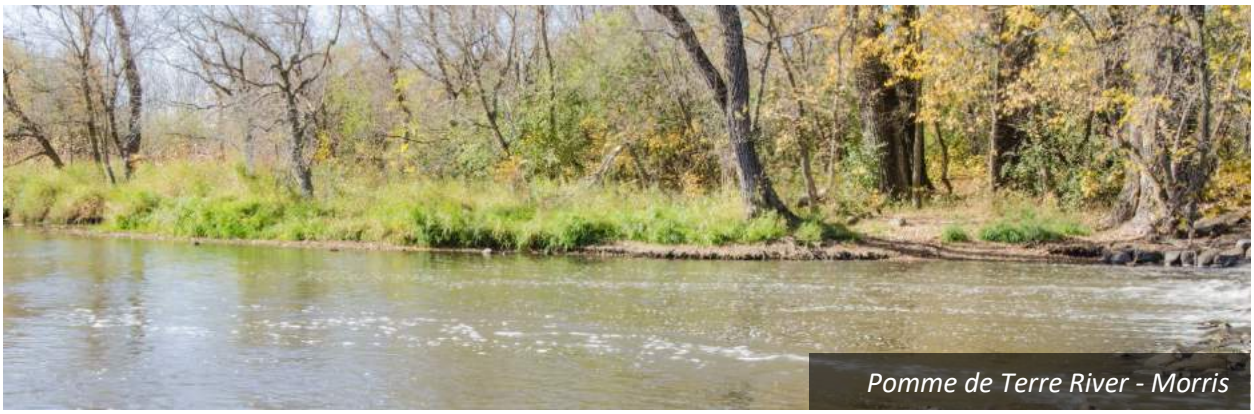
H. Work with cities to develop stormwater management plans in urban areas. Activities include completing steps of stormwater infrastructure inventory, hydrologic analysis, BMP-recommendation development, and development of stormwater erosion and sediment control standards for municipal ordinance and policy inclusion, using MN Stormwater Manual as a guide as part of this assessment.

**Pace of Progress:**

Table 3-12 summarizes the estimated load reduction expected from implementation of each activity using PTMApp.

- The number of practices implemented are based on locally determined achievable levels of implementation over the next 10-years.
- Estimated TP Load Reductions for PTMApp Structural and Nonstructural practices are based on the PTMApp tool. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.
- Estimated TP Load Reductions for wetland restorations are based on the PTMApp tool for a similarly sized storage BMP. See Section 2.4.2 for a detailed discussion on how this model was used to determine load reductions.

- TP and sediment reductions for waste pit closures, nutrient management plans, and urban BMPs will be determined based on final designs/specifications and tracked as part of the annual work planning process (see Section 6.5). These practices likely represent a small fraction of the total load reductions achieved from implementation of the PTMApp structural practices, PTMApp nonstructural practices and wetland restorations.



*Pomme de Terre River - Morris*

### 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):**

The long-term goal for in-stream habitat is to have stream channels that maintain physical, chemical and biological functions of a stream, 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 at 10 of the DNR-identified erosion sites from the 2018 inventory.

**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:**

A. Implement 1 BMP per year to reduce erosion due to livestock such as installing crossings and exclusion fencing. Provide alternative water sources.

B. Implement 1 pasture management and rotational grazing plan per year.

C. Complete 1 Streambank Stabilization Project per year.

D. Implement 35 side water inlets where appropriate.

E. Implement 120 acres of buffer on "other waters" as per SWCD resolutions required by buffer law (example resolution can be found in Appendix A) 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 since the 2018 DNR erosion site inventory (see Table 2-2) and the acres of voluntary buffers or nonstructural practices implemented beyond the required width as required in Minnesota buffer law.

## 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:**

A. Annual workshops to coordinate County AIS plans and implementation, or PdTRA holds one meeting per year to discuss AIS.

B. Attend DNR District led twice annual County meetings to share ideas with other watersheds.

C. Continue implementing education programs identified in County AIS plans (explore partnering on innovative techniques including geo-tagging, radio, billboards).

D. Work with local AIS agencies to track the number of inspections and inspection sites.

**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.
- Tracking number of AIS inspections.
- Tracking number of outreach commitments (mailings, billboards, etc.)

## 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 land use and regulatory programs, promoting best practices, encouraging natural resource-conscious land use decisions, and promoting stewardship.

There are three main stakeholder groups in the Pomme de Terre River Watershed that the Joint Powers Board has traditionally worked with: lakeshore, urban, and agricultural. 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 (lakeshore, urban, and agricultural) to assess, build, and leverage community capacity (i.e. community resources and values). We will develop and implement surveys to measure awareness of water quality issues.

**Goal 2:** Increase number of BMPs adopted by 10 percent from year 1 to year 10 based on data collected from BMP tracking database, by increasing engagement and communication with lakeshore owners, urban residents and agricultural producers within the priority areas 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:** Provide additional education and outreach opportunities, to all watershed residents, that highlights and promotes economic and environmental benefits of conservation practices 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:

A. Establish and facilitate networking/advisory groups for targeted groups (lakeshore, urban, agriculture, etc.). Each group should convene on a rotation, i.e. if there are three groups, each group will meet on a rotating basis once every three years.

B. Establish soil health teams for Northern and Southern Regions. Two meetings per group per year.

C. Regional tours (every 2 years) on prioritized portions of the watershed to facilitate partnerships, highlight improvements, and discuss upcoming priorities for the area.

D. 2 BMP-focused (i.e. raingardens, lakeshore restoration, native plantings, land retirement programs, etc.) demonstrations/workshops in the watershed each year.

E. Host one soil health field day per year, alternate between north and south regions of the watershed every other year.

F. 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.

G. Conduct a 5-year watershed tour to re-evaluate progress, reconnect with partners, and create new partnerships.

H. Host conversation/meeting on the state of local water quality and importance of watershed management and extend an invitation to all types of local officials and relevant state/federal officials every other year.

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 (cities, SWCDs, counties, townships, etc.) on an annual basis.

J. Coordinate with UMN Extension to host a watershed education event within watershed twice over the 10 year period.

K. Conduct annual kayak tour on the Pomme de Terre River to raise awareness of the resource and provide education about streamside ecology.

L. Continue K-12 curriculum about watershed management.

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 and update annually.

N. Create an email list to share information about the watershed once a year.

**Pace of Progress:**

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

- Number of networking groups created & 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 event attendees who implement practices as determined by follow-up surveys or phone calls.
- 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:** Create a plan to develop and implement a survey to measure increased 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:**

A. 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.

B. Educational materials and survey will be distributed to existing lakeshore owners via brochure with link in tax mailing.

C. Educational materials and survey will be 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 4-3 through Table 4-8 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 (pace of progress).
- All activities will be carried out over the 10-year timeframe unless stated otherwise.

Costs were determined based on a combination of hourly rates for the total number of staff hours required for each implementation activity, plus any cost-share or construction costs associated with implementation of each activity. See Table 4-1 for specific unit cost assumptions.

**Table 4-1.** Unit cost assumptions

| Implementation Activity | Unit | Total Unit Cost | Cost Share Percentage | Total Cost Share | Source of Total Unit Cost |
|---|---|---|---|---|---|
| Structural PTMApp practices | # | $9,911.82 | 75% | $7,433.87 | PTMApp average present value Total Cost with 20 year maintenance |
| Nonstructural PTMApp practices | acres | $918.35 | 75% | $688.76 | PTMApp average present value Total Cost with 20 year maintenance |
| Wetland restorations | acres | $10,722.00 | 75% | $8,041.50 | Tyndall and Bowman Wetland 2016 Cost for First year; Plan didn't mention an easement so we didn't include all of the costs associated with the wetland restoration |
| Well Sealing | # | $300.00 | 100% | $300.00 | PdTRA estimate based on past implemented practices |
| Shoreline BMPs | # | $5,000 | 75% | $3,750 | EOR estimate based on past implemented practices |
| Septic systems | # | $10,000.00 | 0% | $0.00 | PdTRA estimate based on past implemented practices |
| Side Inlet | # | $3,000.00 | 75% | $2,250.00 | PdTRA estimate based on past implemented practices |
| Perennial vegetation | acres/yr | $145.00 | 100% | $145.00 | PdTRA estimate based on past implemented practices |
| Exclusion fencing | # | $10,000.00 | 75% | $7,500.00 | PdTRA estimate based on past implemented practices |
| Exclusion fencing | acres | $500.00 | 75% | $375.00 | PdTRA estimate based on past implemented practices |

**Table 4-2.** 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** | 5,485,281 | 5,432,421 | 5,406,896 | 5,408,756 | 5,407,436 | 5,406,326 | 5,406,806 | 5,404,346 | 5,403,996 | 5,402,256 | 54,164,516 |
| **GROUNDWATER** | 84,311 | 47,636 | 47,636 | 44,636 | 44,636 | 44,636 | 44,636 | 49,016 | 50,636 | 52,096 | 509,874 |
| **LAKES, WETLANDS AND SHALLOW BASINS** | 496,392 | 516,884 | 623,567 | 651,748 | 622,667 | 643,537 | 651,607 | 727,738 | 622,667 | 657,448 | 6,214,255 |
| **RIVERS AND STREAMS** | 120,152 | 113,717 | 108,502 | 103,942 | 103,177 | 109,792 | 107,827 | 103,267 | 112,502 | 113,222 | 1,096,097 |
| **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** | **6,364,267** | **6,193,861** | **6,276,129** | **6,298,347** | **6,277,831** | **6,296,294** | **6,300,405** | **6,367,570** | **6,247,764** | **6,286,885** | **62,909,354** |


*Wetland Restoration*

### 4.1.1 Groundwater Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-3.** 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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.** | Implement 5-10 BMPs within DWSMA areas over the 10 year period. | DWSMA's within Pomme de Terre River Lakes Chain, River Corridor | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 11,084 | 110,840 | Federal, State | SWCDs | | | **S** | | **S** | **S** | | BWSR, MDH, NRCS, FSA, MDA | # of practices implemented |
| **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 Water Association, MDA | One wellhead meeting attended annually |
| **3.1.1-C** | | Contact agricultural 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, MDA | 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, MDA, Schools, County Fairs | Number of clinics held |
| **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 | 99,000 | State | SWCDs | | | | | **S** | **C** | | Cities, BWSR, MDH, MDA | Number of unsealed wells and number of abandoned wells sealed |

| 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2021 $ | 2022 $ | 2023 $ | 2024 $ | 2025 $ | 2026 $ | 2027 $ | 2028 $ | 2029 $ | 2030 $ | 10-Year Project Cost | | | Big Stone | Douglas | Grant | Otter Tail | Stevens | Swift | PdTRA | | |
| 3.1.2-A | **Assist agricultural producers with groundwater conservation by promoting water conservation measures that improve water use efficiencies and reduce water demand; all counties will request the County Geologic Atlas to fill groundwater monitoring data gaps and continue ongoing observation well monitoring efforts.** | Contact 50% of landowners with agricultural irrigation wells to 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 landowners contacted about irrigation BMPs |
| 3.1.2-B | | Counties will request 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 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** | **C S** | | | | MGS, SWCDs | Recharge and vulnerable areas identified & number of landowners contacted |
| 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 |

### 4.1.2 Altered Hydrology Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-4**. 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 | Priority Areas (see Table 3-3) and Watershed Wide | 1,546,059 | 1,546,599 | 1,546,869 | 1,546,329 | 1,546,329 | 1,547,139 | 1,547,139 | 1,547,139 | 1,546,869 | 1,546,599 | 15,467,071 | 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 (see Table 3-3). | Priority Areas (see Table 3-3) and Watershed Wide | 2,425,243 | 2,425,513 | 2,425,243 | 2,425,243 | 2,425,513 | 2,425,243 | 2,425,243 | 2,425,513 | 2,425,243 | 2,425,243 | 24,253,240 | 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 PTMApp and best professional judgment inclusive of 383 practices that will be targeted within priority areas (see Table 3-3). | Priority Areas (see Table 3-3) and Watershed Wide | 502,458 | 502,458 | 502,458 | 503,538 | 502,458 | 502,458 | 503,538 | 502,458 | 502,458 | 502,458 | 5,026,737 | State | SWCDs | C S | 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 PTMApp and best professional judgment inclusive of 7,370 acres that will be targeted within priority areas (see Table 3-3). | Priority Areas (see Table 3-3) and Watershed Wide | 913,491 | 913,671 | 913,491 | 913,851 | 913,851 | 913,491 | 913,851 | 913,491 | 913,851 | 913,671 | 9,136,707 | Federal, State | SWCDs | C S | 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 functioning BMPs and create spatial database, develop database for tracking projects and making decisions 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 | 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 100% of 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 |

### 4.1.3 Lakes, Wetlands, and Shallow Basins Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-5.** 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 3-6). | Conduct 950 hours of Subsurface Sewage Treatment Systems inspections | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | 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 | # of inspections completed and upgrades |
| 3.3.1-B | | Update 102 Septic Systems found noncompliant through SSTS inspections | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | 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-C | | Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | - | 45,220 | - | - | - | - | - | 45,220 | - | - | 90,440 | State | SWCDs, Counties | C S | C S | C S | C S | C S | | | DNR | Resulting feet of shoreline identified as requiring additional conservation |
| 3.3.1-D | | Implement 47 shoreline restoration projects for erosion control based on shoreline inventories | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | 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-E | | 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). | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | State | SWCDs | S | S | S | S | S | | | Lake Associations, Counties, NRCS, FSA | Calculated Phosphorus Reductions |
| 3.3.1-F | | 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). | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | Federal, State | SWCDs | S | S | S | S | S | | | Lake Associations, NRCS, FSA, Soil Health Team | Calculated Phosphorus Reductions |
| 3.3.1-G | | Lake outreach process. Series of meetings to identify in-lake management and engage affected landowners in lake water quality management. | Direct drainage area to Artichoke, Barrett, Christina, Perkins, Pomme de Terre, and North Turtle Lakes | 20,070 | 12,870 | 2,870 | 1,970 | 1,970 | 7,670 | 1,970 | 1,970 | 1,970 | 7,670 | 61,000 | State, Local | SWCDs, Counties | C S | C S | C S | C S | C S | | | Lake Associations | A series of outreach meetings for 3 lakes. |
| 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 | Conduct 280 hours of Subsurface Sewage Treatment Systems inspections | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | 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 | C | | | | Townships, MPCA | # of inspections completed and upgrades |
| 3.3.2-B | | Update 130 Septic Systems found noncompliant through SSTS inspections | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | 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 | C | | | | Townships, MPCA | Number of updated Septic Systems and calculated Phosphorus Reductions |

| 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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-C** | **project feasibility (Table 3-9).** | Conduct shoreline condition inventories on a parcel-by-parcel basis using a uniform process | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | - | 16,640 | - | - | - | - | - | 16,640 | - | - | 33,280 | State | SWCDs, Counties | | C S | C S | C S | | | | DNR | Resulting feet of shoreline identified as requiring additional conservation |
| **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 3-9).** | Implement 82 structural BMPs for erosion control based on shoreline inventories. | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | - | - | 131,905 | 131,905 | 131,905 | 131,905 | 146,935 | 146,935 | 131,905 | 131,905 | 1,085,298 | State | SWCDs | | S | 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). | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | State | SWCDs | | S | 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) | Direct drainage area to Clear, Eagle, Elk, Pelican, South Turtle, Spitzer and Stalker Lakes | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | See AH budget in Table 4-4 | Federal, State | SWCDs | | S | 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.** | Maintain a total of 3,600 acres of wetlands and grassland enrolled in various conservation cover programs and enroll 400 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 | 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 |

### 4.1.4 River and Streams Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-6.** 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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** | 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, Pomme de Terre 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 |

| 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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-B | **(mid-1990s) in the Drywood Creek and Pomme de Terre River Corridor Priority Area in the next 10 years (by December 31, 2030).** | Implement 188 structural agricultural BMPs based on PTMApp and best professional judgment within Priority Areas (these practices overlap with BMPs identified under Altered Hydrology) | Drywood Creek Area, Pomme de Terre River Corridor | 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 | Phosphorus and Sediment reductions |
| 3.4.1-C | *Continued from above:* **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 PTMApp and best professional judgment within Priority Areas (these practices overlap with BMPs identified under Altered Hydrology) | Drywood Creek Area, Pomme de Terre River Corridor | 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 | | Complete 20 wetland restorations (these practices overlap with BMPs identified under Altered Hydrology) | Drywood Creek Area, Pomme de Terre River Corridor | 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 | | BWRS, NRCS | Phosphorus and Sediment reductions |
| 3.4.1-E | | Implement 4 nutrient management plans/yr | Drywood Creek Area, Pomme de Terre River Corridor | 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 ag pit closures over 10 years | Drywood Creek Area, Pomme de Terre River Corridor | 10,000 | 10,000 | | | | | | | 10,000 | 10,000 | 40,000 | Federal, State | SWCDs | S | | | | S | S | | BWSR, NRCS | Phosphorus and Sediment reductions |
| 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 | | BWRS, 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. | 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, Pomme de Terre 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, Pomme de Terre 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, Pomme de Terre 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, Pomme de Terre 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. | Pomme de Terre River Corridor | 4,905 | 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 USFWS), tracked annually |

### 4.1.5 Ecosystem Health Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-7.** 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 S | C S | C S | C S | C S | C S | | DNR, AIS detectors, MAISR (U of M), Lake associations | One annual staff workshop to discuss county & SWCD AIS programs |
| 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 S | C S | C S | C S | C S | C S | | DNR, AIS detectors, MAISR (U of M), Lake associations | Group to define what AIS they are focusing on - TBD at annual or 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 | 74,237 | State, Local | County | C | C | | C | | C | | DNR, AIS detectors, MAISR (U of M), Lake associations | # inspections |

### 4.1.6 Socioeconomic Factors Issues & Goals Targeted Implementation Schedule (2021-2030)

**Table 4-8.** 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 (lakeshore, urban, and agricultural) to assess, build, and leverage community capacity (i.e. community resources and values). We will develop and implement surveys to measure awareness 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 | 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 | 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 S | C S | C S | C S | C S | C S | 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** | 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 | S | C S | S | S | S | X | | # of locals reached annually and number of BMP cost-share sign-ups as a result of demonstrations/workshops |

| 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 | Pace of Progress |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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-E | **literacy and promote a basic understanding of watershed management.** | Soil health field days | Watershed Wide | 10,000 | 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 |
| 3.6.1-F | | 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 S | C S | C S | C S | C S | C S | 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 S | C S | C S | C S | C S | C S | 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 S | C S | C S | C S | C S | C S | 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 | **Provide additional education and outreach opportunities, to all watershed residents, that highlights and promotes economic and environmental benefits of conservation practices to ensure that conservation efforts are maintained into the future.** | Coordinate with UMN Extension to Host a water education event 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 | 970 | 970 | 15,940 | Local | PDTRA | | | | | | | X | UMN Extension | Number of participants |
| 3.6.1-L | | 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 | 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 | - | - | 43,200 | State | PDTRA | | | | | | | X | | Creation of story map that helps landowners find information. |
| 3.6.1-N | | Create an email list to share information about the watershed on an annual basis | Watershed wide | 7,400 | 7,400 | 7,400 | 7,400 | 7,400 | 7,400 | 7,400 | 7,400 | -- | -- | 59,200 | State | PDTRA | | | | | | | X | | Increase continued outreach to participants with the ability to gauge number of people being reached with materials and educational gains over time with surveys |
| 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 S | C S | C S | C S | | X | Lake Associa-tions | 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 S | C S | C S | C S | | X | Lake Associa-tions | 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 | C | | | | Realtors | Number of new landowners that materials are provided to. |

## 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 4-3 through Table 4-8. 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 4-9.

Federal dollars are included in the table to reflect the contributions of federal partners to the Pomme de Terre watershed. Theses 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.

*First recorded Minnesota Conservation Reserve Enhancement Program wetland easement*

**Table 4-9.** 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 4-9 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 | 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 | | | | | | | | | | | | | | |

| | | Big Stone | | Douglas | | Grant | | Otter Tail | | Stevens | | Swift | | PDTRA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | **Funding Entity** | **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)

*Cattle Exclusion Project*

## 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 water quality aspects of new capital improvements with potential funding partners. Capital improvement projects that receive funding for water quality purposes through this Plan will be operated and maintained by the sponsoring organization. Some examples of potential capital improvement projects that might include a water quality aspect are county and state road bridge replacements and road improvement projects, several of which are currently in a 10-year planning process by county highway departments.

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 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 benefited 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 Ditch30 | | |
| | 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

| | | Big Stone | | Douglas | | Grant | | Otter Tail | | Stevens | | Swift | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | **Funding Entity** | **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, BWSR | | 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

| | | Big Stone | | Douglas | | Grant | | Otter Tail | | Stevens | | Swift | | PDTRA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | **Funding Entity** | C | S | 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. Each SWCD has summarized by resolution “other waters” and they are included in Appendix A. Grant SWCD’s resolution is included as a representative example since all the other SWCDs’ resolutions are the same.

### 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 most cases, the counties administer the regulatory program, while a few of those regulatory programs 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.

| | Big Stone | | Douglas | | Grant | | Otter Tail | | Stevens | | Swift | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | **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: Big Stone County plan adopted in 2002, Douglas County plan adopted in 2011, Grant County plan adopted in 1998, Stevens County plan adopted in 2017.

## 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

| | Big Stone | | Douglas | | Grant | | Otter Tail | | Stevens | | Swift | | PDTRA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | 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 M.i 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 190th 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 185th Ave, 6 Mi. NW of Holloway | Drywood Crk. at 190th 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

The following organizations have have collected water quality data within the Pomme de Terre River Watershed. Several are collecting data on an ongoing basis and this information may be utilized in future water quality and quantity trends, as well as the listing or delisting of impaired water bodies on Minnesota's 303(d) list.

**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 |

| **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 5-19.** 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 5-20.** 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 5-21.** 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 5-22.** Lakes monitored for the MN DNR Shallow Lakes Program

| **Lake Name** | Anka | Christina |
|---|---|---|
| **Lake ID** | 21-0353-00 | 21-0375-00 |

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

| **Lake Name** | Little | Tamarack | Nycklemoe Slough | 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 monitoring program targets representative lakes across different ecoregions in Minnesota. The long-term monitoring program looks at physical, chemical and biological changes in lakes, helping us understand and develop management approaches. Artichoke Lake, selected to represent shallow prairie lakes in western and southern Minnesota with high Phosphorus levels, is the only sentinel lake in the Pomme de Terre Watershed. Information can be located at https://www.dnr.state.mn.us/fisheries/slice/artichoke-lake.html

## 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 5-24.** 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 and public water suppliers monitor and test 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 5-25.** Lakes monitored for the U.S. EPA National Lakes Assessment

| **Lake Name** | Un-named (West) | Unnamed | Fiske | Fiske | Unnamed | Silver | Un-named | Un-named | Unnamed | 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

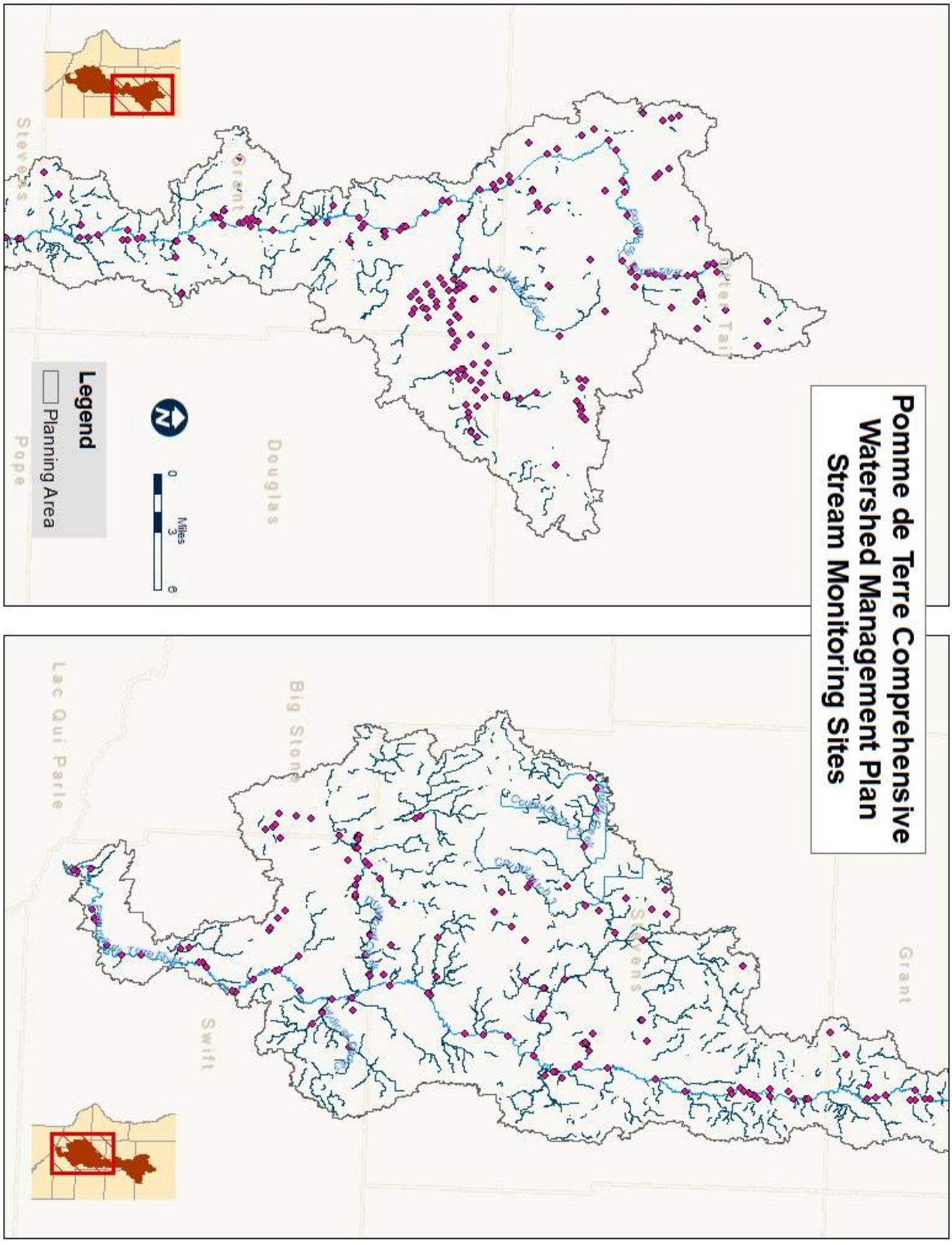



**Figure 5-1.** All streams in the Pomme de Terre Watershed with Monitoring Data

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

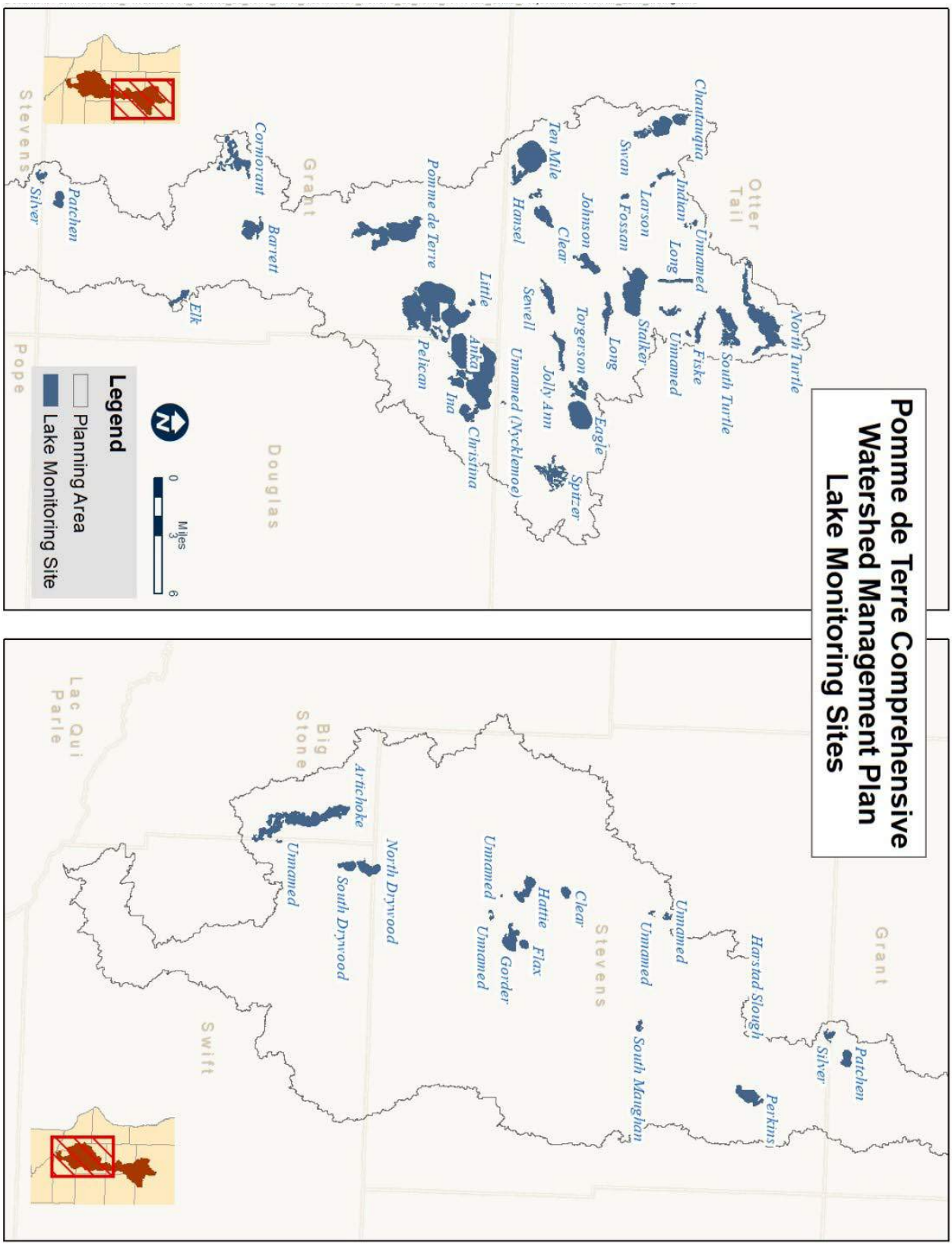



**Figure 5-2.** All lakes in the Pomme de Terre Watershed with monitoring data

### 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 5-26 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.

*Water Quality Monitoring*

**Table 5-26**. 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)** | Y | 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)** | Y | 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.

*2017 Pomme de Terre River Run*

# 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 though 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.

*Pomme de Terre River – Jake Krohn*

## 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

<table>
<tr><th rowspan="2">Project Type</th><th colspan="2">Targeting Methodology</th></tr>
<tr><th>Priority Area Scale</th><th>Field Scale</th></tr>
<tr><td>Shoreline/streambank restorations</td><td>GIS Terrain Analysis</td><td>Shoreline inventories (Implementation Activity)<br>2018 DNR Erosion Sites surveys</td></tr>
<tr><td>Septic system improvements</td><td colspan="2">Septic system inspections</td></tr>
<tr><td>Groundwater BMPs</td><td>Hydrogeologic section of the County Geologic Atlas (Section B)</td><td>MDA Vulnerable Groundwater Area Map this map identifies areas where nitrate can move easily through soil and into groundwater, contaminating drinking water sources.</td></tr>
<tr><td>Wetland restorations</td><td rowspan="3">PTMApp to help identify specific locations for BMPs.<br>Urban BMPS – Priority Management Zones identified during the 2013 WRAPS process</td><td rowspan="3">Results from PTMApp will be reviewed by local staff to verify site-specific feasibility.</td></tr>
<tr><td>Non-structural BMPs</td></tr>
<tr><td>Structural BMPs</td></tr>
</table>

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

<table>
<tr><th rowspan="2">Project Type</th><th colspan="2">Measuring Tool</th></tr>
<tr><th>Priority Area Scale</th><th>Field Scale</th></tr>
<tr><td>Shoreline/streambank restorations</td><td colspan="2">BWSR Water Erosion Pollution Reduction Estimator</td></tr>
<tr><td>Septic system improvements</td><td colspan="2">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.)</td></tr>
<tr><td>Wetland restorations</td><td rowspan="4">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.</td><td rowspan="4">The pollutant reduction of each individual project will be based on PTMApp reduction assumptions.</td></tr>
<tr><td>Urban BMPs</td></tr>
<tr><td>Non-structural BMPs</td></tr>
<tr><td>Structural BMPs</td></tr>
</table>

### 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. The summary tables in the Executive Summary of this plan include a Status column, which will be used to track progress on an annual basis. This status update will be used to present plan progress to policy makers and the public, via website or handouts. 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 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. Partners will utilize data from the spatial database as part of the five year evaluation process. The five year evaluation will enable the Committees and the Planning Partners to assess progress to date and determine whether any new information needs to be included to improve plan prioritization, targeting, and measurability. At this time, the partners will consider whether re-running PTMApp will be worthwhile. 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 ten years past the date it was approved by BWSR (see Appendix for BWSR order of approval). 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. 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 BWSR 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 BWSR. 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 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.

*2018 One Watershed, One Plan Open House Event*