PROJECT SUMMARY SHEET

1.0 Project Title: Wild Rice River PTMApp Prioritization and Implementation Project Phase II

Lead Project Sponsor:

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State: North Dakota **Watershed:** Wild Rice River Watershed

Hydrologic Unit Code: 09020105

High Priority Watershed: Yes

PROJECT TYPE	WATERBODY TYPES	NPS CATEGORY
Watershed	Rivers, Streams, Wetlands	Agriculture

Project Location: The project area is located in Southeastern North Dakota, specifically within the Western Wild Rice 8-Digit Hydrologic Unit (HUC), 09020105. This HUC covers over 1.4 million acres and covers the majority of Sargent County, except for two small areas in the southwestern and northern parts of the county. The first phase of this project utilized water quality data and analysis to select the top five to seven 12-digit HUCs to pare down the project area of focus (Appendix A). This phase will continue to utilize the same methods to identify 40 – 50 priority catchments within the collection of 12-digit HUCs from Phase I and will continue to monitor water quality data to compare to PTMApp load reduction data as a measure of project success.

Summarization of Major Goals: The primary goal of this project is to promote and implement agricultural Best Management Practices (BMPs) to restore and maintain the recreational and aquatic life uses of the priority areas within the Western Wild Rice Watershed. Additional goals include the use of the Prioritize, Target, and Measure Application (PTMApp) from the International Water Institute (IWI) to isolate and prioritize 40 to 50 catchments within the 12-digit HUCs that are identified as the highest sources of nutrients and sediments, as well as assess

water quality management needs of waterbodies within the project area. The implementation of BMPs in the priority sub-watersheds will improve nutrient use efficiencies, reduce erosion and cropland runoff, and restore degraded riparian areas through the reduction of sediment, phosphorus, and nitrogen. This phase of the project will continue to monitor actual water quality data and implement the prioritization schedule developed in Phase I. The prioritization schedule was interpreted as a map and can be found in Appendix A, Figure A1.

Project Description: This watershed project will utilize comprehensive conservation planning, PTMApp, BMP implementation, monitoring and assessment, education events, and demonstration projects in the priority watersheds for the Western Wild Rice Watershed to reduce nonpoint source (NPS) pollution impacts to aquatic life and recreational uses. Emphasis will be placed on improving vegetative conditions, erosion control, and soil health management within the priority areas identified by PTMApp as being high nutrient or sediment sources.

FY 25 - 319 funds requested: $235,440.00 Match: $156,960.00

Other Federal Funds: $0.00

Total project cost: $392,400.00 319 Funded Full Time Personnel: 1.1

The main objectives are:

1. Utilize the PTMApp to identify the top 40 to 50 priority catchments for BMP implementation within the Phase I 12-digit HUCs to reduce the estimated loads for nutrients (N & P) and total suspended solids at the sub-watershed priority resource point.

2. Implement the long-term schedule developed in Phase I for addressing the identified nutrient and sediment sources in the priority catchments in each sub-watershed in the Western Wild Rice Watershed in Sargent County. This schedule may extend beyond 20 years.

3. Work with landowners within these areas to assess which acres on their operation are the biggest contributors to nutrient and sediment load. Then work to provide cost-share for the implementation of BMPs on those acres.

4. Document trends in water quality and beneficial use conditions (i.e., nutrient or sediment and E. coli bacteria concentrations, PTMApp estimated reduction models, etc.) as BMPs are applied to evaluate progress toward established goals.

5. Provide opportunities for producers, landowners, partner agencies, and the public to increase their understanding and awareness of NPS pollution related to agricultural production and the potential cropping options that can be used to slow water runoff,

enhance infiltration, and improve soil health to reduce the delivery of sediments and nutrients to rivers, lakes, and streams in the project area.

2.0 STATEMENT OF NEED

2.1 Project Reference: Watershed planning in Sargent County began in 1999, with the Wild Rice Watershed Restoration Action Strategy. This original program provided technical and financial assistance to reduce the effects of NPS pollution. Since then, the Wild Rice Soil Conservation District (WRSCD) has worked to protect and restore the natural, economic, and recreational value of the Wild Rice River through Section 319 funded NPS pollution management projects. In fact, the September 2017 edition of the North Dakota Department of Health newsletter highlighted the Wild Rice River Restoration and Riparian Project for its accomplishments in improving the water quality within the Shortfoot Creek sub-watershed (Appendix B). Other efforts under the previous grant projects included cover crops, critical area plantings, riparian herbaceous cover, tree plantings, protection of riparian acres, fence installation, well decommissioning, and septic system replacement. Tables detailing preferred practices, and the quantity of past applied practices can be found in appendix C.

The Wild Rice River PTMApp Prioritization and Implementation Project Phase II (WRRPPIP Phase II) will continue to be targeted toward practices that improve the vegetative conditions and management practices in the riparian corridor and lands immediately adjacent to the Wild Rice and its tributaries. In this watershed, excessive soil erosion is associated with intensive agricultural activity or frequent over land flooding due to heavy rain and abundant snowfall. These conditions are causing failing stream banks, scalloping, and fluvial erosion. In addition to erosion, E. coli levels are a concern throughout Sargent County. As several streams have been placed on the 303(d) impaired waters list due to their failure to meet recreational or aquatic use standards. Poor manure management and failing septic systems are potential sources contributing towards elevated E. coli levels.

Phase II of the Wild Rice River PTMApp Prioritization and Implementation Project will build on the actions of the first phase, continuing to work with PTMApp to focus BMPs in areas that will produce the greatest water quality improvements while also documenting and enacting a long-term plan for sub-watershed and catchment prioritization. The Wild Rice Soil Conservation District will use funding through the WRRPPIP Phase II to support the development and implementation of comprehensive conservation plans with producers in the priority 12-digit HUCs. These plans will address resource issues such as soil erosion, livestock grazing, riparian management and soil health. Practices and management changes implemented through the plans will restore and protect the recreational and aquatic life uses of the Wild Rice River and its tributaries.

In previous years, the WRSCD had made a strong effort to improve and update its digital presence through the district website and social media pages. The district also participates in a variety of in-person events, such as Eco-Ed Day, Harvest North Dakota, Tom Gibson school presentations, Ladies Ag, and field workshops around the county. Outreach continues to be a

valued practice in the 319 operations of Sargent County, and the district will keep providing educational outreach opportunities online and in-person throughout the effective period of the WRRPPIP Phase II.

The Wild Rice Soil Conservation District operates a high tunnel originally funded through a Natural Resources Conservation Service Grant in 2012. Over the years, the district high tunnel has served as a valuable outreach tool for urban conservation. The district has hosted events, trialed soil health practices, and even opened the tunnel to 4H students and master gardeners for volunteer hours. Sargent county is home to acres of cropland broken up by rural homesteads and small towns. In rural areas, gardening and growing season extension can provide necessary produce to community members. The district will continue to provide urban conservation education and assistance to community members online and in-person during the effective period of the WRRPPIP Phase II.

The Conservation Cropping Systems Project was a cooperative endeavor between the WRSCD and local landowners. It demonstrated new and innovative methods for implementing the five principles of soil health: armor, minimizing disturbance, plant diversity, continuous plant or root, and livestock integration. This project was a valuable source of outreach and education in the project area, and taught producers different cropping and grazing options that can be implemented to improve water quality by keeping more residue on the soil surface, utilizing cover crops, and increasing water infiltration into the soil. The project has since been completed, and the cooperative sites closed, but the district has left itself open to potential opportunities for reopening the project should a new cooperator or opportunity arise.

2.2 Watershed Description: The Wild Rice River watershed is located in southeastern North Dakota within Cass, Dickey, Ransom, Richland and Sargent Counties as well as the counties of Marshal and Roberts in northeastern South Dakota. The Wild Rice River watershed lies within the Level III Northern Glaciated Plains (46) and Lake Agassiz Plain (48) Ecoregions. The Wild Rice River (HUC09020105) is identified as a Class II stream. The quality of the waters in this class shall be the same as the quality of class I streams, except that additional treatment may be required to meet the drinking water requirements of the Department of Environmental Quality. Streams in this classification may be intermittent in nature which would make these waters of limited value for beneficial uses such as municipal water, fish life, and irrigation, bathing, or swimming.

The Wild Rice River PTMApp Prioritization and Implementation Project Phase II will continue to utilize a mapping system from the International Water Institute called the PTMApp to prioritize areas likely to contribute the highest nutrient loads due to soil type, topography, and land use.

2.3 Maps: The Prioritize, Target, and Measure Application will be utilized to understand and address nutrient and sediment loads in the 12-digit HUCs in the Western Wild Rice Watershed. An example of a PTMApp map is shown in Appendix D, Figure D1, in which all the priority catchments for nitrogen management of the Western Wild Rice are delineated. The catchments range in size from 40 to 120 acres and are prioritized by the estimated amount of nitrogen

existing within them. The shade of red denotes the potential nitrogen output, the darker the red the higher the potential. In Appendix D, Figure D2, the nitrogen reduction is depicted based on catchments draining to a specific point, Sprague Lake. This lake was chosen as an example due to its location within the priority one region identified in Phase I (Figure A1). In the initial phase of WRRPPIP, 12-digit HUCs were evaluated and prioritized in 10-digit HUC groups based on the estimated levels of nitrogen, phosphorous, and sediment pollution (Appendix A, Figure A1). Moving forward, these sub-watersheds will be evaluated at the catchment level to further pinpoint conservation efforts. This task began in the first phase of WRRPPIP and will be built upon in the second phase with the goal of creating a means of prioritizing conservation efforts in the catchments for the foreseeable future. Ultimately, this process will allow the project to target 12-digit HUCs that will deliver the best results in terms of pollution reduction.

2.4 General Watershed Information: The Western Wild Rice River watershed is over 1.4 million acres in size and the river itself originates in Sargent County where it encompasses a majority of the county (see Appendix E, Figure E1). The climate is sub-humid characterized by warm summers with frequent hot days and occasional cool days. Average temperatures are 12º F in winter and 60º F in summer, though temperatures may go as low as -25º F and as high as 85º F. Precipitation occurs primarily during the warm period and is normally heavy in later spring and early summer. Average total annual precipitation is about 20 inches (NDAWN, 2024).

The Western Wild Rice River is characterized by highly fertile upland soils, primarily used for row crop, small grain, and livestock production. According to the Sargent County Soil Survey, the predominant soils in the watershed are Forman - Aastad loam. These soils are formed on slopes of 3 to 6 percent and are deep, medium textured, well to moderately well drained, very fertile, and possess high moisture holding capabilities. Typically, Forman - Aastad loams are resistant to wind erosion but moderately susceptible to water erosion. Land use within the tributaries is approximately 95 percent agriculture with 55 percent being actively cultivated.

The Wild Rice River as well as its tributaries and connected lakes are classified by the North Dakota Department of Environmental Quality as a warm water fishery, this classification is noted as "waters capable of supporting growth and propagation of warm water fishes (e.g., largemouth bass and bluegill) and associated aquatic biota" (NDDEQ, 2019). Approximately 24 fish species are found in the Wild Rice River Watershed, offering recreation for local fisherman, particularly in the lower reaches of the river. In 1995, NDDEQ conducted test netting of the Wild Rice River and documented the following species: Northern Pike, Walleye, White Sucker, Shorthead, Redhorse, Quillback, Black Bullhead, Tadpole Madtom, Carp, Fathead Minnow, Spotfin Shiner, Common Shiner, and Iowa Darter.

2.5 Watershed Water Quality:

2.5.1 Background and Overview: The Wild Rice River is a tributary to the Red River of the North. It is located in Cass, Dickey, Ransom, Richland, and Sargent counties in southeastern North Dakota and the counties of Marshall and Roberts in northeastern South Dakota. The Wild Rice River sub-basin (HUC 09020105) has an aerial extent of approximately 1.4 million acres. The Wild Rice River PTMApp Prioritization and Implementation Project Phase II will focus on

comprehensive conservation planning at the field scale, BMP implementation, monitoring/assessment, and information/education to reduce NPS pollution impacts to aquatic life and recreational uses in the watershed.

The primary causes of aquatic life use impairment are habitat degradation and fine sediment deposition. Macrophytes, or small aquatic plants, may also be negatively impacted by the elevated nutrient concentrations in the tributaries. Degraded riparian vegetation, reduced riparian corridor width, unstable streambanks, and eroding cropland are the likely sources of the fine sediment deposition impacting aquatic life uses.

In addition to the impaired aquatic life use, water quality in the Wild Rice River is impacted by E. coli concentrations, and the levels of nitrogen, phosphorous, and sediments. Over utilization of the riparian corridor for livestock grazing destabilizes streambanks, reduces vegetative buffering capabilities, and increases E. coli bacteria concentrations in the river. These conditions allow for runoff and erosion, leading to NPS pollution and sedimentation. Nitrogen, phosphorus, and sediment will be the primary NPS pollutant addressed by the project. E. coli bacteria concentrations will be addressed through the practices focused on improving livestock grazing management in the riparian areas. Financial and technical assistance delivered by the project will be targeted toward the priority areas identified with PTMApp. Within these areas, emphasis will be placed on improving nutrient use efficiencies, soil health, riparian conditions, and livestock grazing.

2.5.2 Water Quality Data: The section of mainstem Wild Rice River in Sargent County has five (5) STORET sampling sites. One of the five sampling sites was changed in 2024 due to a road washout leading to inaccessibility. These five sites were used to compile water quality trends over the 2022 to 2024 timeframe.

Three water quality indicators were analyzed: total nitrogen (TN), total phosphorous (TP), and total suspended solids (TSS). All three were measured as mg/l. These indicators were graphed separately for each sampling location to allow staff to observe trends or changes over time in the NPS pollution concentrations. Macroinvertebrate sampling took place in the watershed in 2023, results are expected in 2025 and will eventually be included in WRRPPIP Phase II annual reports. According to the macroinvertebrate Index of Biological Integrity (IBI) scores determined by the NDDEQ during previous grant periods, the Wild Rice River is not supporting aquatic life uses. The macroinvertebrate IBI scores ranged from 36 to 55. These IBI scores all fall in the 59-0 and 58-0 ecoregion IBI scoring ranges for the Wild Rice River watershed. IBI scores below 59 are assigned to the “Most Disturbed” biological condition class and “Not Supporting” status for aquatic life.

All pollutant graphs include a thick black line indicating the predetermined standard (or benchmark) for each type of pollutant. The standards or benchmarks for E. coli, TSS, TN, and TP can be found in Appendix E, Table E1. All figures depicting pollutant concentrations can be found in Appendix E. North Dakota does not currently have numeric water quality standards for the TSS, TN, and TP, when the data was processed an ecoregion guideline or target was defined

specifically for the WRRPPIP Phase I and II. Figures and data for this project plan were taken from the September 2024 Water Quality Summary generated by the NDDEQ.

2.5.3 Conclusions:

E. coli Bacteria: *E. coli* concentrations are represented by a monthly geometric mean of less than or equal to 126 colony forming units (CFUs) due to the variability of stream concentrations. In Figure E2, the data is shown as a line graph across the months of May to September averaged over the years of data (Appendix E). *E. coli* sampling takes place during the recreational season of May through September, as the bacteria can be considered a health hazard when entering the water. All five sites exceed 126 CFU at least once during the sampling period, with Shortfoot Creek (384037) exceeding the laboratory detection (24,000 CFU) limit in multiple instances. High concentrations were observed in four of the five sites. Statistical analysis was not conducted, however, visible seasonal trends for each site include increasing from May to September (385234/385447,380006, 384038), decreasing from May to September (384200), and peaking in midsummer (384037). Across the three years of data 380006, 384037, and 385234/385447 displayed decreases in concentration and 384200 and 384038 increased in concentration.

Total Suspended Solids: Four of the five sites exceed the TSS target value and were highest in the most downstream site (385234/385447), which also displayed an increasing trend in concentration over the three years. The Crooked Creek sampling site (384038) also showed an increasing trend in concentration, though at a much smaller scale and with all samples testing below the standard target value. The remaining three sample sites (384200, 384037, 380006) contained concentrations around the target value with decreasing or marginally decreasing trends (Tables E5 and E6, Figure E3). Previous projects in the Wild Rice found that TSS levels persisted throughout the summer and increased further downstream, suggesting continuous contribution of sediment throughout the length of the stream. This finding is supported by the most recent data, as the furthest downstream sampling point (385234/385447) contained the highest TSS concentrations.

Total Nitrogen: In the proposal for the initial phase of WRRPPIP, nitrogen concentration increases were attributed to major rain fall events and snowmelt run off. Nitrogen is highly water soluble, and water is the primary means of transporting nitrogen across the landscape to the streams. Concentrations of total nitrogen increased over the data collection period in four of the five sites and was highest in the Wild Rice – Legal Drain site (384200). Interestingly, the site with the highest concentration (384200) was the only site to display a decreasing trend across the three years (Tables E7 and E8, Figure E4).

Total Phosphorous: All five sites exceed the benchmark for total phosphorous. Crooked Creek (384038) displayed the highest concentrations, with no samples below or at the target concentration. In fact, all sites contained concentrations above the target concentration except for Wild Rice – Legal Drain (384200). Despite high concentrations of total phosphorus being found at nearly all sampling sites, all five revealed a decreasing trend in concentration over the three years of data collection (Tables E9 and E10, Figure E5). Previous data analysis in the Wild Rice

River noted that total phosphorous may be attributed to eroding streambanks as well as surface runoff, due to duration of TP concentration spikes seen in the previous project's data.

In conclusion: Beneficial uses in the watershed can be improved over the long-term by reducing average annual nutrient and TSS concentrations. These practices can be supported and encouraged through technical and financial assistance throughout the watershed. Progress toward a goal such as this can be slow but can be tracked over time by evaluating macroinvertebrate IBI scores and trends in average annual concentrations for *E. coli*, TN, TP, and TSS. The macroinvertebrate chemical stressor thresholds for nitrogen and phosphorus (i.e., 1.047 mg/l and 0.215 mg/l) and the TSS target concentration (i.e., 35 mg/l) can be used to evaluate BMP success in reducing impacts to aquatic habitats. Ultimately, attainment of the aquatic life use restoration goal will be based on the prolonged maintenance of IBI macroinvertebrate scores above 60, which translates to an aquatic life use support status of "Fully Supporting but Threatened."

3.0 PROJECT DESCRIPTION

3.1 Goal for the Project: The long-term goal of the project is to restore and protect the recreational and aquatic life use of the Wild Rice River in Sargent County by reducing the nitrogen, phosphorus and sediment mean annual concentrations. For this secondary phase, the goal is to continue to verify the effectiveness of the PTMApp model in establishing priority catchment areas through the estimated nitrogen, phosphorus and sediment loadings associated with applied practices in the identified priority sub-watersheds (e.g., 12-digit HUCs). The estimated PTMApp load reductions from applied BMPs will be used to evaluate if the chemical stressor threshold concentrations for nitrogen and phosphorus and the target value for TSS are reached at each sub-watershed priority resource point (Table E1). During this phase, progress towards the long-term goal will be accomplished by completing the tasks listed below.

3.2 Objectives and Tasks

Objective 1: Utilize the PTMApp to identify the top 40 to 50 priority catchments for BMP implementation within the Phase I 12-digit HUCs to reduce the estimated loads for nutrients (N & P) and total suspended solids at the sub-watershed priority resource point.

Task 1.1: The Wild Rice Soil Conservation District will employ personnel to manage the project during the grant period.

Product: 1 Full-Time Watershed Coordinator and 0.1 Full-Time Office Coordinator

Cost: $313,500

Task 1.2: Utilize PTMApp to identify priority catchments for BMP implementation within the previously identified HUC12s.

Product: Work with the International Water Institute to identify priority catchments within each sub-watershed that has the highest potential contribution of nutrients and sediments

at the priority resource point. Maps and a long-term schedule will be documented during this time.

Cost: Staffing cost (Task 1)

Task 1.3: Utilize the "Scenario Builder" in PTMApp to determine the amount of additional BMPs needed to achieve the estimated nitrogen, phosphorous, and total suspended solid load reduction targets for the priority areas.

Product: Location, types and amounts for the most cost-effective BMP still needed to achieve the N, P and TSS load reduction targets for the sub-watershed.

Cost: Staffing cost (Task 1)

Task 1.4: Solicit additional funding to support the remaining BMPs needed to achieve the load reduction targets for the sub-watershed.

Product: Additional cost share funds to be used to support remaining BMP needs identified with the PTMApp Scenario Builder

Cost: Staffing cost (Task 1)

Task 1.5: Communicate with landowners and producers located within the identified HUC12 regarding potential BMP implementation and document communication efforts alongside actual BMPs implementation at the HUC12 level.

Product: A database detailing the communication efforts, potential BMPs, and implemented BMPs organized by priority HUC12.

Cost: Staffing cost (Task 1)

Objective 2: Implement the long-term schedule developed in Phase I for addressing the identified nutrient and sediment sources in the priority catchments in each sub-watershed in the Western Wild Rice Watershed in Sargent County. Work with landowners within these areas to assess which acres on their operation are the biggest contributors of nutrient and sediment load. Then work to provide cost-share for the implementation of BMPs on those acres.

Task 2.1: Restore, protect, and maintain approximately 250 acres along the Wild Rice River and its tributaries by installing/maintaining easements and/or implementing BMP's such as grassed waterways, filter strips, and trees. Short term management agreements of 3-5 years or easements of 5-20 years can be created to establish and maintain vegetation on riparian areas.

Product: Riparian BMPs on 250 acres.

Cost: $50,000

Task 2.2: Assist landowners with the development and implementation of cropland management plans on 1,000 acres of priority cropland acres. The plans will include BMP's such as

conservation crop rotation, cover crops, nutrient management, residue management, and soil testing.

Product: Cropland Management BMPs on 1,000 acres.

Cost: $30,000

Task 2.3: Assist landowners with the development and implementation of grazing management plans. These BMP's may include fencing, pipelines, wells, spring development, prescribed grazing, solar pumps, tanks/troughs, portable windbreaks, and/or winter grazing plans on five grazing systems.

Product: Technical and financial assistance on Grazing Management BMPs on five grazing systems.

Cost: $20,000

Objective 3: Document trends in water quality and beneficial use conditions (i.e., nutrient or sediment and E. coli bacteria concentrations, PTMApp estimated reduction models, etc.) as BMPs are applied to evaluate progress toward established goals.

Task 3.1: Conduct water sampling each year during the grant period and compare collected data to estimated load reductions generated in PTMApp.

Product: Approximately 500 water samples sent into the NDDEQ each sampling season and documentation of data comparisons.

Cost: Staffing cost (Objective 1, Task 1)

Objective 4: Provide opportunities for producers, landowners, partner agencies, and the public to increase their understanding and awareness of NPS pollution related to agricultural production and the potential cropping options that can be used to slow water runoff, enhance infiltration, and improve soil health to reduce the delivery of sediments and nutrients to rivers, lakes, and streams in the project area.

Task 4.1: The Watershed Coordinator and the Soil Conservation District will host and present at a variety of events annually to educate all land users and age groups on Best Management Practices to improve soil health, protect water quality, and reduce soil erosion.

Product: 15 Outreach Events (Green Talks, Eco-Ed, Ladies Ag, Envirothon, etc.)

Cost: $1,500

Task 4.2: Host at least one outreach event at the high tunnel annually. Develop plan to address soil health concerns and best practices in reference to high tunnel gardening. Write annual reports concerning status, practices, and results of each gardening season.

Product: One annual high tunnel event, soil health improvements, produce, plan of operation, and an annual report.

Cost: $20,000

3.3 Milestone Table: Located in Appendix F.

3.4 Permits: All necessary permits will be acquired. This may include Clean Water Act Section 404 permits. Project sponsors will coordinate with the NDDEQ to determine if National Pollution Elimination System permits are needed for proposed livestock systems as the practices are brought to the attention of project sponsors.

3.5 Lead Project Sponsor: The Wild Rice Soil Conservation District is the lead sponsor and has sponsored four previous Section 319 watershed projects. The annual and long-range plans of the WRSCD assist in prioritization and guidance of field service staff. The Wild Rice Soil Conservation District has legal authorization to employ personnel and receive and expend funds. The district has a documented history of personnel management and addressing conservation issues for their constituency.

3.6 Operation and Maintenance: The Wild Rice Soil Conservation District will be responsible for auditing Operation and Maintenance for Section 319 cost-shared BMP through yearly status reviews of EPA Section 319 contracts. The lifespan of each BMP will be taken into consideration and listed in each individual contract to ensure accuracy and longevity of the practices. The producer signs the "EPA 319 Funding Agreement Provision" form which explains in detail the consequences of destroying a BMP before the completion of its lifespan. Any WRSCD Water Quality Easements will be filed with the County Office Recorder at the Sargent County Courthouse. The original documents will be held in a custody file at the WRSCD office.

4.0 COORDINATION PLAN

4.1a The Wild Rice Soil Conservation District signs the Section 319 contract and is the lead agency responsible for administration. They will provide office space, clerical assistance, access to equipment, and supplies as well as annual financial support. The WRSCD board will oversee implementation of the scheduled project activities and provide for staff time if feasible. The WRSCD board WRSCD will be the primary supervisors of the watershed coordinator and all Section 319 funded activities.

4.1b The Sargent County Water Resource Board will assist the WRSCD in the project as applicable.

4.1c The Sargent County Commission supports the mission of the Wild Rice Soil Conservation District and the goals of this project.

4.1d The Natural Resource Conservation Service (NRCS) had previously entered into a contribution agreement with the CCSP Farm of WRRPPIP Phase I. That agreement and project has since been completed. In reference to BMP implementation, producers will be encouraged to utilize NRCS programs in the instances that are outside of the watershed project area or include practices outside of section 319 cost-share. These programs include the Conservation

Stewardship Program, Wetland Reserve Program, and the Environmental Quality Incentive Program.

4.1e The North Dakota Department of Environmental Quality (NDDEQ) will oversee 319 funding as well as develop the Quality Assurance Project Plan (QAPP) for this project. The department will provide training for proper water quality sample collection, preservation, and transportation, to ensure reliable data is obtained. Additionally, they will provide oversight to ensure proper management and expenditure of Section 319 funds. The department will assist NRCS and WRSCD personnel in the review of operation and management requirements for Section 319 cost-shared BMPs.

4.1f The Farm Service Agency (FSA) maintains cost-share programs, such as the Conservation Reserve Program, that will be presented to producers in the instances where the practice falls outside of the watershed project area or Section 319 cost-share.

4.1g The North Dakota State University (NDSU) Extension and Research operates a local office within the district. Local and State personnel, as well as education materials, will be utilized to compliment or assist in informational and educational activities as necessary. This will include actions such as specific BMP publications and assistance in workshops and field tours. Their specific role will be dependent on the type of activities being implemented and the availability of staff and materials.

4.1h The United States Fish and Wildlife Service offers programs and technical assistance which will be pursued for project assistance as necessary.

4.1i Ducks Unlimited Incorporated provides programs that will be pursued for project assistance as necessary.

4.1j Pheasants Forever has received 319 funding through the North Dakota Department of Environmental Quality for their Precision Agriculture Program. The watershed coordinator will work with Pheasants Forever to deliver eligible BMPs through the Precision Agriculture Program.

4.1k The North Dakota Game and Fish Department (NDGF) has entered a cooperative agreement with the NDDEQ, supported by funding through Section 319 and the Outdoor Heritage Foundation. This program, called the Red River Basin Wildlife and Water Quality Enhancement Pilot Program, offers cost-share and technical assistance in establishing vegetation on marginally cooperative cropland acres. The Wild Rice Soil Conservation District has entered into this agreement as a cooperator, with the watershed coordinator providing assistance and guidance for producers seeking cost-share through the RRBWWQEPP.

4.2 Local Support: The WRSCD Board is comprised of county residents to represent concerns for the Sargent County community at large. In addition to the SCD board, local support is received from a multitude of businesses for the previous CCSP activities and outreach events. Whether it be goods and services or sponsoring a meal, the people of Sargent County are always open to helping the WRSCD and the 319 Project. Local support is a community characteristic

that the district takes great pride in and aims to continue receiving with this and future 319 projects.

4.3 Partnership: The Wild Rice Soil Conservation District will work with multiple partners (e.g., NRCS, other SCDs, FSA, NDSU Extension Service, NDGF, etc.) to increase awareness of solutions to water quality and NPS pollution issues in the area. This will be accomplished through educational events and demonstrations that focus on the benefits of various conservation practices. Coordination with partners will also enhance efforts to protect soil resources, improve air and water quality, expand fish and wildlife habitat, and improve cropland and rangeland management.

4.4 Similar Activities: Not Applicable

5.0 EVALUATION AND MONITORING PLAN

The North Dakota Department of Environmental Quality Watershed Management Program Programmatic Quality Assurance Project Plan (QAPP) details the general quality assurance/quality control (QA/QC) measures for water quality data collected under Section 319 funded projects. A Sampling and Analysis Plan (SAP) specifying sampling site locations, sampling frequency, and references to Standard Operating Procedures (SOP) for this project is included in Appendix G**.**

6.0 BUDGET

6.1 See Appendix H, the budget worksheet.

7.0 PUBLIC INVOLVEMENT

The proposed second phase of the WRRPPIP is the latest in a long line of Wild Rice Watershed programs. The past watershed projects generated public involvement in a variety of ways and were successful in doing so. The district is active in youth education, hosting an annual ECO-ED Day for sixth graders and participating in Harvest North Dakota and Envirothon. These activities are designed to spark an interest in natural resources conservation among teens and children. Public tours and demonstrations are held annually to inform the public on various conservation issues such as no-till farming, strip tillage, cover crops, and urban conservation. The continuation of WRRPPIP will be handled in a manner similar to past projects, and project staff feel that public involvement is a guarantee.

WORKS CITED

North Dakota Agricultural Weather Network (NDAWN). (2024). *Yearly Weather Data.* Retrieved October 1, 2024. https://ndawn.ndsu.nodak.edu/weather-data-yearly.html

North Dakota Department of Environmental Quality. (2019). *Chapter 33.1-16-02.1 Standards of Quality for Waters of the State.* https://ndlegis.gov/information/acdata/pdf/33.1-16-02.1.pdf

APPENDIX A. PTMAPP RESULTS FROM PHASE I

During WRRPPIP Phase I, PTMApp was used to generate an order of importance for the 12-digit HUCs in the project area. A map containing the resulting order of 10-digit HUCs containing the 12-digit HUCs is found below in Figure A1. Additionally, a function of PTMApp is the creation of an "Action Report", which allows users to generate tables containing location and BMP specific load reduction and cost information calculated by the web application. Figure A2 depicts an action report for Location Point 27. Additional action reports may be generated for relevant location points during Phase II and will be included in the annual reports.

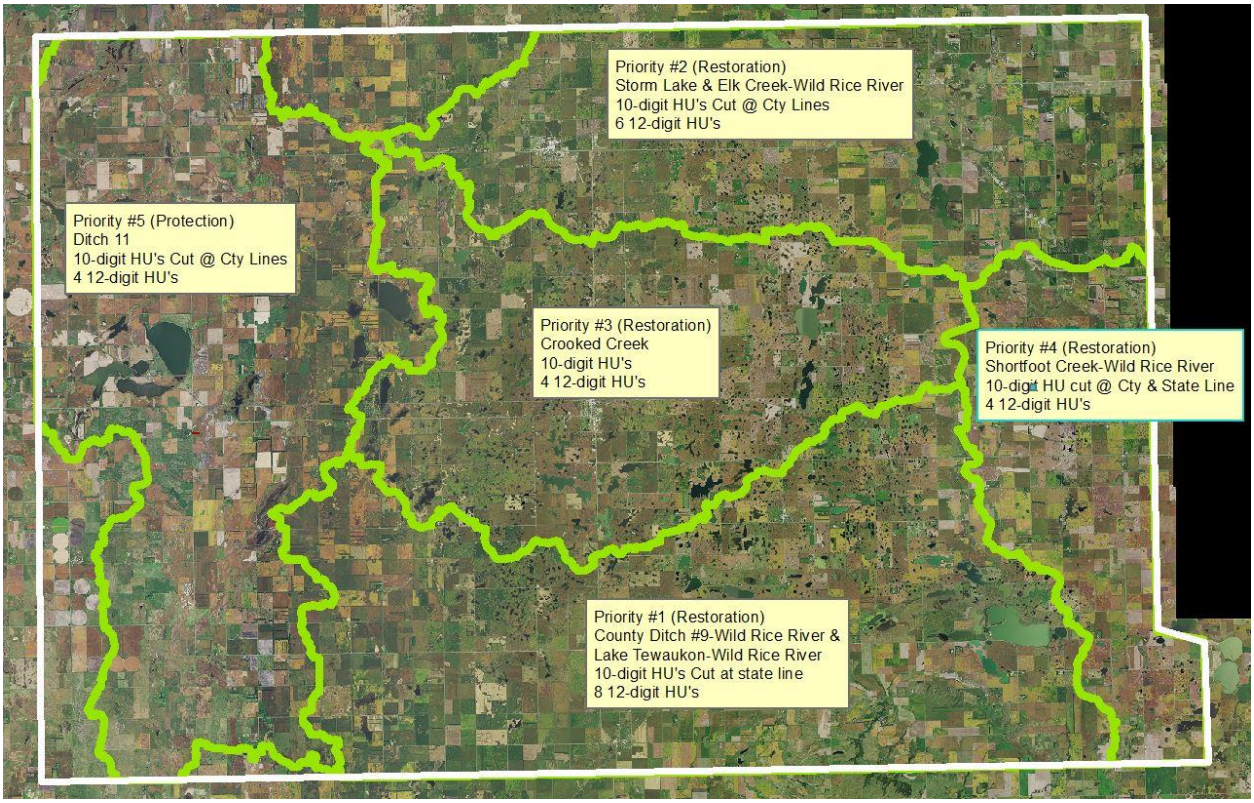


Figure A1. The five 10-digit HUCs in Sargent County labeled with numerical priority depicting the prioritization schedule.

PTMApp-Web Targeted BMP Action Report

Report Details

PTMApp-Web User: Matthew Olson

Watershed: Wild Rice River (huc09020105)

Location Point Number: 27

Report Generation Date: 2020-09-03

Selection Criteria

Parameter: Total Nitrogen

Treatment Group(s): Source Reduction

Basis for Practice Selection: Load Reduction

Scale and Storm Event: Catchment Outlet, 10 - Year

Method Used to Select BMPs: Number of Highest Ranked BMPs

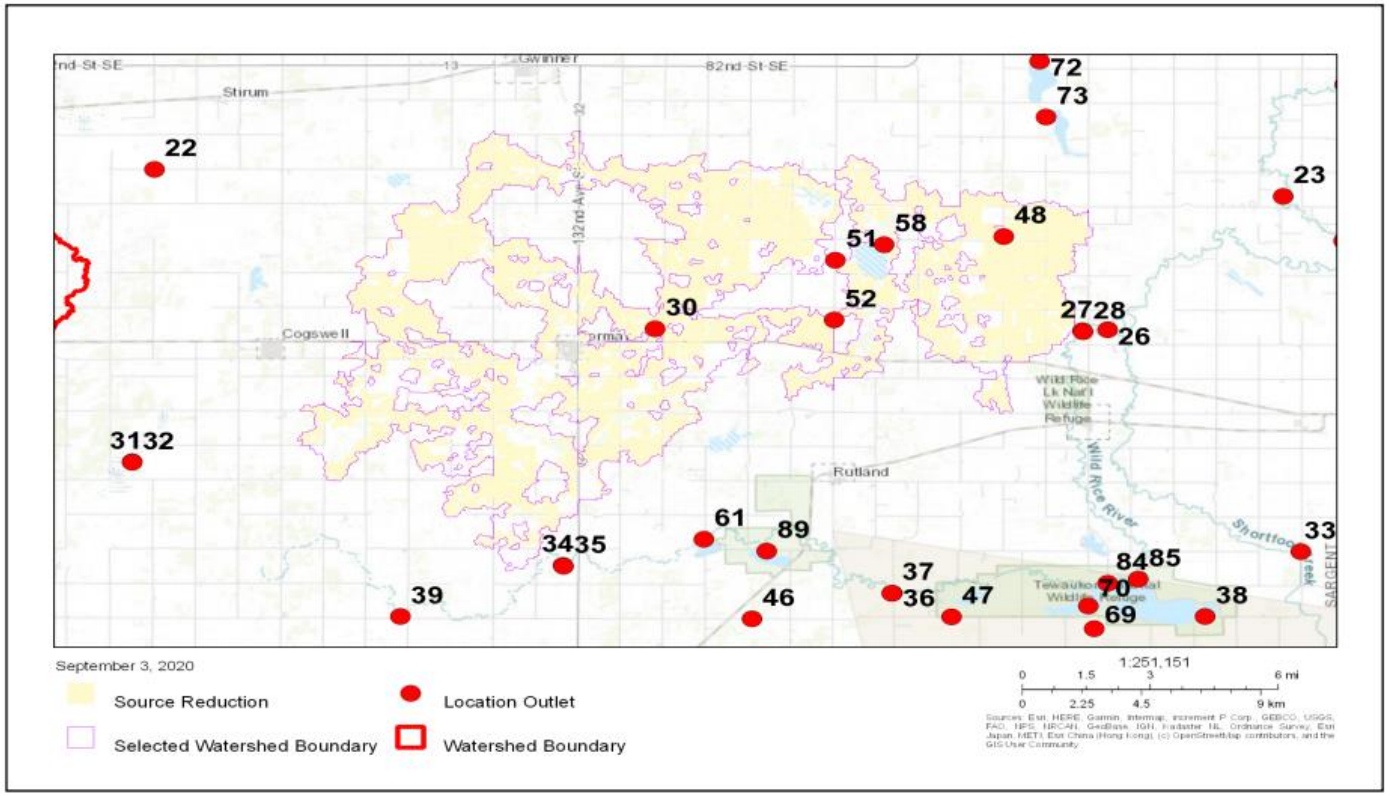


Figure A2. Best management practice targeted action report from Phase I.

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost ($)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment ($/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP ($/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN ($/lb)
Source Reduction	46742_590046_6	5,400,518	$3,812.74	39.97	$95.39	17.097	$223.01	136.95	$27.84
Source Reduction	54317_602412_6	5,314,676	$3,766.78	35.86	$105.03	16.818	$223.97	134.72	$27.96
Source Reduction	50719_597133_6	5,214,302	$3,614.21	24.80	$145.71	16.198	$223.12	129.75	$27.85
Source Reduction	54655_604779_6	5,399,980	$3,604.30	43.68	$82.52	16.135	$223.39	129.24	$27.89
Source Reduction	60022_613213_6	5,400,787	$3,595.72	31.29	$114.93	16.124	$223.00	129.16	$27.84
Grant Total from BMPs in Selection			**$18,394.00**	**175.60**		**82.372**		**659.83**	

Disclaimer: Practices shown are from raw results created using PTMApp-Desktop and uploaded to the web. Users should review actual locations for practicability to implement. Cost-Effectiveness values may vary slightly from actual calculation based on number of significant digits shown. The number of practices printed is based on selection criteria but is limited to 40, or up to 3 pages.

Figure A2. Best management practices targeted action report from Phase I (continued).

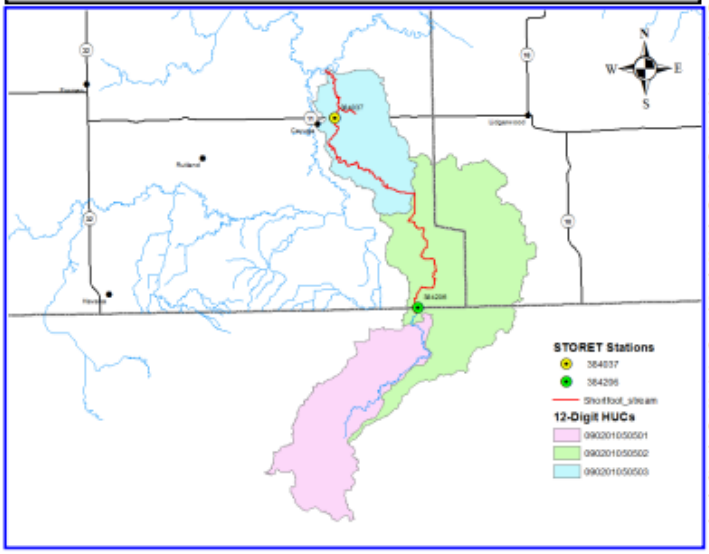
APPENDIX B. NORTH DAKOTA DEPARTMENT OF HEALTH SEPTEMBER 2017 NEWSLETTER

Our Water
Keeping it Clean

North Dakota Department of Health | Environmental Health Section

Shortfoot Creek: Improving Water Quality

by Jim Collins, Jr., Environmental Scientist, North Dakota Department of Health



Shortfoot Creek watershed, sampling (STORET) locations and associated sub-watersheds in southeastern North Dakota.

The Resource

Shortfoot Creek is a 55,203 acre watershed located in Sargent county in southeastern North Dakota and Marshall County in northeastern South Dakota. It is a sub-watershed of the larger Western Wild Rice River watershed.

The dominant land use on the North Dakota side of the Shortfoot Creek watershed is row crop agriculture. According to the National Agricultural Statistical Service (NASS, 2007a) land survey data, approximately 53 percent of the land is active cropland, 9 percent is wetlands, 6 percent water, 6 percent grassland, and 26 percent is in the Conservation Reserve Program (CRP), pasture, woods, or open space. The dominant land use on the South Dakota side of the Shortfoot Creek watershed is also row crop agriculture with 68.8 percent of the 9,814 acres of the watershed in corn (38.7 percent) and soybeans (31.1 percent) (NASS, 2007b). Another 6.1 percent is in other agricultural uses (e.g., small grains, alfalfa, and pastureland. The remaining acreage in the South Dakota portion of the watershed is wetlands (10.4 percent), grasslands (4.4 percent), and forest (2.1 percent).

Assessment and Focus

In 1999, the Wild Rice Soil Conservation District (SCD) along with the North Dakota Department of Health (NDDoH) developed a Watershed Restoration Action Strategy (WRAS) to improve water quality and land use conditions within the Wild Rice River watershed. In 2010, the Wild Rice SCD worked with the NDDoH to refocus its efforts on the Shortfoot Creek sub-watershed. From assessment data, the SCD was able to determine that the land use practices and potential sources of nonpoint source pollution (NPS) included: cropland erosion, degraded riparian areas and livestock concentration areas in close proximity to the river. Efforts to address these NPS pollution sources in Shortfoot Creek watershed were renewed again in 2014 and 2016.

The Goal

In 2014 and 2016, the project sponsors identified four major objectives that remained consistent with the original goal of restoring and maintaining the recreational use within the Shortfoot Creek watershed.

1. Target areas for reducing sediment. The naturally flat stream channels in the sub-watershed allow tillage and livestock grazing right to the water's edge, so the installation of long-term riparian and grass buffers will help prevent sediment, nutrient and E.coli bacteria from reaching the streams. Cost-sharing assistance for best management practices (BMPs) and technical assistance for long-term planning will help improve these areas.
2. Increase the index of biotic integrity (IBI) score for the specific reaches of the creek being addressed by the project to achieve a fair to good ranking

Figure B1. North Dakota Department of Health Newsletter highlighting the Wild Rice River Restoration and Riparian Project's success in Shortfoot Creek, page 1.

Livestock waste management containment pond and fencing.

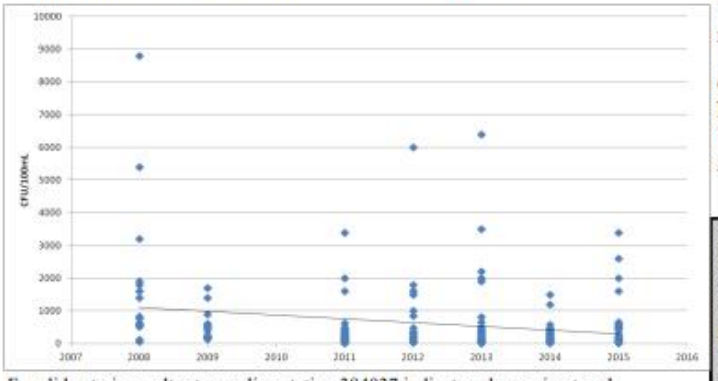
(59-70 for fair and >70 for good).

3. To evaluate progress, document trends in water quality and beneficial use conditions (e.g., nutrient/sediment and E. coli bacteria concentrations, riparian conditions, fish and macro invertebrate diversity, etc.) as BMPs are applied.
4. Provide opportunities for producers and the public to increase their understanding of (1) NPS pollution related to agricultural production and potential cropping options and (2) the importance of slowing water runoff and enhancing infiltration using management systems to reduce the delivery of sediments and nutrients to water bodies in southeastern North Dakota.

Restoration Efforts

The Wild Rice SCD has worked with local landowners to implement the following BMPs in the watershed:

Cover Crop	2906.34 Acres
Critical Area Planting	22.6 Acres
Fencing	12,331 Feet
Rural Water Hookup	1
Trough and Tank	8
Well (livestock only)	3
Manure Irrigation	1 System
Portable Windbreaks	584 Feet
Waste Utilization	2020 Tons
Well Decommission	3
Riparian Easement	474.80 Acres
Riparian Herb Cover	69.7 Acres
Pipeline	9917 Feet
Filter Strip	80.0 Acres
Pasture/Hay Planting	60.0 Acres



E. coli bacteria results at sampling station 384037 indicate a decreasing trend.

Results

Through the hard work of the SCD staff and cooperation of landowners to install BMPs in the sub-watershed, bacteria levels have started to show a decreasing trend according to sample results. While current levels still exceed state standards for recreation, project sponsors and the NDDoH are encouraged by the trend. It is possible that water quality in be improved enough in Shortfoot Creek for it to be removed from the 303(d) list of impaired waters.

Future Efforts

The SCD recently hired Matt Olson as the new watershed coordinator, replacing Trace Hanson who retired this past spring. Olson has an extensive background in working with producers to implement BMPs. With cost-share and technical assistance readily available, the key to continued project success will be producer interest throughout the watershed.

Questions?

For more information contact:

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Wild Rice SCD
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NPS Program Coordinator
701-328-5232
gsandnes@nd.gov

North Dakota Department of Health
Environmental Health Section
Gold Seal Center, 4th Floor
918 East Divide Ave.
Bismarck, N.D. 58501-1947
701.328.5150
www.ndhealth.gov

Figure B2. North Dakota Department of Health Newsletter highlighting the Wild Rice River Restoration and Riparian Project's success in Shortfoot Creek, page 2.

APPENDIX C. Wild Rice Watershed Best Management Practices

Table C1. The implemented or preferred best management practices in the past and current project areas.

Wild Rice River PTMApp Prioritization & Implementation Project Phase II BMP List	
19	Septic System Renovation
340	Cover Crops
342	Critical Area Planting
351	Well Decommissioning
380	Windbreak/Shelterbelt Establishment
382	Fencing
390	Riparian Herbaceous Cover
391	Riparian Forest Buffer
393	Filter Strip
412	Grassed Waterway
512	Pasture & Hay-land Planting
516	Pipeline
550	Range Planting
610	Salinity & Sodic Soil Management
614	Trough and Tank
638	Water & Sediment Control Basin
642	Well

Table C2. The amounts of applied past practices.

Past Best Management Practices (10/14/2014-2/16/2021)	Applied Amount
Septic System Renovation	2 systems
Riparian Easement (On Cropland)	218.85
Livestock Manure Mgmnt System (Irrigation)	1 system
Cover Crops	4,901.74
Critical Area Planting	27.6 ac
Well Decommissioning	4 wells
Windbreak/Shelterbelt Establishment	4,042 ln ft
Fencing	15,947.8 ft
Riparian Herbaceous Cover	204.18 ac
Pasture & Hayland Planting	60 ac
Trough and Tank	8 tanks
Past Outreach Events & Attendees (8/31/2017 - 2/16/2021)	**Applied Amount**
CCSP Field Days & presentations	946 attendees
Youth Education (Eco-Ed, Envirothon, etc.)	1117 attendees
Watershed & Urban Conservation Mtgs.	971 attendees

Table C3. The amounts of best management practices applied, specifically under Phase 1 (10/14/2014 – 6/14/2026), excluding outreach events.

Best Management Practice	Applied Amount
Trough & Tank	1 tank
Well Decommissioning	2 wells
Cover Crop	2,275.08 acres

APPENDIX D. PTMAPP EXAMPLE MAPS

Figure D1. Total Nitrogen Reduction at Catchment level for the Western Wild Rice River Watershed, generated using PTMApp.

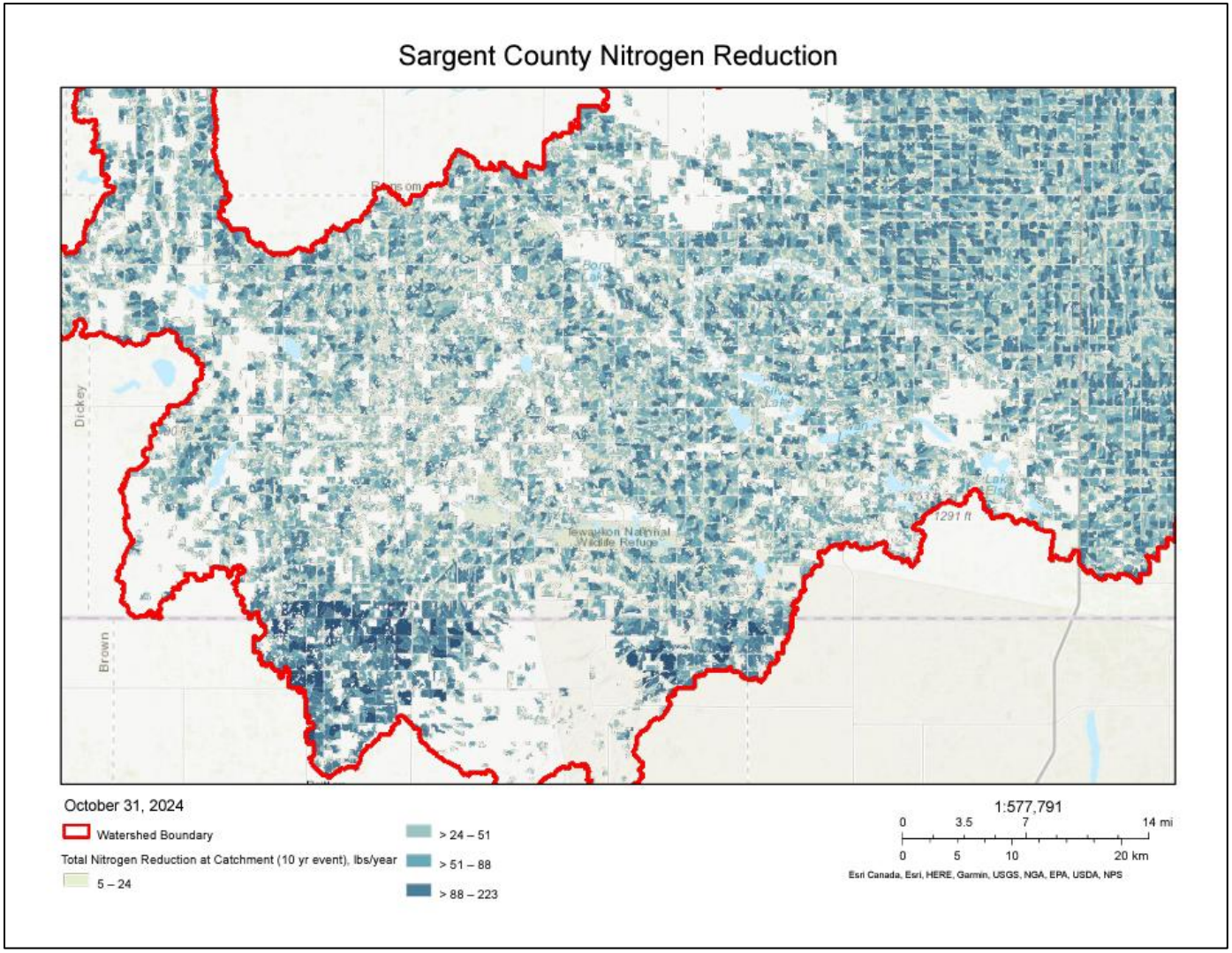
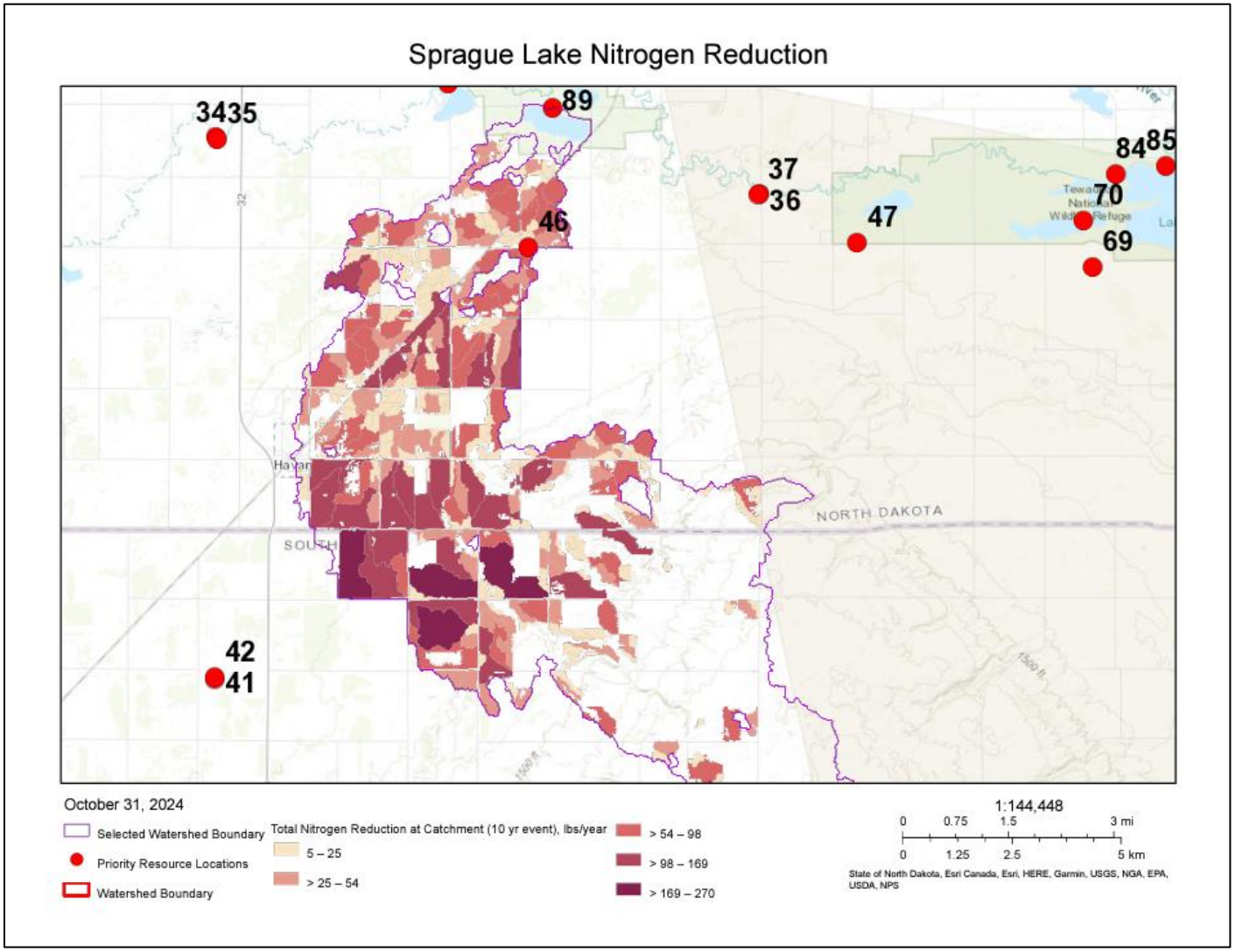


Figure D2. Total Nitrogen Reduction at Catchment Level for Sprague Lake, generated with PTMApp. This lake is found in the number one priority 10-digit HUC identified in Phase I.



APPENDIX E. WATER QUALITY DATA

The water quality data discussed in this plan was collected at five sampling sites throughout the watershed, samples were tested by the North Dakota Department of Environmental Quality (NDDEQ) and analyzed by Emily Joynt of the NDDEQ.

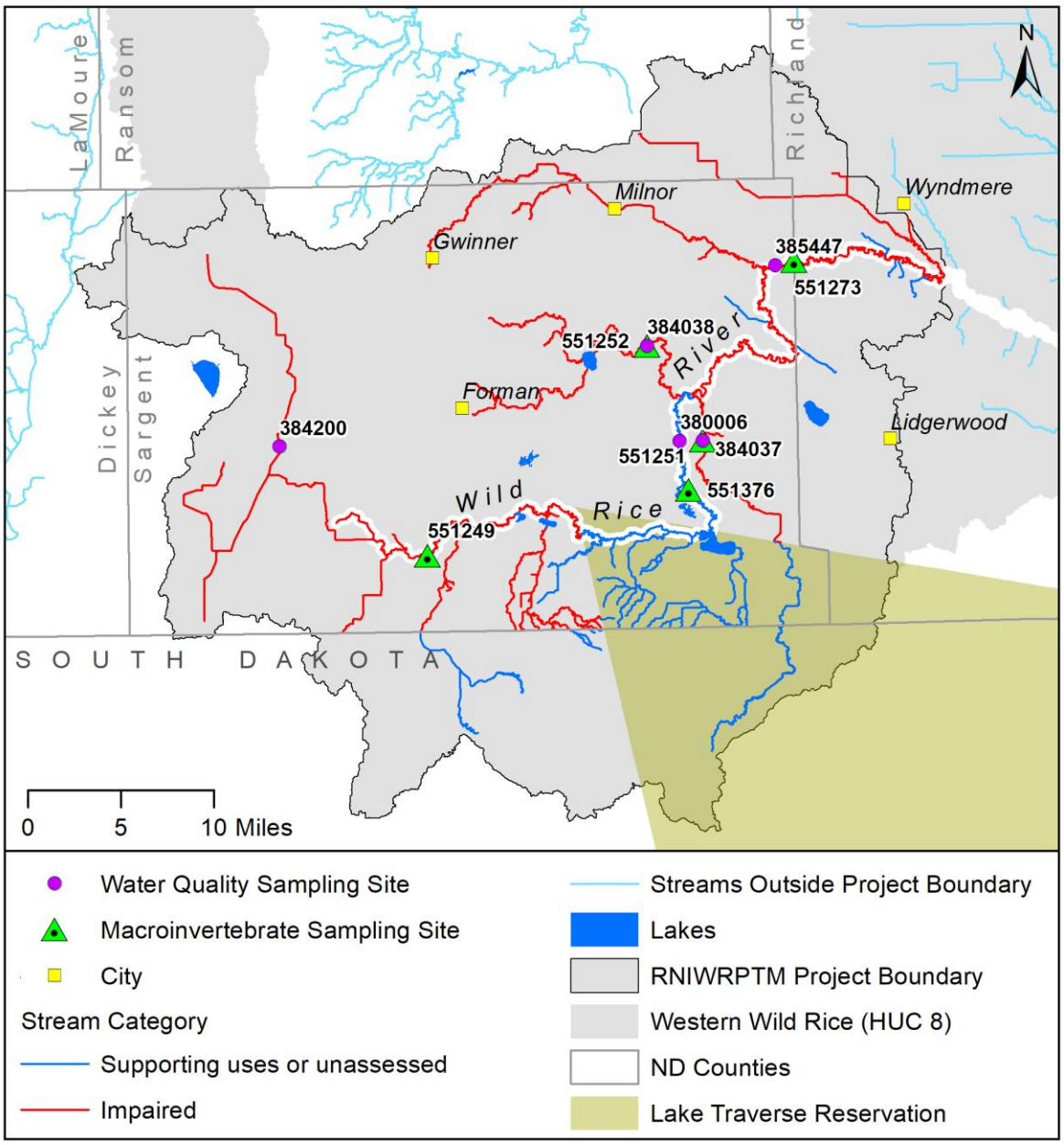


Figure E1. A map of the portion of the Wild Rice River Watershed and project sampling locations within Sargent County. The Wild Rice River is highlighted in white.

Table E1. The pollutants and their standard or benchmark values used to assess the conditions of streams in the project area.

Pollutant	Standard or Benchmark
E. coli	Monthly geometric mean ≤ 126 CFU/100mL (CFU = colony forming units) AND ≤ 10% monthly samples exceed 409 CFU/100mL
Total Suspended Solids	North Dakota does not currently have numeric water quality standards for TSS. At the time of project development, NDDEQ staff used a guideline target of ≤ 35 mg/L.
Total Nitrogen	North Dakota does not currently have numeric water quality standards for TN. At the time of project development NDDEQ staff used an ecoregion target of ≤ 1.047 mg/L.
Total Phosphorous	North Dakota does not currently have numeric water quality standards for TP. At the time of project development NDDEQ staff used an ecoregion target of ≤ 0.215 mg/L.
Index of Biological Integrity	A macroinvertebrate IBI score < 59 for streams in this ecoregion is considered "Most Disturbed" (target of ≥ 59).

Table E2. Project sampling sites and pre-project water body conditions based on data collected from 2008-2018.

Site IDs	Water Body	Assessment Unit ID	Pre-Project Status*
384200 551249	Legal drain to Wild Rice & Wild Rice River	ND-09020105-019-S_00	Recreation: Impaired due to high levels of *E. coli* Aquatic Life: Insufficient data
380006 551376	Wild Rice River	ND-09020105-015-S_00	Recreation: Supporting Aquatic Life: Supporting
384038 551252	Crooked Creek	ND-09020105-017-S_00	Recreation: Impaired due to high levels of *E. coli* Aquatic Life: Insufficient data
384037 551251	Shortfoot Creek	ND-09020105-016-S_00	Recreation: Impaired due to high levels of *E. coli* Aquatic Life: Insufficient data
385447 /385234** 551273	Wild Rice River	ND-09020105-012-S_00	Recreation: Impaired due to high levels of *E. coli* Aquatic Life: Impaired due to sedimentation and habitat alteration

***E.coli Bacteria*:**

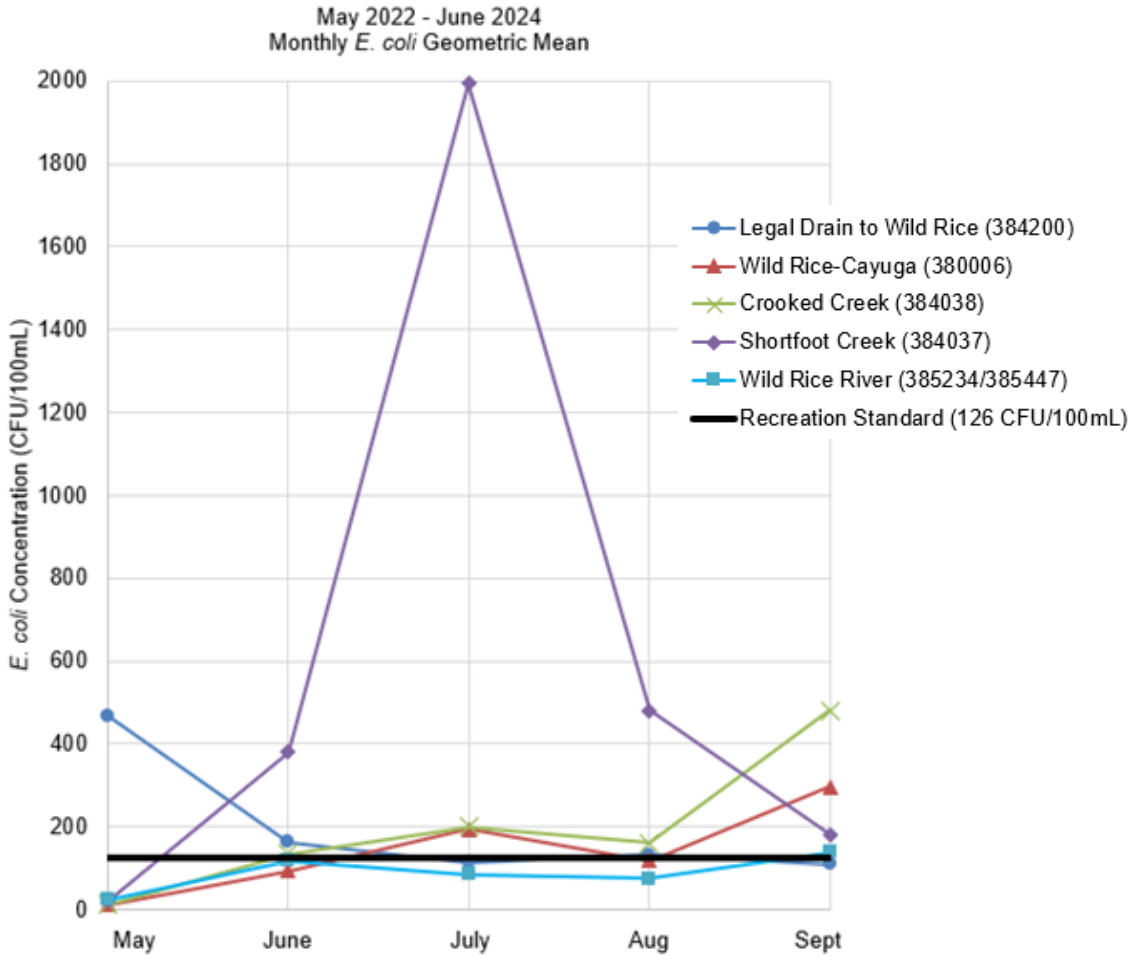


Figure E2. *E. coli* bacteria monthly geometric means at sampling locations.

Table E3. *E.coli* summary statistics for samples collected May 2022 – June 2024.

Site ID	Water Body	Number of Samples	Concentration (CFU/100mL†)			
			Minimum	Maximum	Average	Median
384200	Legal drain to Wild Rice	46	< 10*	1,000	237	155
380006	Wild Rice River	51	< 10*	8,200	337	98
384038	Crooked Creek	49	< 10*	3,100	262	130
384037	Shortfoot Creek	48	< 10*	> 24,000**	1,988	190
385447 385234	Wild Rice River	56	< 10*	1,200	167	63

†CFU = colony forming units *result lower than detection limit **result higher than detection limit

Table E4. Overall change in *E. coli* concentration during sample period (May 2022 – June 2024).

Site ID	Water Body	Overall Change
384200	Legal drain to Wild Rice	Increase
380006	Wild Rice River	Decrease
384038	Crooked Creek	Increase
384037	Shortfoot Creek	Decrease
385447 & 385234	Wild Rice River	Decrease

Total Suspended Solids (TSS):

Table E5. Total suspended solids summary statistics for samples collected May 2022 – June 2024.

Site ID	Water Body	Number of Samples	Concentration (mg/L)			
			Minimum	Maximum	Average	Median
384200	Legal drain to Wild Rice	61	< 5*	75	16	9
380006	Wild Rice River - Cayuga	62	7	183	37	33
384038	Crooked Creek	58	< 5*	19	4	< 5*
384037	Shortfoot Creek	60	< 5*	130	14	< 5*
385447 385234	Wild Rice River	67	7	228	59	48

Table E6. Overall change in annual average TSS concentration during sample period (May 2022 – June 2024).

Site ID	Water Body	Overall Change
384200	Legal drain to Wild Rice	Decrease
380006	Wild Rice River – Cayuga	Decrease
384038	Crooked Creek	Increase
384037	Shortfoot Creek	Decrease
385447 & 385234	Wild Rice River	Increase

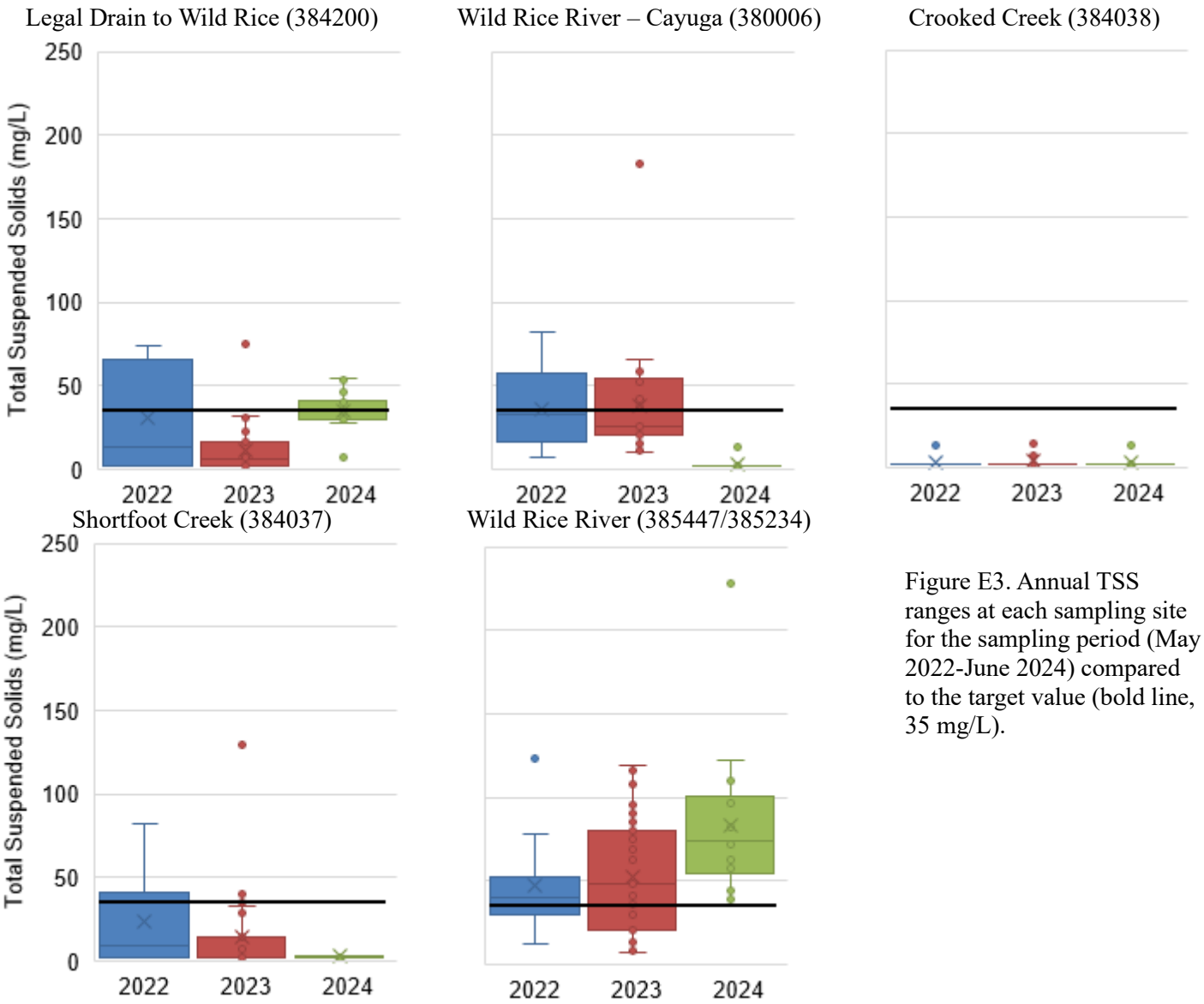


Figure E3. Annual TSS ranges at each sampling site for the sampling period (May 2022-June 2024) compared to the target value (bold line, 35 mg/L).

Total Nitrogen (TN):

Table E7. Total Nitrogen summary statistics for samples collected May 2022 – June 2024.

Site ID	Water Body	Number of Samples	Concentration (mg/L)			
			Minimum	Maximum	Average	Median
384200	Legal drain to Wild Rice	61	1.11	4.04	1.76	1.68
380006	Wild Rice River - Cayuga	62	0.83	2.74	1.41	1.38
384038	Crooked Creek	58	0.94	2.6	1.34	1.3
384037	Shortfoot Creek	60	0.52	5.2	1.31	1.21
385447 385234	Wild Rice River	65	0.71	3.67	1.33	1.23

Table E8. Overall change in annual average TN concentration during sample period (May 2022 – June 2024).

Site ID	Water Body	Overall Change
384200	Legal drain to Wild Rice	Decrease
380006	Wild Rice River – Cayuga	Increase
384038	Crooked Creek	Increase
384037	Shortfoot Creek	Increase
385447 & 385234	Wild Rice River	Increase

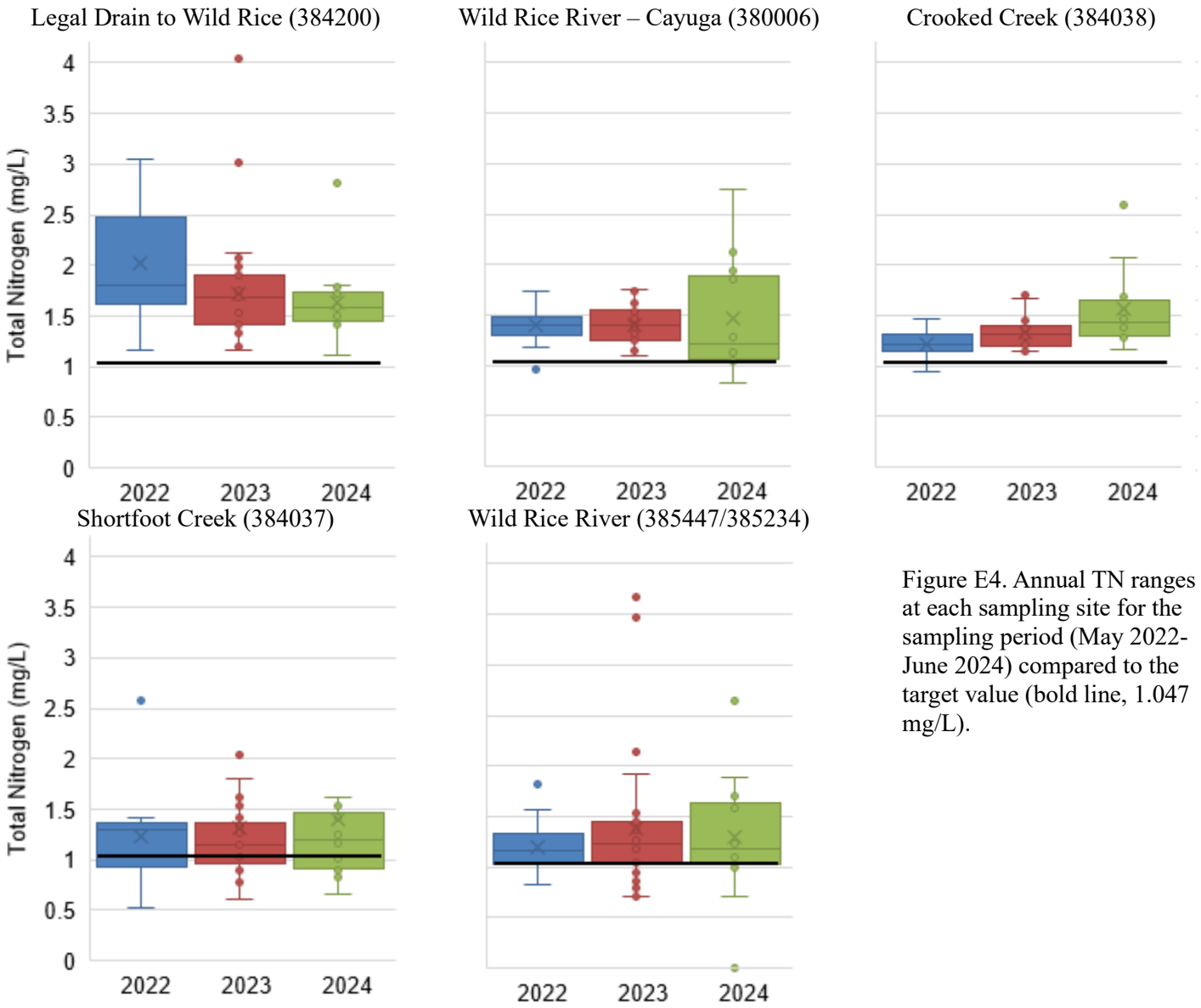


Figure E4. Annual TN ranges at each sampling site for the sampling period (May 2022-June 2024) compared to the target value (bold line, 1.047 mg/L).

Total Phosphorous (TP):

Table E9. Total phosphorous summary statistics for samples collect May 2022 – June 2024.

Site ID	Water Body	Number of Samples	Concentration (mg/L)			
			Minimum	Maximum	Average	Median
384200	Legal drain to Wild Rice	61	< 0.02*	0.257	0.121	0.111
380006	Wild Rice River - Cayuga	62	0.056	0.460	0.232	0.230
384038	Crooked Creek	58	0.265	1.28	0.765	0.773
384037	Shortfoot Creek	60	0.024	0.880	0.306	0.294
385447 385234	Wild Rice River	67	0.076	0.851	0.289	0.264

Table E10. Overall change in annual average TP concentration during sample period (May 2022 – June 2024).

Site ID	Water Body	Overall Change
384200	Legal drain to Wild Rice	Decrease
380006	Wild Rice River – Cayuga	Decrease
384038	Crooked Creek	Decrease
384037	Shortfoot Creek	Decrease
385447 & 385234	Wild Rice River	Decrease

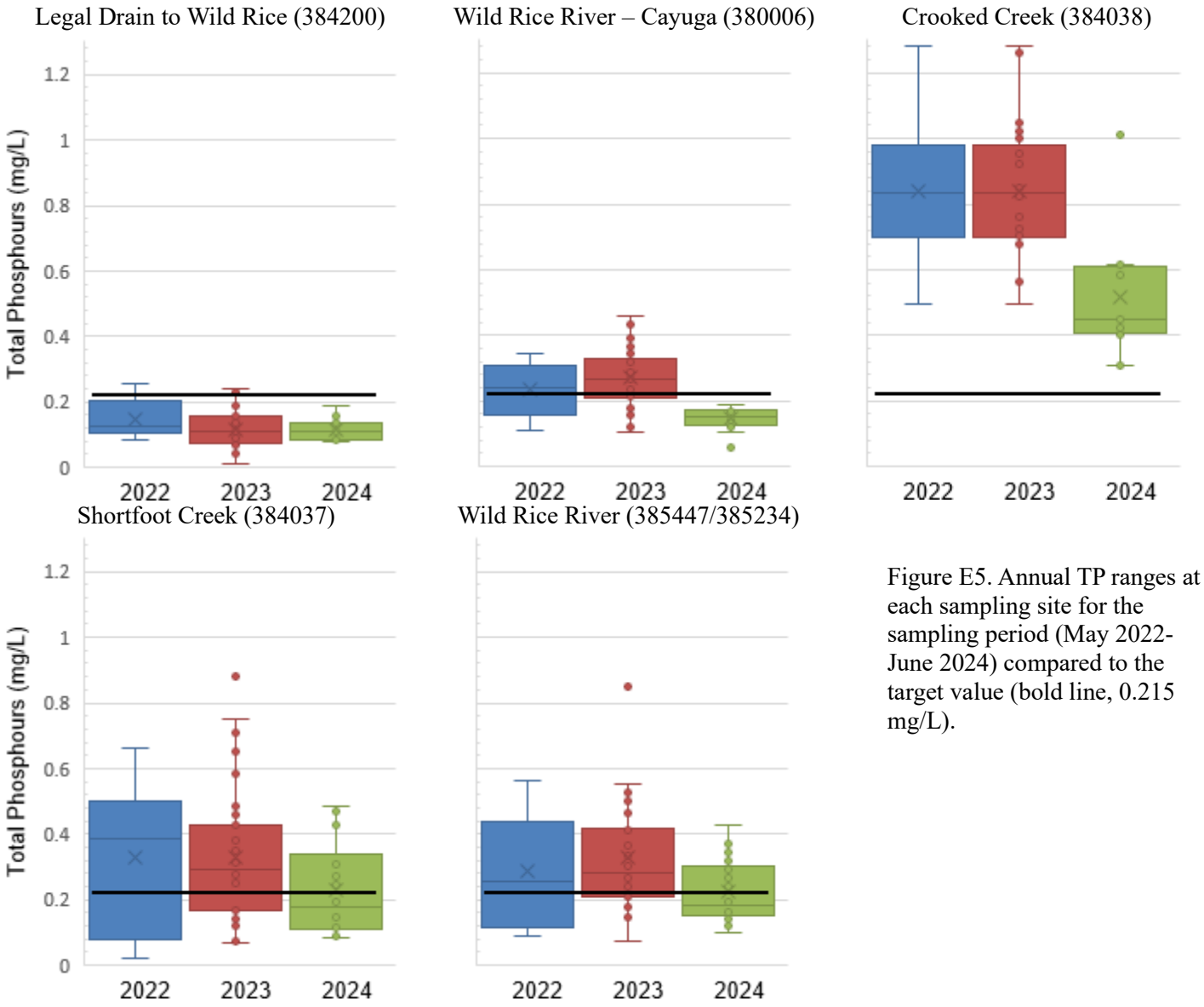


Figure E5. Annual TP ranges at each sampling site for the sampling period (May 2022-June 2024) compared to the target value (bold line, 0.215 mg/L).

APPENDIX F. MILESTONE TABLE

Table F1. Milestone table for the Wild Rice River PTMApp Prioritization & Implementation Project Phase II.

Task/Responsible Organization	Output	Quantity	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1: Staff/PTMApp							
Task 1.1: 319 & Office Coordinator *Group 3*	1.1 FT Employee	1.1	1.1	1.1	1.1	1.1	1.1
Task 1.2: PTMApp Support *Group 3, 4, & 5*	Priority catchment	50	10	10	10	10	10
Task 1.3: PTMApp Scenario Builder *Group 3, 4, & 5*	BMP Prioritization Maps	5	-	-	X	-	-
Task 1.4: Program Funding *Group 3 & 4*	BMP Funding	-	-	-	X	-	X
Objective 2: BMPs							
Task 2.1: Riparian *Group 1, 2, 3, & 4*	Acres	250	50	50	50	50	50
Task 2.2: Cropland *Group 1, 2, 3, & 4*	Acres	1,000	200	200	200	200	200
Task 2.3: Grazing Mgmt *Group 1, 2, 3, & 4*	Systems	5	1	1	1	1	1
Objective 3: Water Quality							
Task 3.1: Sampling & Data Comp. *Group 3 & 4*	Samples & Data	-	X	X	X	X	X
Objective 4: Outreach							
Task 4.1: Events & Education *Group 1 & 3*	Outreach Events	15	3	3	3	3	3
Task 4.2: High Tunnel *Group 3*	Outreach Events	5	1	1	1	1	1

Table F2. Key for the groups numbers and organizations listed in Table E1.

Group Number	Organization and Tasks
Group 1	NRCS - Provide technical assistance to plan, design and implement BMPs Also provide financial assistance to CCSP Farm through Contribution Agreement
Group 2	Private landowners - Make land management decisions to implement BMP's Provide cash / In-Kind match for Best Management Practices
Group 3	Wild Rice SCD - Local project manager and sponsor; including responsibilities for project Coordination, payments, match tracking, and progress reports to NDDEQ
Group 4	North Dakota Department of Environmental Quality - Section 319 program Management including oversight of planning/expenditures
Group 5	International Water Institute - Provide training and assistance on PTM App Help with Scenario Builder and GIS Work in PTMApp

APPENDIX G. STANDARD OPERATING PROCEDURES FOR THE COLLECTION AND PRESERVATION OF STREAM AND RIVER GRAB SAMPLES FOR CHEMICAL AND BIOLOGICAL ANALYSIS

Summary

Grab samples collected for chemical analysis should be representative of the entire stream or river. To be representative, samples must be carefully collected, properly preserved, and appropriately analyzed. In general, samples should be collected from the main current of the stream or river at 60% of the total stream depth.

In ideal conditions grab samples are only collected on low gradient and slow-moving streams. The grab sample can be collected either by wading or by lowering a sampling device such as a Kemmerer sampler, Van Dorn sampler or weighted open bucket from a bridge crossing.

When collecting the sample by wading, enter the stream slightly down current from the appropriate sampling site, then wade to the area with the greatest current. Rinse each sample bottle and lid 3 times with stream water prior to collecting the sample. Place lid on sample bottle then submerge to approximately 60 percent of the stream depth, remove the lid and allow the bottle to fill facing towards the current. Replace the lid prior to removing bottle from stream. A small portion of the sample will need to be decanted off prior to preserving and/or placing in cooler. Note: In very shallow streams care must be taken not to contaminate the sample with bottom sediments.

When collecting from a bridge using a Kemmerer or Van Dorn sampler, lower the device into the stream and trip the sampler at 60 percent of the total stream depth. If using a weighted open-mouthed bucket, allow the bucket to descend nearly the entire stream depth and then rapidly retrieve.

Equipment and Supplies

- 2.2. or 3.2-liter non-metallic sampler (e.g., Kemmerer or Van Dorn sampler), with rope marked at 0.5-meter depth intervals and a messenger.
- Sample containers (see Table 3.1, Standard Operation for Field Procedures)
- Acid for sample preservation (see Table 3.1, Standard Operation for Field Procedures)
- Sample labels.
- Clear Tape for sample containers
- Coolers with ice and/or frozen gel pack(s).
- Deionized water for sample blanks and decontamination.
    - Filter apparatus.

- For vacuum method.
  - Vacuum filter holder.
  - Vacuum pump.
  - 0.45 µm membrane filters (Millipore HAWP 047 00 or equivalent).
  - Pre-filters (Millipore AP40 0047 05 or equivalent).
  - Stainless steel forceps.
- For peristaltic method.
  - Power Drive (Compact Cat No. P-07533-50 or equivalent)
  - Peristaltic head (Easy Load II Cat No. P-77200-62 or equivalent).
  - In-line 0.45 µm cartridge filters (Geotech dispos-a-filter or equivalent).
  - In-line 0.50 µm cartridge pre-filters (Geotech dispos-a-filter or equivalent).
  - Tubing (Masterflex silicone Cat No. P-96400-24 or equivalent).
  - Churn Splitter.
- Field report form.
- Sample ID/Custody Record.
- Black ballpoint pen or mechanical pencil.
- Sample and blank log forms.
- Power ice auger (winter sampling).
- Ice skimmer (winter sampling).
- Sled (winter sampling).
- Stainless steel forceps.

Procedure

Stream Sample Collection

1. Place a label on each sample container and use clear tape to secure the label to the container (Figure 7.08.2).

2. Triple rinse each sample bottle using stream water. Note: Do not rinse the fecal coliform bacteria or the pesticide sample bottles.

3. Fill the sample bottle: Samples should be collected in the main current at that depth which is approximately 60 percent of the total water depth below the surface. When stream depth permits, a sample may be collected by wading the stream and inserting sample container facing against the current, allowing it to fill naturally at the appropriate depth. At greater water depths, an appropriate sampling device should be used. Note: Care should be taken so that the sample is not contaminated by disturbing the stream bed upstream from the collection point.

4. Preserve the sample containers appropriately and place all samples in a cooler on ice.

5. Fill out the Sample ID/Custody Report (Figure 7.08.3) and the water chemistry sample log (Figure 7.08.1).

Stream Blank Sample Collection

1. Field blank samples are collected with first and every tenth stream sample collected (i.e., 1, 10, 20). If the sample log indicates a blank sample should be collected, follow the steps below.
2. Place a label on each sample container (Figure 7.08.2) and fill out the sample information log form (Figure 7.08.1). Note: Field sample blanks should be identified with STORET number 389990.
3. Using deionized water, triple rinse each sample bottle.
4. Fill each bottle with deionized water.
5. Preserve each sample appropriately. Note: Do not preserve the total dissolved phosphorus sample.
6. Place the sample in a cooler on ice.

Stream Duplicate Sample Collection

1. Duplicate samples are collected with the first and every following tenth stream sample collected (i.e., 1st, 10th, 20th). If the sample log indicates a duplicate sample should be collected, follow the steps below.
2. Place a label on each sample container (Figure 7.08.2) and fill out the Sample ID/Custody Report (Figure 7.08.3). Note: Duplicate samples should be identified with STORET number 389999. Be sure to indicate on the label the project name and type of sample being duplicated.
3. Collect the sample following steps (a) - (c) in the procedure for Stream Sample Collection.
4. Place the samples in a cooler on ice.

APPENDIX H. BUDGET TABLE

Table H1. The proposed budget table for the WRRPPIP Phase II.

Sect 319/non-Fed	**Y1:** 2025	**Y2:** 2026	**Y3:** 2027	**Y4:** 2028	**Y5:** 2029	**Total Cost**	**In-Kind/Match**	**319 Funds**
Personnel/Support - Tasks 1.1-1.4, 3.1								
A. Personnel - 1 FTE	$23,400.00	$46,800.00	$46,800.00	$46,800.00	$46,800.00	$210,600.00	$84,240.00	$126,360.00
B. Fringe Benefits	$2,500.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$22,500.00	$9,000.00	$13,500.00
C. Travel, Food, Lodging	$250.00	$500.00	$500.00	$500.00	$500.00	$2,250.00	$900.00	$1,350.00
D. Supplies	$250.00	$500.00	$500.00	$500.00	$500.00	$2,250.00	$900.00	$1,350.00
E. Rent/Utilities	$600.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$5,400.00	$2,160.00	$3,240.00
F. Communications	$600.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$5,400.00	$2,160.00	$3,240.00
G. Equipment	$250.00	$500.00	$500.00	$500.00	$500.00	$2,250.00	$900.00	$1,350.00
H. Consultant/Contractual	$750.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$6,750.00	$2,700.00	$4,050.00
I. Training	$250.00	$500.00	$500.00	$500.00	$500.00	$2,250.00	$900.00	$1,350.00
J. Administration Asst. - .1 FTE	$2,500.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$22,500.00	$9,000.00	$13,500.00
Subtotal	$31,350.00	$62,700.00	$62,700.00	$62,700.00	$62,700.00	$282,150.00	$112,860.00	$169,290.00
BMPs: See Appendix # for Examples of BMPs								
Task 2.1 Riparian	$5,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$45,000.00	$18,000.00	$27,000.00
Task 2.2 Cropland	$3,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$27,000.00	$10,800.00	$16,200.00
Task 2.3 Grazing/Manure Mgmt	$2,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$18,000.00	$7,200.00	$10,800.00
Subtotal	$10,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$90,000.00	$36,000.00	$54,000.00
**Additional BMPs Dollars may be provided through partners (NDGF, Pheasants Forever, Ducks Unlimited, etc.) or requested from NDDEQ as needed.*								
Outreach								
Task 4.1 Meetings/Outreach Events	$250.00	$500.00	$500.00	$500.00	$500.00	$2,250.00	$900.00	$1,350.00
Task 4.2 High Tunnel	$2,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$18,000.00	$7,200.00	$10,800.00
Subtotal	$2,250.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$20,250.00	$8,100.00	$12,150.00
Total 319/non-Federal Budget	**$43,600.00**	**$87,200.00**	**$87,200.00**	**$87,200.00**	**$87,200.00**	**$392,400.00**	**$156,960.00**	**$235,440.00**
Section 319 Funds per Year	$26,160.00	$52,320.00	$52,320.00	$52,320.00	$52,320.00			
Total Local Match per Year	$17,440.00	$34,880.00	$34,880.00	$34,880.00	$34,880.00			