Park River Watershed Project Implementation Plan Phase II

SPONSOR:
Walsh County Three Rivers Soil Conservation District
13351 Hwy 17 W
Park River, ND 582740
Phone: (701) 284-7363
E-mail: walshcounty319@polarcomm.com

STATE CONTACT PERSON:
Greg Sandness
North Dakota Department of Health
Phone: (701) 328-5232
Fax: (701) 328-5200
E-mail: gsandnes@nd.gov

STATE: North Dakota
WATERSHEDS: Park River Watershed, including Homme Dam Reservoir
HYDROLOGIC UNIT CODE: 09020310 **HIGH PRIORITY WATERSHED:** Yes
TMDL STATUS: Homme Dam Reservoir – TMDL in 2012
The Park River has no TMDL

TMDL Implementation

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
[ ] STAFFING & SUPPORT	[ ] GROUNDWATER	[X] AGRICULTURE
[X] WATERSHED	[X] LAKES/RESERVOIRS	[ ] URBAN RUNOFF
[ ] GROUNDWATER	[X] RIVERS	[ ] SILVICULTURE
[ ] I & E	[X] STREAMS	[ ] CONSTRUCTION
	[ ] WETLANDS	[ ] RESOURCE EXTRACTION
	[ ] OTHER	[ ] STOWAGE/LAND
		[ ] DISPOSAL

PROJECT LOCATION: Latitude: 48.40628 Longitude:-97.79094
Walsh County

MAJOR GOAL:

The main goal of this watershed program is to restore beneficial uses of recreation and aquatic life to the Homme Dam reservoir, and to improve water quality and riparian areas in the watersheds for the South, Middle, and North Branches of the Park River for fish and aquatic biota facing impairments due to non-point source pollution.

PROJECT DESCRIPTION:

The watershed project will:

1. Restore recreation uses at Homme Dam through the maintenance of chlorophyll-a concentrations in the reservoir at the level of 16 µg/L. Meeting this target requires the reduction in phosphorus loading into the reservoir by 40%. The reduction in phosphorus also would benefit the impaired function of the fishery and associated aquatic species.

2. Improve conditions in riparian areas and reduce non-point sources of phosphorus loading from cropland and non-cropland areas in impaired reaches of the North, Middle and South Branches of the Park River.

3. Deliver technical and financial assistance for the implementation of best management practices (BMPs) within PTMApp priority areas on cropland, rangeland, and adjacent riparian corridors in the watershed.

4. Partner with producers, landowners, communities, local government, local agencies, and other stakeholders to coordinate conservation planning that will address resource concerns and benefit natural resources in the watershed.

5. Form a Park River Watershed Committee to aid in watershed planning for the reduction of non-point source pollution impacting water quality.

6. Document trends in water quality over the course of the project, including chlorophyll-a concentrations and phosphorus loading and evaluate progress towards established water quality goals.

7. Educate landowners, students, and other stakeholders on NPS pollution concerns and solutions, including soil erosion, nutrient transport, and harmful algae blooms (HABs) at the Homme Dam reservoir.

8. Coordinate at the closest levels with the Soil Health Team in Walsh County to provide BMP recommendations for implementation in the watershed.

9. Coordinate with the NDDEQ and International Water Institute to utilize the PTMApp Decision Support Tool for the Park River Watershed developed in 2020 to allow for better prioritization and identification of watershed and field areas for nutrient and sediment reduction.

Total 319 FY 21 Funds Requested: $283,621 Local Match: $189,081
Other State and Federal: $1,110,000 Total Budget: $1,704,002
319 Funded Full Time Personnel: 1.5 FTE

ACCOMPLISHMENTS TO DATE

Partnerships and successful collaborations are the primary success of the program to date. These partnerships provide opportunities for landowners to learn from one another, and to receive technical and financial resources from agencies. The program also has collaborative partners to promote sustainable food ingredients, soil health, and water quality.

PARTNERSHIPS	
ND Department of Environmental Quality (NDDEQ)	NDSU Livestock Stewardship Specialist
ND Forest Service (NDFS)	NDSU Soil Science Extension Specialist
ND Game & Fish Department (Save Our Lakes)	319 BMP Team
ND Natural Resource Trust (NDNRT)	General Mills
Natural Resource Conservation Service (NRCS)	

Actions to date include:

- Initiated and coordinated the Walsh County Soil Health Demonstration Project (also referred to as the No-Till Demonstration Project). Educated landowners on strip till by hosting a roundtable meeting in Grafton in February 2020. Currently, there are four producers enrolled in the No-Till Demonstration Project, which runs until 2023. This project will help demonstrate the utilization of no-till and strip still cropping systems with sugar beets in a four-year rotation. The project was presented at the 2021 Red River Basin Commission Annual Convention. Funding was acquired through General Mills for all four participants.
- Initiated education to public via media regarding harmful algae blooms (HABs), available funding, No-Till Demonstration Project, newsletters, cover crops, conservation issues that relate to farming and water quality, etc.
- Coordinated with NDDEQ to implement a Quality Assurance Project Plan (QAPP) to track in-lake trends in chlorophyll-a concentrations and annual phosphorus loading to the reservoir (Homme Dam).
- Organized Riverbank Education Tour for landowners in July 2019.
- Assisted with coordinating the Cover Crop Tour Workshop in October 2018.
- Provided one-on-one consultations with landowners on the farm and promotion of practices and programs to bring conservation solutions to landowners.
- Promoted the program through direct mailing to watershed landowners.

2.0 STATEMENT OF NEED

The need for an implementation program in the Homme Dam watershed began in 2010, when the North Dakota Department of Environmental Quality (NDDEQ) identified Homme Dam as an impaired water body, and listed it on the 2010 Clean Water Act Section 303(d) list of impaired waters. Based on a Trophic State Index (TSI) score, “Fish and Other Aquatic Biota”

and "Recreation" uses of Homme Dam are impaired due to excess nutrients, eutrophication, and biological indicators.

Homme Dam was a high priority for TMDL development, and in 2012 the TMDL was approved by EPA. The first phase of implementation began in fall of 2014 and was funded until 2018. The Walsh County Three Rivers Soil Conservation District (SCD) seeks to continue work to restore the S. Branch of the Park River upstream of the Homme Dam in the next phase of the project to restore the water quality in the reservoir.

The reservoir's recreation is often impaired by harmful algae blooms (HAB's) caused by eutrophication. Harmful algae blooms (HABs) occur in the summer months of June-September, which has hindered the ability of the public to safely enjoy water recreation activities (Figure 1). The local community is concerned about HABs and its impact to health, and the economy due to a loss of recreation that would normally draw people to this very popular reservoir. The county has invested in kayaks and paddle boats to enhance water related activities at the reservoirs. It is not uncommon for visitors to cancel trips to the area due to poor water quality conditions.

Figure 1. Homme Dam swim beach experiencing a harmful algae bloom in August 2017.

The public became aware of harmful algae blooms in 2015, during the first summer of the Homme Dam Watershed Project. In August 2020, algae toxin levels were over 2000 ppb of microcystin toxin, or 200 times the maximum limit for safe recreational use in the bloom. According to *Cyanobacteria Poisoning (Blue-green Algae),* the recreational limit for microcystin is 10 ppb[1]. HABs testing and monitoring have been conducted in a close collaboration between NDDEQ and the watershed coordinator. Small children and dogs, who are most susceptible to toxicity from cyanobacteria toxins, are frequent visitors at the swim beach and fishing docks, where algae blooms accumulate.

In addition to continuing water quality improvement efforts in the Homme Dam Watershed, the SCD also seeks to expand assistance efforts to impaired reaches of the three branches Park River. Several segments of the South Branch, Middle Branch, and North Branches of the

[1] Cyanobacteria Poisoning (Blue-green Algae) publication revised in 2015 by Miranda A. Meehan (NDSU Extension) and Michelle Mostrom (Veterinary Toxicologist); publication was initially authored by Charlie Stoltenow (NDSU Extension) in 1997.

Park River are listed on the 303(d) list with the following impairments:

- North Branch of the Park River has 27.63 miles of stream and tributaries were determined to be "not supporting" fish and aquatic biota in combination benthic and fishes bioassessments.
- Middle Branch of the Park River has 25.47 miles of stream and tributaries "Fully Supporting But Threatened" were determined to be "not supporting" fish and aquatic biota in combination benthic and fishes bioassessments.
- South Branch of the Park River was listed as "Fully Supporting But Threatened" fish and aquatic biota due to Selenium.
- [2]Stream Visual Assessment Protocol (SVAP) scores on for riparian areas of the S. Branch of the Park River resulted in many of the sampled sites receiving a poor to fair ranking (Table 1). The evaluation takes into account hydrology, streambanks, soil, and riparian vegetation.

Table 1. South Branch Park River Stream Assessment Results

SVAP Rank	Number of Sites
Good	5
Fair (high)	27
Fair (medium)	5
Fair (low)	15
Poor	25
No Ranking	1

In 2019, the SCD Board and its agency partners met to form a strategic plan to address resource concerns. Our mission is "to promote and demonstrate soil and water conservation by offering financial, technical, informational, and educational assistance and opportunities to the people in our District." The top concerns discussed in the strategic plan included soil erosion, forestry (tree planting, renovation, wildlife habitat, windbreaks), water quality, soil health (cover crops, conservation tillage, crop rotation), riparian areas, and education (youth and adult). Flooding is a major concern since Walsh County is in a 100-year flood plain[3]. The District utilizes the watershed program as a vehicle to approach multiple resource concerns affecting the Park River Watershed.

2.1 Homme Dam (HUC 09020310-001) is located on the South Branch of the Park River located two miles west of Park River. The dam is operated by the US Army Corp of Engineers out of the Lake Ashtabula station, Valley City, N.D. Completed in 1950, Homme Dam is a 185-acre reservoir designed for flood control and water supply benefits[4]. At full pool, Homme Dam covers a surface area of 185 acres, has a maximum depth of 34.5 feet and an average depth of 16.5 feet. The Homme Dam watershed is a 131,699-acre watershed in the Park River basin located in Cavalier and Walsh counties (Appendix 1).

Homme Dam has been classified as a Class 3 warm-water fishery, "capable of supporting natural reproduction and growth of warm-water fishes (i.e., largemouth bass and bluegill) and associated aquatic biota and marginal growth. Some cool water species may also be

[2] Watershed Assessment for Walsh County, North Dakota. NRCS 2008.
[3] Report prepared by Houston Engineering, Inc., and the Park River Joint Water Resource District in 2015, North Branch Park River Watershed Feasibility Report and Plan of Work; HEI 2015.
[4] ND Department of Environmental Quality, Nutrient TMDL for Homme Dam in Walsh County, North Dakota, NDDEQ 2012.

present"[5]. The trophic status of the Homme Dam reservoir was determined to be eutrophic to hypereutrophic based on water quality data collected from 2010 to 2011by the SCD and analyzed by the NDDEQ.

The reservoir provides several recreational opportunities. Since 1953, Homme Dam Recreation Area has been a popular place for local residents' recreational needs – offering fishing, swimming, boating, camping, hiking, hunting, and snowmobiling.

2.2 A PTMApp for the Park River Watershed has been developed by the International Water Institute and the NDDEQ. The PTMApp calculates total nitrogen, phosphorus, and sediment. The PTMApp allows for prioritization at the watershed scale and field scale to identify specific areas for nutrient and sediment reduction. This application will be used to set watershed priorities within the North (Figure 2), Middle (Figure 3), and South (Figure 4) Branches, which also include the Homme Dam Reservoir (Figure 5). It will also be used during consultations with landowners to discuss BMP options and benefits at the field scale.

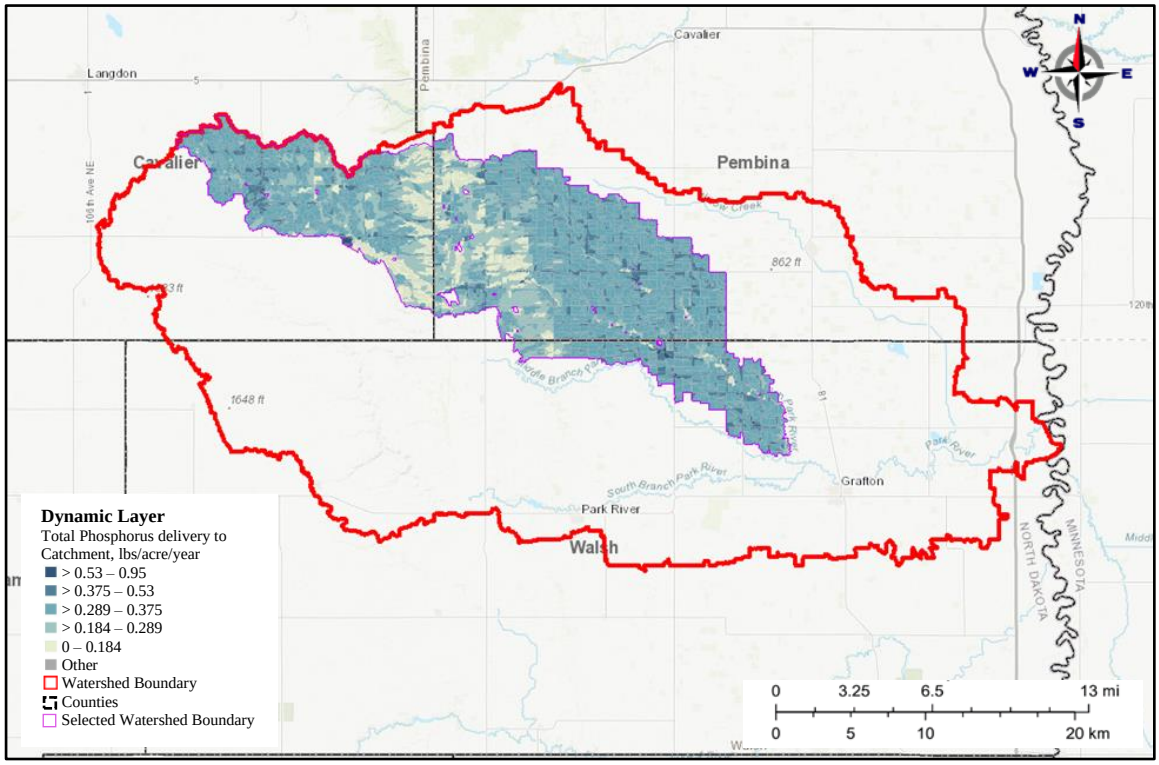


Figure 2. Outlet of the North Branch Park River Watershed before it joins the Middle Branch (Priority Resource 9).

[5] Proposed Rule Amendment Summary, Supporting Information and the Proposed: CHAPTER 33-16-02.1, STANDARDS OF QUALITY FOR WATERS OF THE STATE; NDDEQ 2011.

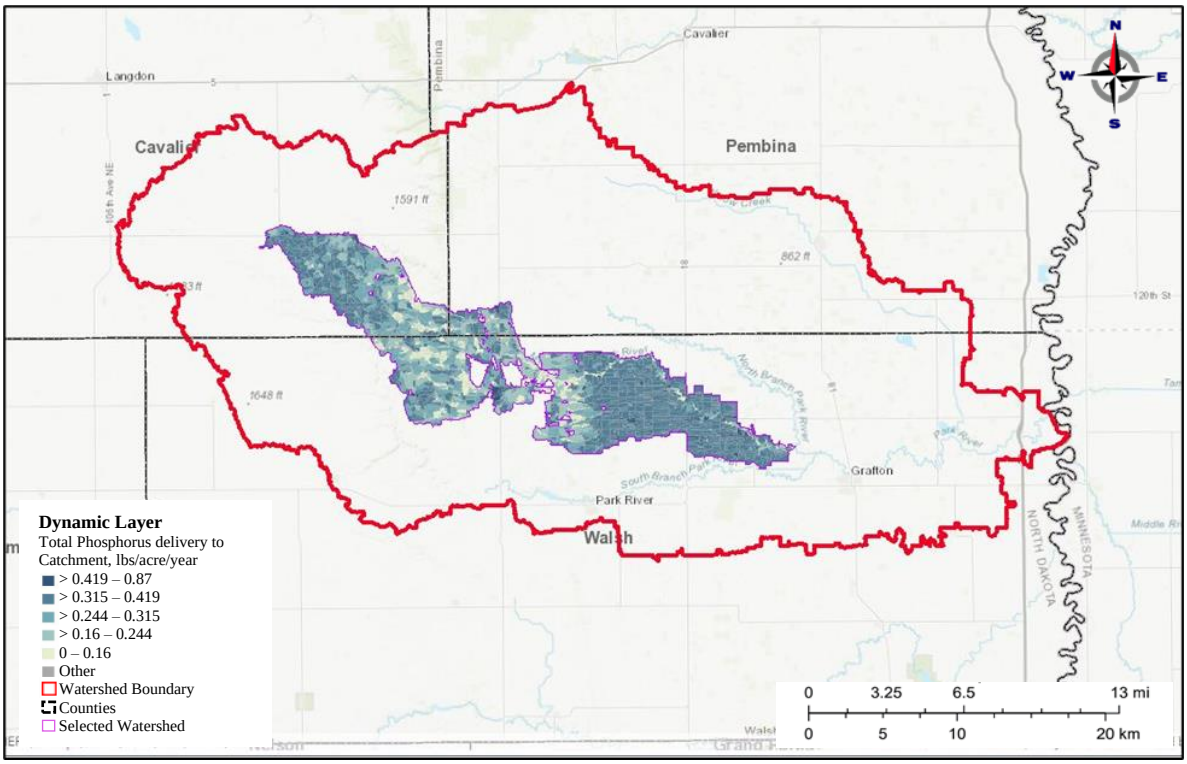


Figure 3. Middle Branch Park River Watershed before the North Branch flows into it (Priority Resource 10).

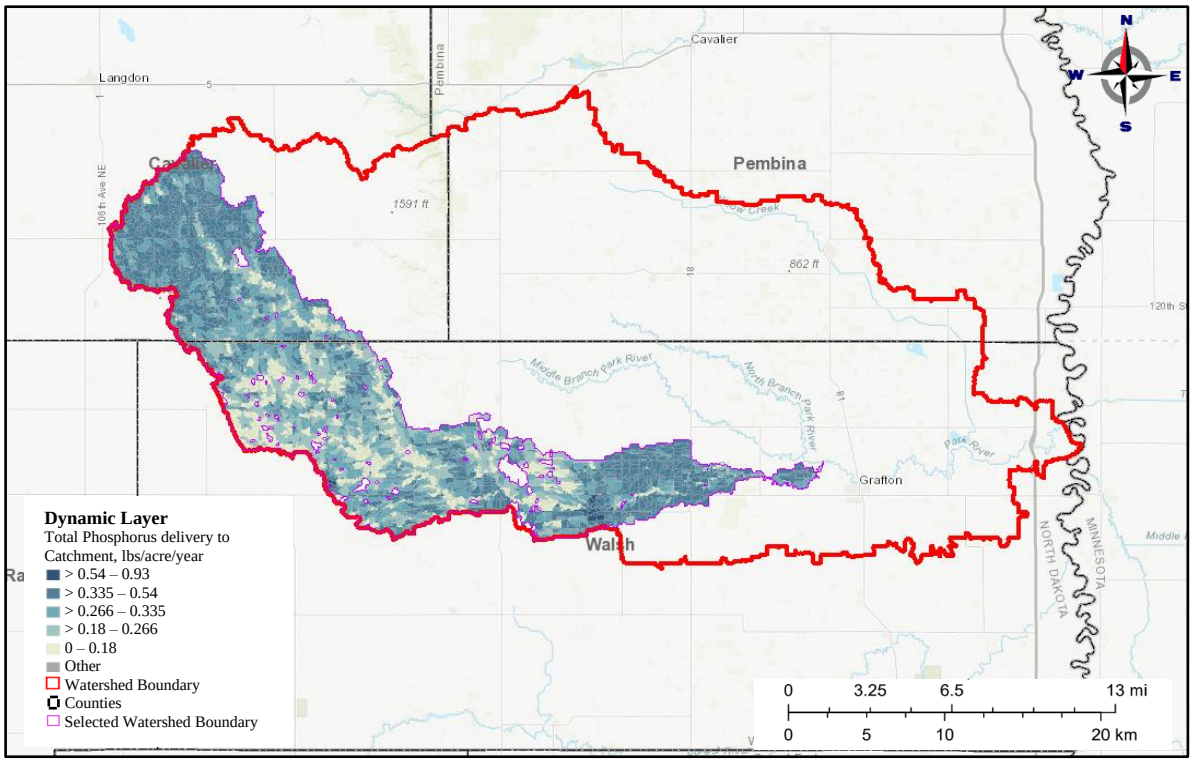


Figure 4. Outlet of the South Branch Park River Watershed before it joins the Middle Branch (Priority Resource 11).

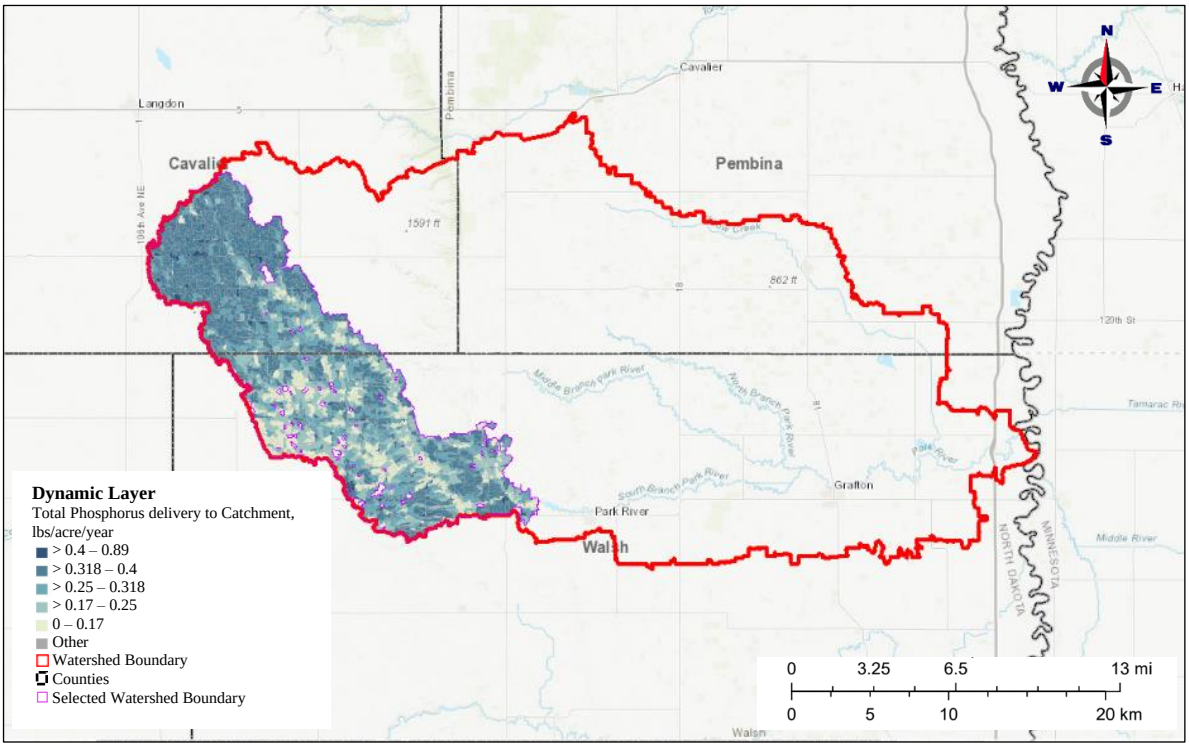


Figure 5. PTMApp inlet into Homme Dam (Priority Resource 2).

The topography of the Park River Watershed varies from west to east due to glaciation. Elevation changes dramatically from Homme Dam in western Walsh County at 1,120 ft to 825ft at Grafton in eastern Walsh County. In western Walsh County, in what is referred to as the Glacial Till Plain, the landscape is comprised of undulating hills in addition to terminal moraines that are hilly. The area is categorized as Major Land Resource Area (MLRA) 55, the Northern Black Glaciated Plains. Within hilly areas, temporary or seasonal wetlands are not uncommon. Outcrops of shale bedrock from the Cretaceous age are exposed across the glacial till plain where the rivers and ravines drain into the lake bed. In general, the soils of the Glacial Till Plain largely consist of glacial till, sand and gravel deposits, and cobble substrate. These soils formed in calcareous loam and clay loam glacial till and the associated alluvium from the till process[6].

Several Lake Agassiz beach lines exist within the glacial till plain[7]. Several more ancient beach lines lie in the elevation gradient experienced transitioning east until approximately five miles west of Highway 18 until it gradually flattens into level the glacial lake bed where little or no slope exists. This area is classified as MLRA 56, “Red River Valley of the North”. The western lake bed consists of very fine sand, silt, and silty clay loam (USDA SCS 1972). On the eastern lake bed, clay and silty clay were deposited. The climate supports a grassland transition between short grass prairie in the west and tallgrass prairie towards the east portion of the watershed. Agriculture has replaced most of the grassland areas. Riparian areas face degradation and are often encroached upon by agriculture, including grazing of narrow riparian corridors.

[6] Soil Survey of Walsh County, ND written by R. Hetzler, R. Dahl, K. Thompson, K. Larson, B. Baker, and C. Erickson, USDA SCS 1972.
[7] Unpublished SCS 1942 Report of the Park River Watershed, First Soil Conservation Demonstration Site in North Dakota, USDA SCS 1942.

According to the 2016 National Agricultural Statistical Service (NASS) land survey, the 251,021 acres in the project area can be classified as follows:

- 66% active cropland
- 15.25% pasture or grassland,
- 6.4% wetlands,
- 4.62% are riparian woodlands or shelterbelts,
- 5.3% barren or urban development,
- 1.12% tamegrasses or planted grass,
- 0.50% alfalfa.

Crops commonly grown in the lower elevations of the watershed in fertile lake bed soils include spring wheat, soybeans, corn, potatoes, and sugarbeets. The Homme Dam sub-watershed include spring wheat, edible beans, soybeans, canola and corn.

The climate of the Park River Watershed is characterized as sub-humid with warm summers with frequent hot days and occasional cool days. Very cold winters are influenced by blasts of arctic air surging over the area. Average temperatures range from 20° F in the winter to 68° F in the summer. Precipitation occurs primarily during the warm period and is normally heavy in late spring and early summer. Total average annual precipitation is approximately 20 inches. approximately 16 inches or 85 percent of rain falls between April and October.

2.3 Historical water quality data was collected in 1996 and 2006 in Lake Quality Assessments (LWQA). Results indicated that nutrient levels in Homme Dam increased two-fold between 1996 and 2006 (NDDEQ 2012).Further testing took place in 2010 and 2011 during the watershed assessment conducted by the Walsh County Three Rivers SCD. Water quality monitoring was conducted on one inlet site, one outlet site and the deepest area of the reservoir. In 2010, average growing season (April-November) total phosphorus concentrations were 0.338 mg/L and average chlorophyll-a concentrations was 13.3 µg/L (Table 2). Water quality data for 2011 indicated average growing season total phosphorus concentration was 0.233 mg/L and average chlorophyll-a concentration was 20.5 µg/L (Table 3).

Table 2. 2010 Homme Dam (Deepest Site) Water Quality Data Summary (NDDEQ 2012).

Parameter	N	Average	Minimum	Maximum	Median
Total Phosphorus (mg/L)	27	0.338	0.194	0.884	0.302
Dissolved Phosphorus (mg/L)	24	0.300	0.176	0.776	0.260
Total Nitrogen (mg/L)	27	1.600	1.020	2.290	1.490
Total Kjeldahl Nitrogen (mg/L)	27	1.000	0.839	1.175	0.975
Nitrate/Nitrite (mg/L)	27	0.270	0.015	0.870	0.180
Chlorophyll-a (µg/L)	9	13.300	0.750	36.700	12.200
Secchi Disk (meters)	9	1.300	0.600	2.700	1.200

Table 3. 2011 Homme Dam (Deepest Site) Water Quality Data Summary (NDDEQ 2012).

Parameter	N	Average	Minimum	Maximum	Median
Total Phosphorus (mg/L)	29	0.233	0.117	0.904	0.184
Dissolved Phosphorus (mg/L)	29	0.189	0.078	0.758	0.147
Total Nitrogen (mg/L)	29	1.615	0.936	2.750	1.350
Total Kjeldahl Nitrogen (mg/L)	29	0.987	0.321	1.534	0.975
Nitrate/Nitrite (mg/L)	29	0.422	0.015	1.240	0.086
Chlorophyll-a (µg/L)	10	20.50	0.750	61.40	17.90
Secchi Disk (meters)	9	1.300	0.400	2.100	1.300

During the growing seasons the average Secchi disk transparency in 2010 and 2011 was 1.3 meters. In 2010, the maximum Secchi disk transparency measurement recorded was 2.7 meters, while the maximum measurement in 2011 was 2.1 meters (Tables 2 & 3) (NDDEQ 2012). Water quality data collected in Homme Dam in 2010 and 2011 showed an average chlorophyll-a concentration of 16.9 µg/L (TSI = 58.3) and average Secchi disk transparency depth of 1.3 meters (TSI = 56.4). Based on these data, Homme Dam is generally assessed as a eutrophic lake. Total phosphorus data and corresponding TSI value of 83.4, which characterizes Homme Dam as hypereutrophic.

The TSI target of 58.3 for chlorophyll-a will be a trophic state sufficient to maintain both aquatic life and recreation uses of Homme Dam (Table 4). The chlorophyll-a TSI target will be achieved by reducing annual phosphorus inputs to the lake by forty percent which equates to a total phosphorous load capacity of 8,996.4 kg/yr or a daily load of 24.6 kg/day. Phosphorus loads into the reservoir could be reduced by forty percent by addressing nutrient management in the PTMApp catchments identified as major phosphorus contributors to the priority resource point at the inlet to Homme reservoir.

Table 4. Carlson's Trophic State Indices for Homme Dam (NDDEQ 2012).

Parameter	Relationship	Units	TSI Value	Trophic Status
Total Phosphorus (TP)	TSI (Chl-a = 30.6 + 9.81[ln(Chl-a)]	µg/L	58.3	Eutrophic
Chlorophyll-a	TSI (TP) = 4.15 + 14.42[ln(TP)]	µg/L	83.4	Hypereutrophic
Secchi Disk (SD)	TSI (SD) = 60 – 14.41[ln(SD)]	µg/L	56.4	Eutrophic

TSI < 30 – Oligotrophic (least productive) TSI 30-50 Mesotrophic
TSI 50-65 Eutrophic TSI > 65 - Hypereutrophic (most productive)

Nutrient loading into Homme Dam originates 100% from non-point source pollution (NDDEQ 2012). These nutrient loads are primarily transported with overland runoff from agricultural areas, riparian degradation, and over-utilization by livestock in the riparian corridor. Existing land use and Annualized Agricultural Non-Point Source pollution modeling (AnnAGNPS) within the watershed indicates that the majority of NPS loading is coming from cropland.

Implementation of best management practices by producers in the watershed will be necessary in order to address loading from NPS sources. Sediment loading upstream of

Homme Dam could be reduced by working with livestock producers who are managing cool season riparian pastures that are often grazed for long periods of time. We have worked with several producers with small beef herds, discovering that producers generally don't have many areas to rotate cattle to other riparian areas. By finding ways to rotate cattle to feeding areas other than the riparian zone, such as crop aftermath grazing, cover crop grazing, or temporary feeding in paddocks, we can reduce over-utilization of riparian pastures. Further consultation with NDSU Extension specialists will result in broadening options for livestock producers needing alternative forage for livestock to accomplish rotation goals.

Riparian areas and their related hydrology are a very complex topic, especially in Walsh County. The SCD and its partners incorporated riparian areas as a major resource concern into its strategic planning session in 2019. Emphasis on restoring these areas through the Park River Watershed Project (PRWP) is further underscored by the demand for restoration practices and the recent end of the Red River Regional Councils 319 Riparian Program. Based on a report by HEI, flooding within the Park River Watershed has been a frequent issue over the years (HEI 2015). In Walsh County, there are many farmsteads and communities next to waterways that face flooding and streambank erosion problems (Figure 6). The PRW program will help address these concerns and help restore affected areas. Riparian areas found within priority PTMApp catchments are expected to experience an increase in overall function as streambank erosion is reduced through riparian and cropland BMPs. Improvements in water quality are expected to be accomplished through increasing riparian vegetation and buffer widths to reduce channel erosion and improve function.

Figure 6. Riparian restoration site west of Edinburg, ND showing the installation of vegetation in 2016, and its progress towards renewal in 2019.

We are working to incorporate soil health principles into producers' farming practices across the watershed in an effort to reduce the amount of runoff, sediment transport, and NPS pollution from cropland. Looking into the history of soil erosion in the Park River Watershed, soils in both the east and west portions of the watershed were greatly affected by wind erosion if not covered in the dirty thirties, due to sandy loam and silty loam textures (USDA SCS 1942). In Dr. Franzen's article, *Wake Up Call*, he describes how Dr. Hopkins and Montgomery compare erosion rates on cropland within the Red River Valley. He also states that over 50% of topsoil in the South Branch of the Park River Watershed has been lost since 1960.[8]

[8] Publication written by Dr. David Hopkins and Brandon Montgomery in 2014; Evaluation Dynamic Soil Change in The Barnes Soil Series

Soil erosion is a major concern of landowners and conservationists in the county. The Walsh County Soil Health Team[9] continues to educate producers on how they can use BMPs such as no-till farming coupled with cover crops to reduce soil erosion, increase infiltration, improve soil structure, increase soil water holding capacity, and overall health of their soils. These practices will benefit water quality by reducing soil erosion and sediment loading, reducing phosphorus inputs and scavenging nutrients.

There is a great need in Walsh County to demonstrate the use of soil conservation and soil health BMPs on cropland areas to reduce NPS pollution. The SCD will continue to work with crop producers to develop improved management practices, such as cover crop, no-till, and strip till planting in areas with soil erosion and runoff. Currently, the PRWP has a demonstration site setup with the Soil Health Team, which is responsible for guiding the project. This demonstration project is a collaboration of partners from NRCS, NDSU Extension, SCD Board of Supervisors, General Mills and other sponsors. The project is contracted with producers through 2023 and demonstrates how strip-till and no-till can be used in sugarbeet production.

The PRWP will have met its goals when Homme Dam can maintain the fully supporting status of the aquatic life and recreational uses. This restoration will take place by reducing the annual phosphorus loading to the reservoir by forty percent. Therefore, the maximum allowable load target is 8,996.4 kg/yr. The end target concentration for chlorophyll-a in the reservoir should be maintained at 16 µg/L, and corresponds to a chlorophyll-a TSI score of 58.3. This change means that the lake is taken out of a Hypereutrophic status and labeled as Eutrophic, which allows better support for aquatic life as well as increasing the overall recreational use quality.

3.0 PROJECT DESCRIPTION

3.1 The main goal of the project is to reduce phosphorus loading into Homme Dam to restore beneficial uses of recreation and fish and aquatic biota, and reduce the occurrence of harmful algae blooms (HABs). In addition, impaired beneficial uses of fish and aquatic biota in the North, Middle, and South Branches of the Park River Watershed will be addressed by working in riparian areas and using cropland BMPs to decrease NPS pollution by nitrogen, phosphorus, and sediment.

3.2

Objective 1- Establish a network of collaborators to participate in the planning, prioritization, and implementation of watershed restoration activities to achieve water quality goals.

Task 1: Employ one full-time project coordinator and half-time project technician to build relationships with landowners, council landowners using PTMApp, implement project tasks, and develop plans for future priority initiatives addressing NPS pollution concerns.

Across Eastern North Dakota, NDSU 2015.

[9] The Walsh County Soil Health Team is comprised of the County Extension, NRCS, and Soil Conservation District Board and Staff including the watershed coordinator.

Product: One full time project coordinator and one half time project technician focused on project development, watershed plan development and BMP implementation.
Cost: $ 352,452

Task 2: Coordinate with other organizations, agencies, and stakeholders as needed to obtain additional technical and financial assistance to implement current and future projects addressing water quality and NPS pollution concerns. Partnerships are further discussed in section 4.0 Coordination Plan.

Product: A variety of financial and technical resources will be available for planning and implementation of projects to reduce NPS pollution.
Cost: Costs covered in Task 1

Task 3: Organize a watershed stakeholder committee that emphasized producer input early on, but also includes affiliated organizations, agencies and stakeholders involved in the Park River Watershed and Homme Dam. The committee will bring open dialog on prioritization of work areas, and help to further develop watershed goals, future conservation efforts, stakeholder buy-in, and education of landowners through conservation demonstration sites.

Product: Park River Watershed Management Plan, including management of the Homme Dam watershed.
Cost: Costs covered in Task 1

Task 4: Management of the watershed program to meet expectations of project implementation, task completion, and the appropriations of Section 319 funds and local match.

Product: Monthly SCD meetings to review project activities and progress; annual evaluations of staff performance; ongoing project promotion; assist with outreach efforts; approve BMP cost share agreements; coordinate with project partners; provide support staff; and secure necessary matching funds.
Cost: Costs covered in Task 1

Objective 2- Maintain the chlorophyll-a concentrations in the reservoir at 16 µg/L by reducing the annual phosphorus loading to the reservoir by 40%. This equates to an annual phosphorus load capacity of 8,996.4 kg/yr.

Task 5: Work with livestock producers to develop improved grazing management systems as well as fencing systems and exclusion grazing. Coordinate with NDSU Extension Service livestock specialists and NRCS to address the need for additional grazing opportunities by incorporation rotations that include crop aftermath and/or cover crop incorporation into the grazing system.

Product: Implementation of BMP's (Best Management Practices) on range/pasture and riparian areas to improve and protect stream banks and water quality upstream of Homme Dam.
Cost: $ 19,000 (Additional funding will be applied for from potential grant sources: USDA Programs, including NRCS EQIP).

Task 6: Work with landowners to improve riparian areas by installing BMPs to reduce and capture sediment.

Product: Implementation of low-cost riparian vegetation and other approved BMPs.
Cost: $ 22,000 (Additional funding will be applied for from: ND Outdoor Heritage Funds, ND Game & Fish, NDDEQ, USDA Programs).

Task 7: Work with crop producers to develop improved management practices, such as cover crop, no-till planting, strip-till of sugar beets, grass buffers, and windbreaks in areas with soil erosion and runoff.

Product: Implementation of BMP's (Best Management Practices) in the watershed to improve water quality by lessening NPS runoff into ditches and streams. Coordinate with NRCS and NDSU Extension to plan cropland practices, including finding ways to help specialty crop farmers reduce soil erosion. In addition, we will work closely with NRCS to plan and fund BMPs.
Cost: $ 61,000 (Landowners will apply to USDA Programs (CSP, EQIP), Save Our Lakes, or other available funding source).

Objective 3- Increase producers, landowners, and the general public's understanding of the impacts of NPS pollution and the potential solutions to prevent or reduce NPS pollution.

Task 8: Demonstrate the use of soil conservation and soil health BMPs on cropland areas to reduce NPS pollution. Examples used on demonstration sites include the use of cover crops, no-till planting, and nutrient management for improving soil health, and reducing erosion and excess nutrients. Work will be completed in cooperation with NRCS, NDSU Extension, and SCD Board of Supervisors.

Product: Four Soil Health Demonstration sites– Each site includes 40 acres of no-till acres farmed for four years, with cover crop implemented after planting. Soil tests will be needed at the beginning and end of the four-year period and may include Solvita and/or Haney tests.
Cost: $6,500

Task 9: Coordinate with NDSU Extension and NRCS to conduct at least four workshops during the project period to discuss stream bank erosion, water quality issues, rotational and aftermath grazing, cover crops, riparian management, nutrient management, and no-till practices. If workshops are not feasible due to COVID restrictions, video recordings of presenters may be substituted.

Product: Four informative workshops targeted towards active farmers and landowners in the watershed, with emphasis of landowners upstream of Homme Dam in impaired reaches of the watershed.
Cost: $ 5,750 (Speaker fees, advertising, and printing costs of meeting materials)

Task 10: Utilize radio, newspaper articles, social media, direct mailings, Soil Conservation District newsletter, one-on-one contacts, etc., to disseminate information on conservation and management options using BMP's that can be used to improve water quality in the watershed. We will provide direct mailings to landowners in the PTMApp priority catchments or subwatersheds at least twice per year.

Product: Annual mail-out newsletters, possible radio spot talking about water issues and solutions, "Conservation Corner" newspaper column published in the Walsh County Record at least 5 times per year, one on one contact with producers.
Cost: $3,100 (Cost for the development and printing of material only).

Task 11: Work with Walsh County Schools to educate students about water quality issues and NPS. Continue to lead water quality seminars at the SCD's annual Eco-Ed Day, and participate in other opportunities for outreach to students. Involvement in agricultural or science classes in local school districts, as well as the local land judging team meetings are two examples of opportunities to provide specialized learning to students. Grafton, Park River, or Edinburg school districts would be schools in the project area.

Product: Hands on experience in the classroom in a minimum of one session per school in the project period, and annual participation in Eco-Ed Day in Walsh County.
Cost: $2,000 (Cost for the development and printing of educational materials and mileage).

Objective 4- As BMP are applied, document trends in water quality and beneficial use conditions (i.e., chlorophyll-a concentrations, chlorophyll-a TSI score and phosphorus loadings) to evaluate progress toward established goals. Also, track the type, location, amount, and costs of BMP applied with Section 319 cost share assistance.

Task 12: Coordinate with the NDDEQ to implement a Quality Assurance Project Plan (QAPP) to track in-lake trends in chlorophyll-a concentrations and annual phosphorous loading to the reservoir.

Product: Data collection as scheduled in the QAPP.
Cost: $900 (Cost for sampling, transport, and/or supplies).

Task 13: Maintain the NPS Program BMP Tracker database to document the type, location, cost and amount of BMP applied with Section 319 financial assistance.

Product: Record of all BMP implemented with Section 319 financial support
Cost: Costs covered in Task 1

3.3 See attached Milestone Table (Appendix 3).

3.4 All necessary permits for BMP implementation will be acquired. These may include CWA (Clean Water Act) Section 404 permits. Project sponsors will work with NDDEQ to determine if National Pollution Elimination System permits are needed for the proposed livestock systems. The project staff will also consult with the ND State Historic Preservation Officer to determine if the planned BMP will have an effect on cultural resources and if a cultural inventory is needed.

3.5 The Walsh County Three Rivers Soil Conservation District is the appropriate entity to coordinate and implement this project. The SCD is a locally elected conservation organization that serves all the people in the county. The sponsors will work with the North Dakota Department of Environmental Quality (NDDEQ) to determine the need for any environmental permits for livestock management systems.

3.6 The Walsh County Three Rivers SCD will be responsible for auditing Operation and Maintenance Agreements (O&M) of BMP cost shared with Section 319 funds during the project period. This will include yearly status reviews to evaluate the maintenance of the BMP and determine if any changes are needed to enhance or maintain the effectiveness of the BMP. The lifespan of each BMP will be listed in the individual contracts to ensure longevity of the practices. The producer signs the "EPA 319 Funding Agreement Provisions" form which explains in detail the consequences of destroying a BMP before the completion of its lifespan.

4.0 Coordination Plan

4.1

1) The Walsh Country Three Rivers Soil Conservation District will be the lead agency liable for project administration, conservation planning, technical assistance, educational campaign, clerical assistance, access to equipment and supplies, and annual financial support. The Park River Watershed Coordinator will serve as a liaison between watershed projects/producers and USDA program participation.

   The Park River Watershed Coordinator will work closely with the agency partners to streamline project planning to meet resource needs in the watershed. This collaboration can include technical planning efforts that incorporate best management practices (BMP's), drawing upon both coordinators' strengths to provide planning and project management in the project area.

   USDA Natural Resources Conservation Service (NRCS) and the Park River Watershed Coordinator will work to closely throughout the project to ensure landowners in the watershed are receiving needed planning assistance. NRCS will support the project by providing technical assistance, facilitating local involvement, participating in educational outreach programs during the project, and coordinating special initiatives together. NRCS will also provide cost-share assistance through the USDA conservation programs and will serve as participants on the Local Work Group. Staff will incorporate existing USDA programs (financial and technical) and target resources to enhance efforts within the watershed. Existing office space and office equipment use will be made available to the watershed coordinator. The Watershed Coordinator will be kept up to date on NRCS standards and provided appropriate technical training opportunities.

2) The NDDEQ will administer the Section 319 funding allocations and agreements with the Walsh County Three Rivers SCD and will also develop the necessary quality assurance project plans for lake and stream monitoring. The NDDEQ will also provide the appropriate training for proper water quality sample collection, preservation, and transportation. NDDEQ will continue to provide analytical support for water quality and HABs samples.

3) North Dakota State University Extension Service will assist in project information and education activities with the possibility of providing "in-kind" funds. Specialists will be asked to assist in tours and educational demonstrations. Specialists will also be solicited for assistance for landowners with complex resource needs.

4) North Dakota Game & Fish Department will be solicited for technical and financial assistance when needed. We look forward to collaborating with NDG&F's Save Our Lake

Program. We will consult with US Fish and Wildlife, US Army Corp of Engineers, Walsh County Water Resource District, and Walsh County Commission on projects affecting resources in the watershed. Financial and technical support will be requested from the above agencies on as needed project basis.

5) Other potential partners include the North Dakota Forest Service, Cavalier County Soil Conservation District, Pembina County Soil Conservation District, Walsh County Park Board, North Dakota Stockmen's Association, Ducks Unlimited, and City Commissioners. Additional funding sources may include the North Dakota Natural Resources Trust and the North Dakota Outdoor Heritage Fund.

4.2 Support for this project has been received from the Park River NRCS office, the Walsh County Extension Service, the Walsh County Commission, and landowners–several who are looking forward to utilizing the new program. In September 2017, the Park River Watershed Stakeholder survey providing us feedback on the need for the program, including the need for additional financial and technical assistance.

4.3 Several affiliates have programs and projects that would coincide with the Park River Watershed's goals. The NRCS's immediate pertinent programs such as wetland easements, Wetland Reserve Programs (WRE), and Environmental Quality Incentives Program (EQIP), especially the Red River Basin Initiative, will be utilized during the implementation of BMPs in the watershed. Also, the Conservation Reserve Program (CRP) will be an option provided by the local Farm Service Agency (FSA).

The North Dakota Forest Service offers financial support for tree plantings\renovations and will be considered an additional source of funding for specific BMP's such as riparian and windbreak plantings. The Walsh County Water Board issues funds and support to those in the county for water and stream issues and will be approached as a funding source on riparian projects.

4.4 The Walsh County Soil Health Team is working closely on the same resource concerns in the project area, however, collaboration has prevented the duplication of efforts. We have learned that time, money, and knowledge can be gathered through networking and collaboration with one another and partnering agencies. NRCS and County Extension have worked closely with both 319 coordinators, and that relationship is expected to continue. Continuing to strengthen collaboration efforts will only increase the success of our agencies and goals to reduce non-point source pollution (NPS). In 2019, both NRCS and Extension indicated the need to continue the watershed program, as well as the need to expand the project staff.

The team has a mutual understanding of how to best address resource concerns, and to date, collaboration has been primarily through educational workshops, press releases, and demonstration sites. Additional technical support will be sought from the resource team in project planning.

Evaluation and Monitoring Plan

5.0 The Quality Assurance Project Plan (QAPP) will be completed by NDDEQ by April 2021 and will provide protocols for water quality sampling in the watershed. A copy of the QAPP will be

available in the project office and can be obtained from the NDDEQ.

Because of generous efforts by agencies like NDDEQ, EPA, and NOAA to provide testing support, equipment and training to the local watershed coordinator, the coordinator is well prepared for future harmful blooms that may impact human and animal health. At the present time, the watershed coordinator is able to expedite the identification of toxin producing species like Aphanizominon, Microcystis, and Anabaena. Abraxis tests strips provide the coordinator fast preliminary toxin results, and samples are referred to a support lab contracted by NDDEQ. The public mostly relies on signage at Homme Dam to determine if the water is safe, and therefore, the coordinator has a key role in HABs testing and response in the watershed.

6.0 Budget

6.1 See Attachments (Appendix 2)

7.0 Public Involvement

7.1 The Park River Watershed Project will work closely with watershed stakeholders to provide them opportunity to contribute input on resource concerns, BMP priorization, education and outreach, and other watershed restoration efforts. Workshops and videos will allow for education on topics influencing water quality in the watershed.

Outreach at crop improvement association meetings, livestock improvement association meetings, the county fair, public schools, township meetings, county commission meetings and other local places of public gathering will allow information sharing to take place. Public outreach has been a strong point of the current Homme Dam Watershed Project and will continue into the next phase of the program.

Park River Watershed Implementation Plan

Appendices

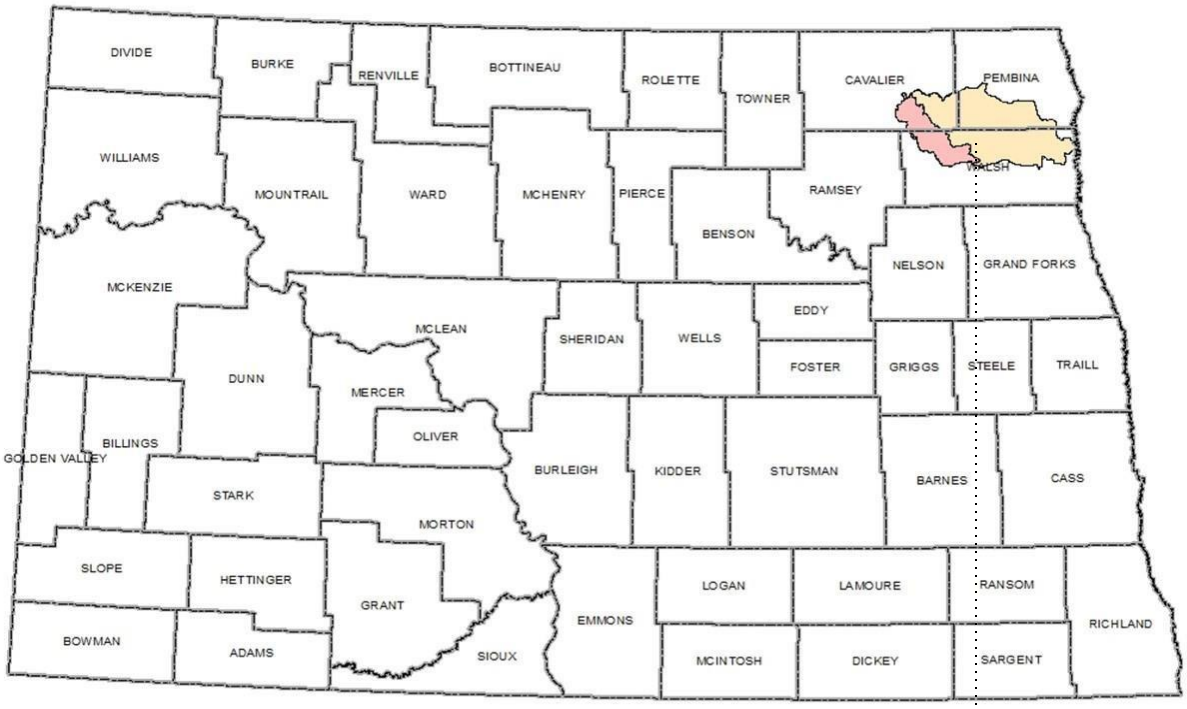
1. **Walsh County Maps**

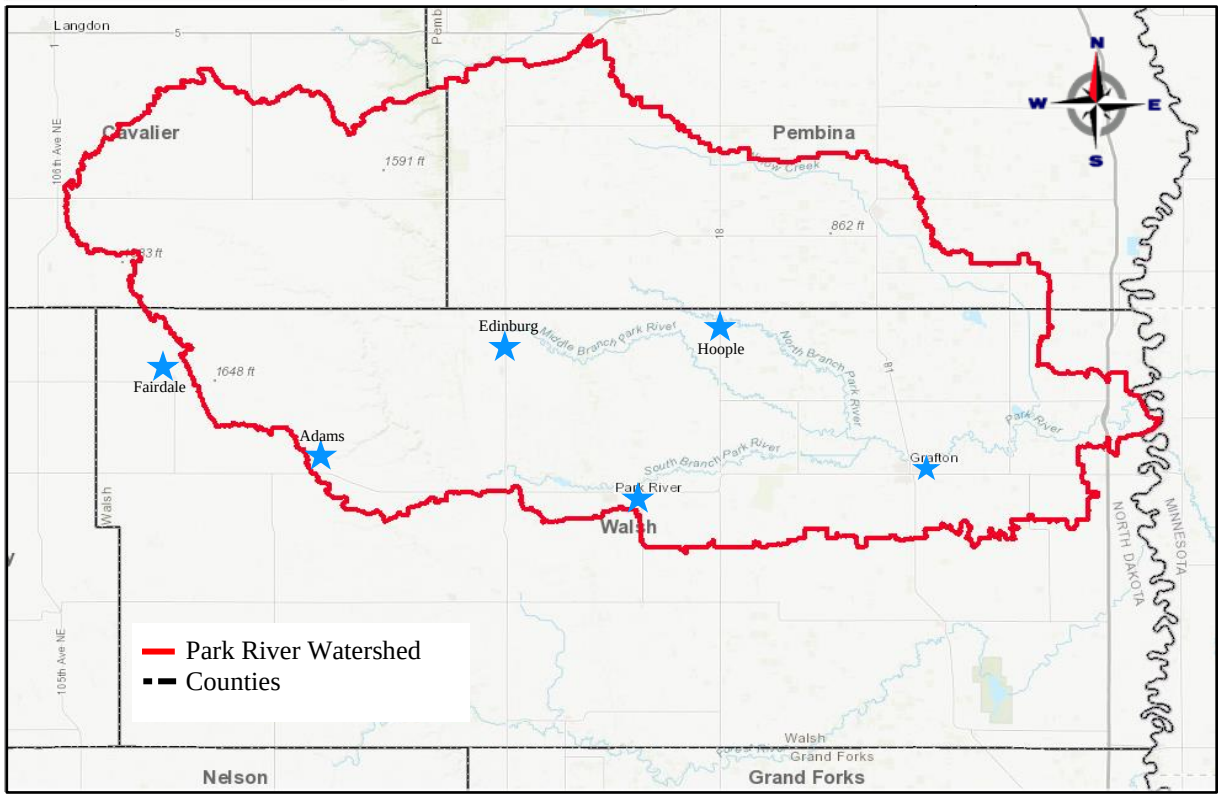
2. **Budget Tables**

3. **Milestone Table**

Appendix 1

Map of the Park River Watershed in North Dakota


DIVIDE
BURKE
RENVILLE
BOTTINEAU
ROLETTE
TOWNER
CAVALIER
PEMBINA
WILLIAMS
MOUNTRAIL
WARD
MCHENRY
PIERCE
RAMSEY
WALSH
BENSON
NELSON
GRAND FORKS
MCKENZIE
MCLEAN
SHERIDAN
WELLS
EDDY
FOSTER
GRIGGS
STEELE
TRAILL
DUNN
MERCER
OLIVER
BILLINGS
GOLDEN VALLEY
BURLEIGH
KIDDER
STUTSMAN
BARNES
CASS
STARK
MORTON
SLOPE
HETTINGER
GRANT
EMMONS
LOGAN
LAMOURE
RANSOM
RICHLAND
BOWMAN
ADAMS
SIOUX
MCINTOSH
DICKEY
SARGENT
Legend
Park River Watershed
Homme Dam Watershed


Langdon
Cavalier
Pembina
1591 ft
862 ft
1648 ft
Edinburg
Hoople
Fairdale
Adams
Grafton
Park River
Walsh
Nelson
Grand Forks
N
W
E
S
Park River Watershed
Counties

Appendix 2

Budget Tables

Part 1: Funding Sources						
	2021	2022	2023	2024	2025	Total
EPA SECTION 319 FUNDS						
1) FY 2021 Funds (FA)	$11,460	$75,451	$75,861	$79,124	$41,725	$283,621
STATE/LOCAL MATCH						
1) Walsh Co. Three Rivers SCD (TA & FA)	$2,440	$39,501	$40,974	$43,149	$22,217	$148,281
2) Landowners (FA)	$5,200	$10,800	$9,600	$9,600	$5,600	$40,800
3) NDDEQ (TA)	$4,000	$4,000	$4,000	$4,000	$4,000	$20,000
4) General Mills (FA)	$40,695	$30,303	$30,303	$0	$0	$101,300
Subtotals	$52,335	$84,603	$84,877	$56,749	$31,817	$310,381
TOTAL BUDGET	$63,795	$160,055	$160,738	$135,873	$73,542	$594,002
*OTHER FEDERAL FUNDS						
1) NRCS (TA, EQIP, CSP)	$206,000	$206,000	$206,000	$206,000	$206,000	$1,030,000
2) FSA (CRP)	$16,000	$16,000	$16,000	$16,000	$16,000	$80,000
TOTAL FEDERAL FUNDS	$222,000	$222,000	$222,000	$222,000	$222,000	$1,110,000
TOTAL PROJECT COST						$1,704,002

*Funding is subject to change due to current application enrollment.

FA: Financial Assistance
TA: Technical Assistance
SCD: Soil Conservation District
NRCS: Natural Resource Conservation Service
FSA: Farm Service Agency
NDDEQ: North Dakota Department of Environmental Quality

Part 2: Detailed Budget (Section 319/Non-Federal)								
	2021	2022	2023	2024	**2025	Total Costs	Cash and In-Kind Match	319 Funds
PERSONNEL/SUPPORT/ADMIN								
Salary/Fringe	*0	$83,652	$87,085	$90,658	$47,190	$308,585	$123,434	$185,151
Travel	$3,000	$750	$825	$1,000	$726	$6,301	$2,520	$3,781
Office Rent/Utilities	*0	$2,800	$2,900	$3,000	$1,500	$10,200	$4,080	$6,120
Equipment/Supplies	*0	$5,000	$5,000	$5,000	$2,500	$17,500	$7,000	$10,500
Training	$1,700	$750	$825	$815	$726	$4,816	$1,926	$2,890
Communications (Telephone/Postage)	*0	$1,400	$1,400	$1,500	$750	$5,050	$2,020	$3,030
Subtotals	$4,700	$94,352	$98,035	$101,973	$53,392	$352,452	$140,981	$211,471
Objective 2: Applying Grazing Management Practices								
BMPs for Cropland	$6,000	$15,000	$15,000	$15,000	$10,000	$61,000	$24,400	$36,600
BMPs for Rangeland	$6,000	$6,000	$3,000	$3,000	$1,000	$19,000	$7,600	$11,400
BMPs for Riparian	$1,000	$6,000	$6,000	$6,000	$3,000	$22,000	$8,800	$13,200
Subtotals	$13,000	$27,000	$24,000	$24,000	$14,000	$102,000	$40,800	$61,200
Objective 3: Information/Education								
Public meetings/Workshops/Tours/Education	*0	$1,000	$1,000	$2,500	$1,250	$5,750	$2,300	$3,450
Newsletters/News releases/Videos	$1,200	$1,200	$1,200	$1,200	$300	$5,100	$2,040	$3,060
Soil Health/No-till Demonstration Sites	*0	$2,000	$2,000	$2,000	$500	$6,500	$2,600	$3,900
Subtotals	$1,200	$4,200	$4,200	$5,700	$2,050	$17,350	$6,940	$10,410
Objective 4: Water Quality Monitoring								
Sampling/Transport/Supplies	$200	$200	$200	$200	$100	$900	$360	$540
Subtotals	$200	$200	$200	$200	$100	$900	$360	$540
Total for all Objectives/Tasks								
Total 319/Non-federal Budget	$19,100	$125,752	$126,435	$131,873	$69,542	$472,702	$189,081	$283,621

** Funding for 2025 is only from January 1st through June 30th.

* Line item already covered in existing 319 Grant.

Part 3: Projected BMP List		
Practice Code	Practice Description	Cost per unit
340	Cover Crop	$20/ acre
378	Pond	Engineer Est.
380	Windbreak/Shelterbelt Establishment	$30/hlnft
382	Fencing (Barbed)	$1.80/ ft
382	Fencing (2 wire electric)	$0.95/ft
382	Fencing (single wire electric)	$0.90/ft
386	Field Border	$20/acre
390	Riparian Herbaceous Cover	$300/acre
391	Riparian Forest Buffer	$350/acre
393	Filter Strip	$125/acre
422	Hedgerow Planting	$20/hlnft
472	Access Control/Use Exclusion (Livestock)	$20/acre
512	Pasture & Hayland Planting	$52/acre
516	Pipelines	$3.15/ft
528A	Prescribed Grazing	$5/acre
550	Range Planting	$40/acre
590	Nutrient Management (Advanced Precision only)	$27/acre
601	Vegetative Buffer	$125/acre
610	Salinity & Sodic Soil Management	$20/acre
614	Trough and Tank	Local Rate

- Additional BMPs will be implemented as needed in accordance with Section 319 guidelines

Appendix 3

Milestone Table

Milestone Table: Park River Watershed Project			2021	2022	2023	2024	2025
Task/Responsible Organization	**Output**	**Total Qty**	**Qty**	**Qty**	**Qty**	**Qty**	**Qty**
OBJECTIVE 1-establish support network							
Task 1- Employ Project Staff Group 3	- Watershed Coordinator (FT) - Watershed Technician (PT)	1 0.5	X X	X X	X X	X X	X X
Task 2- Coordinate with other organizations Groups 1,3,4,5,6	Financial/technical assistance	1	X	X	X	X	X
Task 3- Conduct meeting with affiliates Groups 1,2,3,4,5,6	- Long term watershed committee meetings - Management Plan	5 1	1 X	1 X	1 X	1 X	1 1
Task 4- Manage 319 funds and project Groups 3,4	Project implementation (years)	5	1	1	1	1	1
OBJECTIVE 2-reduce phosphorous load							
Task 5- Work with livestock producers Groups 1,2,3,5	BMP Implementation (plans)	3	X	X	X	X	X
Task 6- Work with crop producers Groups 1,2,3,5	BMP Implementation (plans)	3	X	X	X	X	X
OBJECTIVE 3- increase public understanding							
Task 7- Creative BMP demonstration sites Groups 1,3,5	Soil Health sites	4	X	X	X	X	X
Task 8- Conduct workshops on water quality Groups 1,3,5	Workshops	5	1	1	1	1	1
Task 9- Relay information via radio, newspapers, social media, etc. Group 3	Newspaper column, advertisements, online videos	22	2	5	5	5	5
Task 10-Education and outreach in schools Groups 1,3,5	Classes in schools and Eco-Ed	5	2	2	1	1	1
OBJECTIVE 4- document trends in water quality							
Task 11- Implement a QAPP Groups 3,4	QAPP	1	1	X	X	X	X
Task 12- Maintain NPS program BMP tracker database Group 3	Record of BMPs	1	X	X	X	X	X

Group 1- Natural Resources Conservation Service- Provide technical assistance to plan, design and implement BMPs.

Group 2- Landowners in the Park River Watershed- Make land management decisions and provide cash and in-kind match for BMPs.

Group 3- Walsh Co. Three Rivers SCD- Local project manager and sponsor, project coordination, administration of project funds, and progress reporting to the NDDEQ.

Group 4- North Dakota Department of Environmental Quality- Statewide Section 319 program management including oversight of local 319 planning and expenditures.

Group 5- NDSU Extension Service- Provides technical and financial or "In-kind" assistance for the project.

Group 6- Walsh County Water Resource District - Participation in watershed planning efforts.