PROJECT SUMMARY SHEET

1.0 Project Title: Wild Rice River Restoration and Riparian Project Phase III

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	Agriculture wetlands

Project Location: The project area lies within the Western Wild Rice Hydrologic Unit, 09020105, located in Southeastern North Dakota. The specific focus of this phase of the project will be on the ½ mile corridor along the Wild Rice River in Sargent County and the subwatersheds for the tributaries named Shortfoot and Crooked Creek.

Summarization of Major Goals: The Wild Rice Soil Conservation District, primary goal, through the course of the project is to promote and implement agricultural Best Management Practices (BMP) to restore and maintain the recreational and aquatic life uses of the targeted areas along the Wild Rice River and within the Shortfoot and Crooked Creek subwatersheds. Reduction of nutrients; (phosphorus & nitrogen) E. coli bacteria and sediment will be accomplished through; implementing nutrient management plans, reducing erosion and runoff from cropland, establishing vegetative buffers, and addressing degraded riparian areas.

Project Description: This watershed project will implement comprehensive conservation planning, BMP implementation, monitoring/assessment, and information/demonstration project in the watersheds for the Wild Rice River as well as Crooked and Shortfoot Creeks to reduce NPS pollution impacts to aquatic life and recreational uses. Emphasis will be placed on improving vegetative conditions and management within the riparian corridor and on lands immediately adjacent to the river or creeks.

FY18- 319 funds requested - $210,000 Match $140,000
Other Federal Funds - $113,936 Total project cost $462,679.50
§319 Funded Full Time Personnel – 1.1

The main objectives are:

1. Target priority areas in the watershed for the implementation of BMP's that will reduce E. coli bacteria and sediment delivery to the river and creeks. We can achieve this with BMPs, cost share assistance, and technical assistance for long term planning. The flat stream channels allow tillage right to the waters' edge, so the installation of long term riparian and grass buffers will benefit sediment reduction.

2. Increase the IBI score for the specific reaches being addressed by the project to achieve a fair to good ranking (>70 for good and 59-70 for fair).

3. Document trends in water quality and beneficial use conditions (i.e. nutrient/sediment and E. coli bacteria concentrations, riparian conditions, fish and macro invertebrate diversity, etc.) as BMPs are applied to evaluate progress toward established goals.

4. Provide opportunities for producers and the general public to increase their understanding of NPS pollution related to agricultural production, potential cropping options, and understanding the importance of slowing water runoff, and enhance infiltration using management systems that can reduce the delivery of sediments and nutrients to rivers, lakes, and streams in Southeastern ND.

2.0 STATEMENT OF NEED:

2.1 Project Reference: The Wild Rice Soil Conservation District (SCD) has worked to protect the natural, economic, and recreational value of the Wild Rice River since watershed planning began in 1999 through the Wild Rice Watershed Restoration Action Strategy (WRAS) by providing financial and technical assistance to reduce the effects of non-point source pollution. The SCD has received Section 319 funding for the previous NPS pollution management efforts in the Wild Rice River watershed. It is important to know that in the September 2017 North Dakota Department of Health newsletter, the Wild Rice River Restoration and Riparian Project was highlighted for providing improved water quality in the Shortfoot Creek sub-watershed has improved (Appendix H). The current grant has already delivered planted; 769.2 acres of cover crops, 5 acres of critical plantings, 53.4 acres of riparian herbaceous cover and planted 4042 ln ft. of trees, in addition to preserving 19.5 acres through our riparian easement program, putting up 12,497.8 ft. of fence to increase a producer's rotational grazing, and renovated 1 residential septic system that was discharging in to the Wild Rice River. For more information on past activities please see our final report that will be coming out this fall. Specific practices applied through these previous projects are provided in Appendix A. During Phase III, Section 319 funding for the Wild Rice River (Sargent County) Watershed and Riparian Restoration Project will be targeted toward practices that improve the management and vegetative conditions in the riparian corridor and lands immediately adjacent to the river and its tributaries. In many areas of the watersheds, excessive soil erosion is associated with intensive agricultural activity and/or frequent over land flooding due to heavy rains and abundant snowfall. These conditions are causing failing streambanks, scalloping, and fluvial erosion. In addition to erosion; E. coli levels are a concern throughout many of the watersheds in Sargent County causing them to be listed as impaired. Poor nutrient management agricultural practices, outdated residential septic systems, and overloaded urban storm sewers all contribute towards elevated E. coli levels.

The Wild Rice Soil Conservation District will use funding through Phase III to support the development and implementation of comprehensive conservation plans. These plans will address these erosion issues and restore and protect beneficial uses being impaired on the Wild Rice River as well as Shortfoot and Crooked Creeks including; but not limited to aquatic life, recreation, drinking water, fish consumption, and agriculture/industrial use. Subsection 2.5 summarizes the current water quality and beneficial use conditions of the Wild Rice River and Shortfoot and Crooked Creeks.

The Conservation Cropping Systems Project (CCSP) farm will demonstrate and research advances in emerging technology for in crop establishment of cover crops, and promote soil conservation practices. Through outreach and education at the CCSP Farm we can convince area producers that water quality can be improved in our local area by keeping more residue on the soil surface, wider adoption of cover crops, and the improvement of water infiltration into the soil. All of these items are consistent with "soil health". Currently increased tillage has been used to dry soil out during wet periods. If cover crops could be used instead, it would substantially change the need for tillage. These technologies need to be further tested to establish credibility with local farmers before widespread adoption can happen.

2.2Watershed Description: The Wild Rice River watershed is located in Cass, Dickey, Ransom, Richland and Sargent Counties in Southeastern North Dakota and Marshall and Roberts Counties 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. 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.

Phase III of the project will not address the entire Wild Rice Watershed in Sargent County. Phase III will focus on the ½ mile corridor along the river as well as the subwatersheds for Shortfoot Creek and Crooked Creek. Maps of the Phase III project area are provided in Figure 2 on page 5.

2.3 Maps: An Annualized Agricultural NonPoint Source Pollution (AnnAGNPS) model was developed for the Shortfoot and Crooked Creek subwatersheds. The AnnAGNPS model uses soils, fertilization rates, cropping systems, elevation, land-use, precipitation data, etc. to 1) characterize the size and shape of the watershed and 2) identify "high priority areas" that are potentially the most significant sources of nutrients (N & P) and sediment in the Wild Rice River watershed. The results of the AnnAGNPS model will be used to target technical and financial assistance for the implementation of BMPs within the watershed.

2.4 General Watershed Information The western Wild Rice River watershed is 580,914 acres in size and it originates in Sargent County and encompasses a majority of the county. The climate is sub-humid characterized by warm summers with frequent hot days and occasional cool days. Average temperatures range is from 12º F in winter to 60º F in summer. Precipitation occurs primarily during the warm period and is normally heavy in later spring and early summer. Total annual precipitation is about 24 inches.

The western Wild Rice River is characterized by highly fertile upland, 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 river and its tributaries as well as the lakes connected to the river are classified as a warm water fishery, "waters capable of supporting growth and propagation of non-salmonid fishes and associated aquatic biota (NDDH). Approximately 24 fish species are found in the Wild Rice River Watershed, offering a fishery for local fisherman, particularly in the lower reaches of the river. Documented species include; Northern Pike, Walleye, White Sucker, Shorthead, Redhorse, Quillback, Black Bullhead, Tadpole Madtom, Carp, Fathead Minnow, Spotfin Shiner, Common Shiner, and Iowa Darter (NDDH 1994-1995 test netting).

The dominant land use in the western Wild Rice River watershed is row crop agriculture with 59 percent of the land in cropland, 16 percent in grassland, and 11 percent in wetlands, the remaining 14 percent is in other land uses. The majority of the crops grown are corn, soybeans, spring wheat, alfalfa, winter wheat, sunflowers, and dry beans.

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 located in Cass, Dickey, Ransom, Richland and Sargent Counties in southeastern North Dakota and Marshall and Roberts Counties in northeastern South Dakota (Figure 1). The Wild Rice River sub-basin (hydrologic unit 09020105) has an aerial extent of approximately 1.4 million acres. The target watersheds (Shortfoot and Crooked Creek) for the WRRRR PIP have a total combined area of 156,347 acres (Figure 2).

The Wild Rice River Restoration and Riparian Project Phase II will implement a comprehensive conservation planning, BMP implementation, monitoring/assessment, and information/demonstration project in the watersheds for the Wild Rice River as well as Crooked and Shortfoot Creeks to reduce NPS pollution impacts to aquatic life and recreational uses. Emphasis will be placed on improving vegetative conditions and management within the riparian corridor and on lands immediately adjacent to the river or creeks (Figure 2).

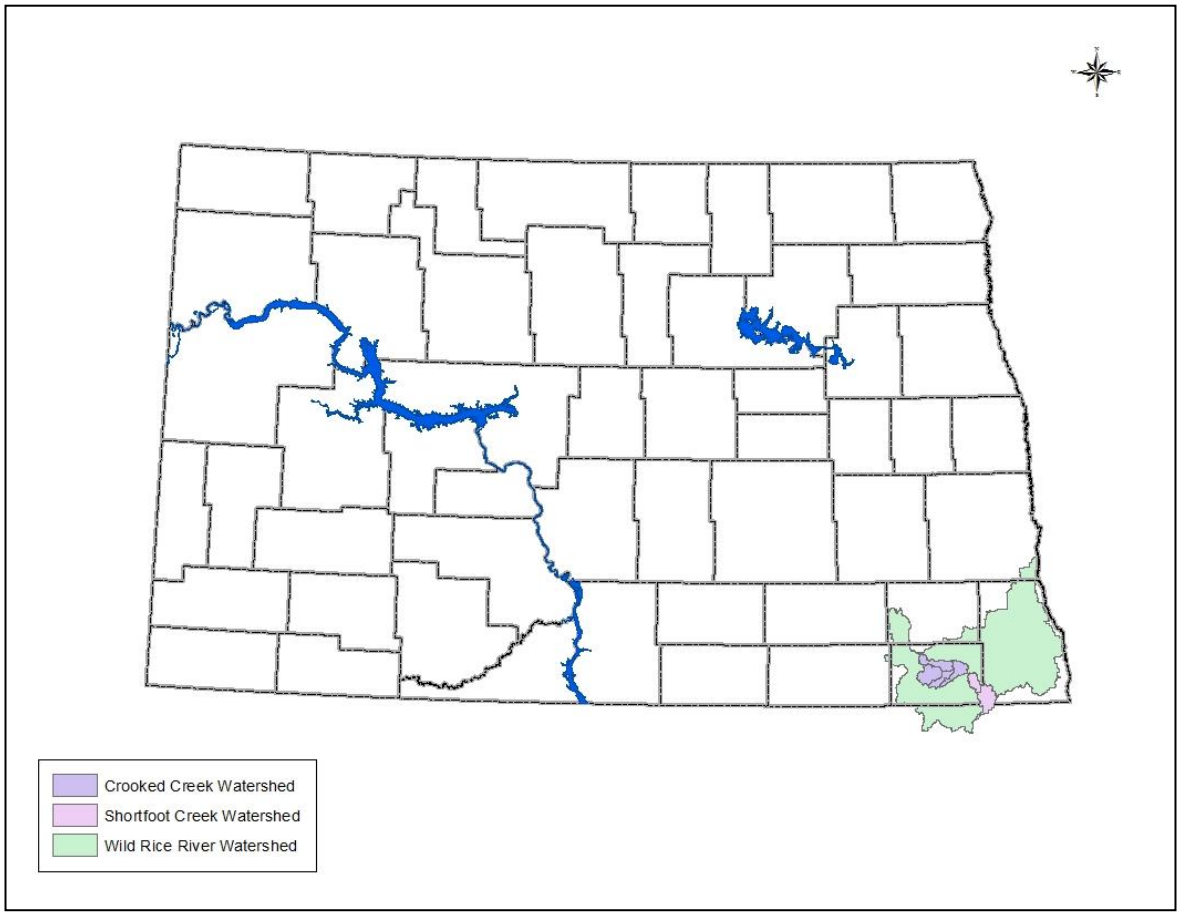


Figure 1. Location of the Wild Rice River, Crooked Creek and Shortfoot Creek Watersheds.

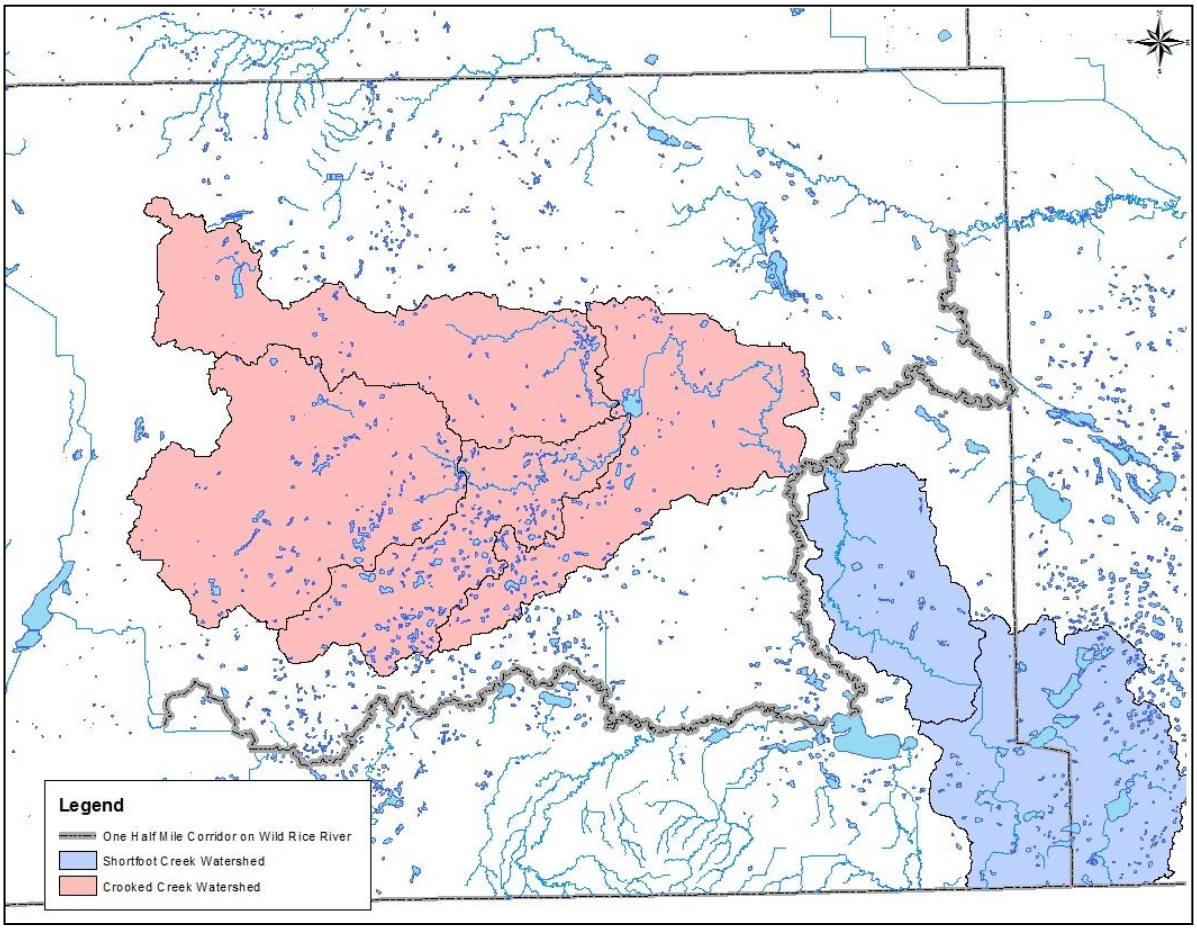


Figure 2. Location of the Implementation Focus Areas for Crooked and Shortfoot Creek Watershed.

According to the North Dakota 2016 Integrated Section 303(d) List of Waters Needing Total Maximum Daily Loads, the North Dakota Department of Health has identified 43.5 miles of Crooked Creek (ND-09020105-017-S_00) as fully supporting but threatened and 24.78 miles of Shortfoot Creek (ND-09020105-016-S_00) as not supporting recreational beneficial uses due to Escherichia Coli (*E. coli*) bacteria (Figure 3).

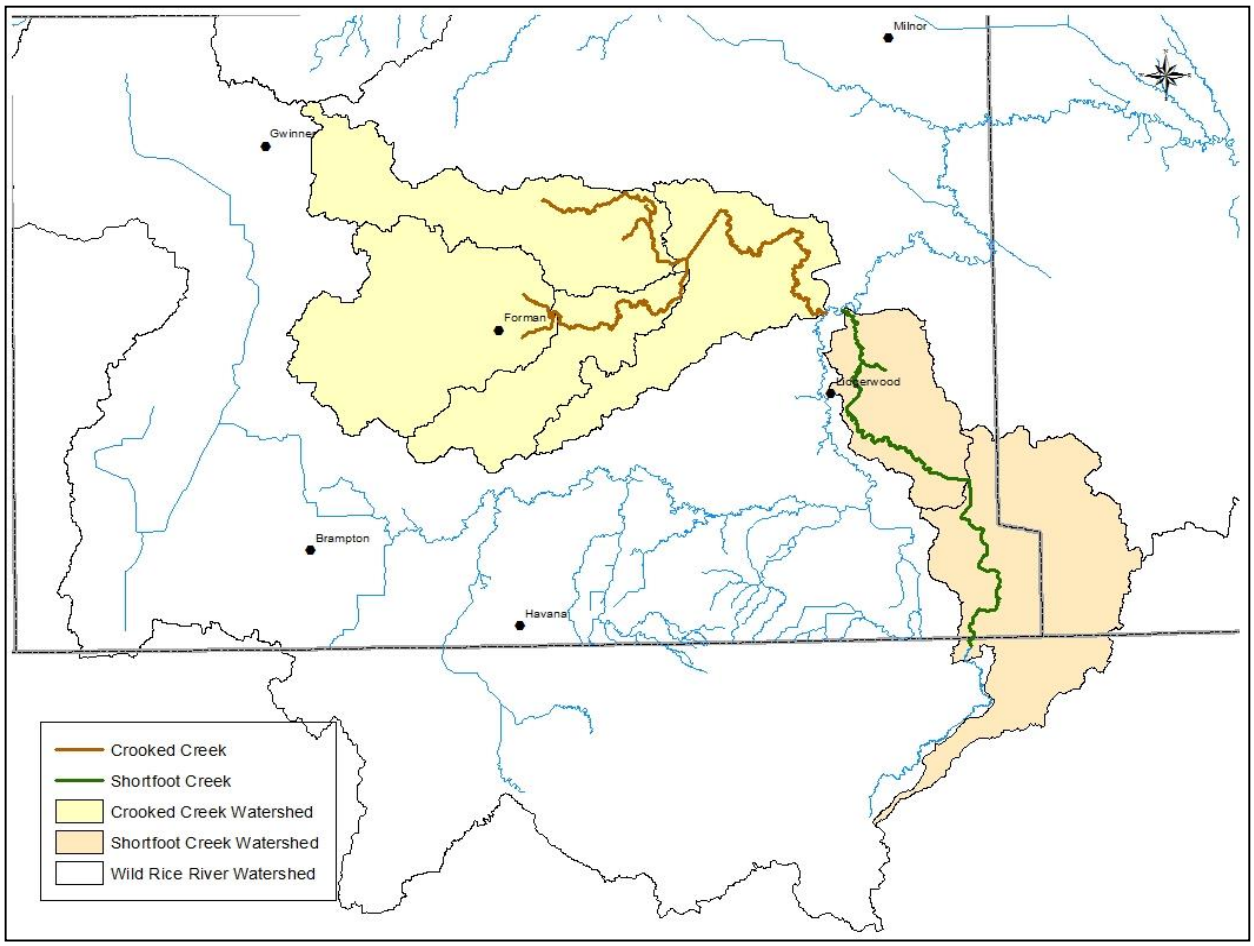


Figure 3. Location of 303(d) Listed Impaired Segments in the Crooked Creek and Shortfoot Creek Watershed.

2.5.2 Weather Data

Precipitation data for Crooked Creek and Shortfoot Creek Watersheds was obtained from the North Dakota Agricultural Weather Network (NDAWN) station located near Brampton, ND southwest of the watershed. Since the Brampton station was established in 2014, monthly precipitation data was only analyzed for 2015-2017 (Figure 4). The total annual rainfall for the Brampton station for the years of 2015 to 2017 was 13.08, 19.56 and 17.88, respectively. Rainfall varied in amount and distribution throughout the three year period.

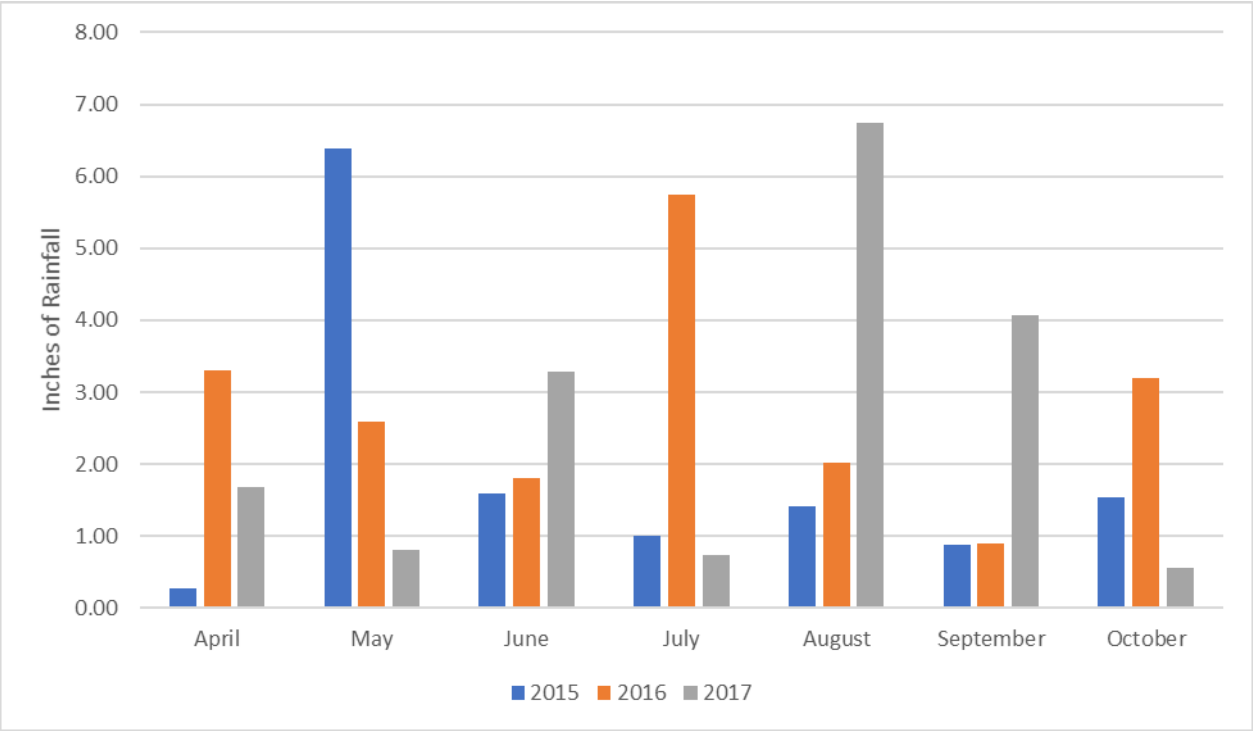


Figure 4. Monthly Precipitation for NDAWN Weather Station Located Near Brampton, ND.

2.5.3 Hydrology

Crooked Creek and Shortfoot Creek have the characteristics and hydrological function of an intermittent stream. An intermittent stream is defined as a stream with a well-defined channel that contains water for only part of the year, typically during spring and early summer. Intermittent streams are normally dry during hot summer months and most of the flow occurring during this time period is caused by runoff from heavy precipitation.

2.5.4 Monitoring Goals

The primary goal of the monitoring component is to determine the effectiveness of technical assistance and installed BMPs provided through the Section 319 NPS Pollution Project Implementation Plan, in improving water quality and restoring recreational and aquatic life beneficial uses within the Crooked Creek and Shortfoot Creek in Sargent County. The monitoring methodology can be found in the *Wild Rice River Restoration and Riparian Project Phase II QAPP*.

2.5.5 Project Goals

The goal of the project is to restore riparian habitat and buffering capabilities in Crooked and Shortfoot Creek watersheds as well as along the mainstem of the Wild Rice River in Sargent County to improve aquatic life uses in the creeks and river. As a secondary goal, livestock and cropland management immediately adjacent to the creeks and river will also be addressed to enhance and protect the function of the riparian corridor. The projects objectives and tasks can be found in *Wild Rice River Restoration and Riparian Project Phase II*.

2.5.6 Water Quality Standards

Based on the *Standards of Water Quality for the State of North Dakota* (NDDoH, 2011), the Wild Rice River is classified as a Class II stream, while Shortfoot Creek and Crooked Creek are Class III streams.

Class II steams 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. 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, irrigation, bathing, or swimming.

Class III streams shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.

The State numeric standard for E. coli bacteria applies to all streams (Table 1). The E. coli bacteria standard applies only during the recreation season from May 1 to September 30.

Table 1. North Dakota Bacteria Water Quality Standards for Streams.

Parameter	Standard	
	Geometric Mean[1]	Maximum[2]
E. coli Bacteria	126 CFU/100 mL	409 CFU/100 mL

[1] Expressed as a geometric mean of representative samples collected during any consecutive 30-day period.
[2] No more than 10 percent of samples collected during any consecutive 30-day period shall individually exceed the standard.

2.5.7 Water Quality Monitoring Locations

Five stream sites were selected for data collection (Figure 5, Table 2). Water quality grab samples were collected for E. coli bacteria and nutrients. E. coli and nutrient sampling occurred during the recreational use season (May 1 through September 30).

Table 2. Water Quality Monitoring Stations of Shortfoot and Crooked Creek Watersheds.

Station	Location	Waterbody ID	Year	Parameters
384206	Shortfoot Creek	ND-09020105-016-S_00	2015-2017	*E. coli* and Nutrients
384037	Shortfoot Creek	ND-09020105-016-S_00	2015-2017	*E. coli* and Nutrients
384038	Crooked Creek	ND-09020105-017-S_00	2015-2017	*E. coli* and Nutrients
384203	Crooked Creek	ND-09020105-017-S_00	2015-2017	*E. coli* and Nutrients
384204	Crooked Creek	ND-09020105-017-S_00	2015-2017	*E. coli* and Nutrients

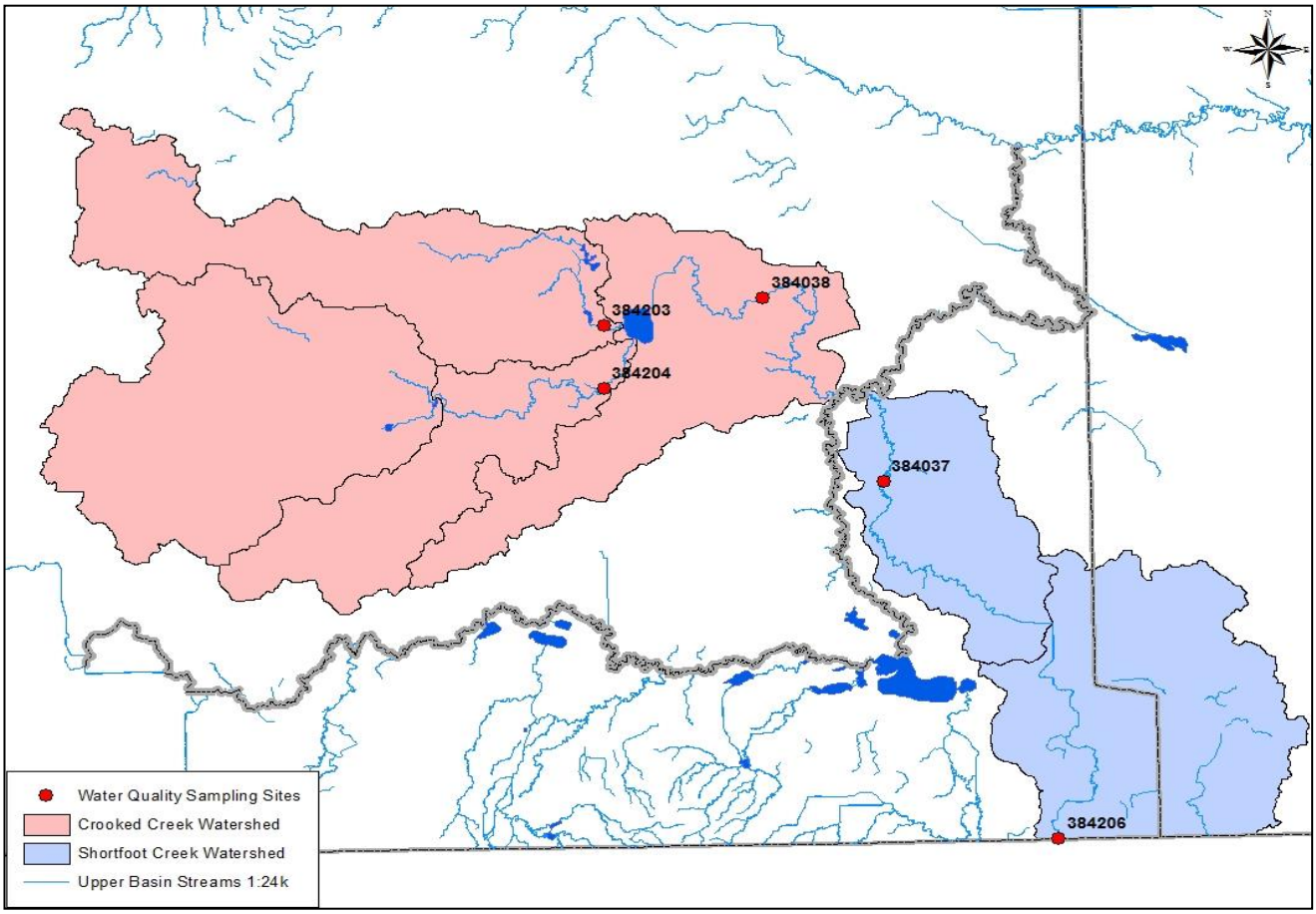


Figure 5. Water Quality Monitoring Locations in the Shortfoot and Crooked Creek Watersheds.

2.5.7.1 Pathogens

Recreation use includes primary contact activities such as swimming and wading and secondary contact activities such as boating, fishing, and wading. Recreation use in rivers and streams is considered fully supporting where there is little or no risk of illness through either primary or secondary contact with the water. The State's recreation use support assessment methodology for rivers and streams is based on the State's numeric water quality standards for E. coli bacteria (Section 1.1).

For each assessment based solely on E. coli data, the following criteria are used:

- Assessment Criteria 1: For each assessment unit, the geometric mean of samples collected during any month for May 1 through September 30 does not exceed a density of 126 CFUs/mL. A minimum of five monthly samples is required to compute the geometric mean. If necessary, samples may be pooled by month across years.

- Assessment Criteria 2: For each assessment unit, less than 10 percent of samples collected during any month from May 1 through September 30 may exceed a density of 409 CFUs per 100 mL. A minimum of five monthly samples is required to compute the percent of samples exceeding the criteria. If necessary, samples may be pooled by month across years.

The two criteria are then applied using the following use support decision criteria:

- Fully Supporting: Both criteria 1 and 2 are met.

- Fully Supporting but Threatened: Criterion 1 is met, but 2 is not.

- Not Supporting: Criterion 1 is not met. Criteria 2 may or may not be met.

The recreational use assessment methodology information provided above can be found in the *North Dakota 2016 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads*.

2.5.7.2 Total Nitrogen

Nitrogen is an essential nutrient for plants and animals. However, an excess amount of nitrogen in a waterway promotes the excessive growth of algae, when sufficient amounts of phosphorus are present. When the algae die and decompose, dissolved oxygen in the water, which is essential to the health of aquatic life, is consumed and can reach critically low levels resulting in mortality to fishes and other aquatic organisms. Increased levels of both nitrogen and phosphorus in the water can also lead to blue-green algae blooms which can be toxic to domestic animals, wildlife, and humans if ingested. The die-off of rooted vegetation due to lack of dissolved oxygen can lead to an increase in water temperature and to a decrease in suitable habitat for aquatic organisms. Both of these factors can lead to stress-caused mortality of aquatic life. In addition to the local effects on the river or stream itself, excessive transport of nutrients can cause eutrophication (excessive algae growth and subsequent decrease of dissolved oxygen) of downstream lakes and impoundments.

There are three forms of inorganic nitrogen that are commonly measured in water bodies: ammonia, nitrates and nitrites. Ammonia and nitrates are the reactive forms for plant uptake. Total nitrogen (TN) is the sum of organic nitrogen, ammonia, and nitrate-nitrite. It can be derived by analyzing for total Kjeldahl nitrogen (TKN) (organic nitrogen), ammonia, and nitrate-nitrite.

2.5.7.3 Total Phosphorus

Total phosphorus (TP) is also an essential nutrient for plants and animals. In waterbodies, phosphorus occurs in two forms, dissolved and particulate. Dissolved phosphorus comes in both soluble reactive and soluble organic (non-reactive) forms. Particulate phosphorus is formed when phosphorus becomes incorporated into particles of soil, algae and small animals that are suspended in the water.

While phosphorus is naturally limiting in most fresh water systems because it is not as abundant as carbon and nitrogen, North Dakota sees elevated concentrations in its waters due to its abundance in most soils and the intensive agriculture land use across the state. Particulate phosphorus naturally bonds to soil particles and as a result can be transported over long distances with eroded soil. Because of this binding property phosphorus often settles with soil particles on the bottom of streams, rivers, and lakes where it becomes unavailable for use by plants until it is both resuspended and mixed with the appropriate concentrations of nitrogen. Soluble phosphorus remains in the water column, available for plant use. Sources of phosphorus include soil and rock, wastewater treatment plants, leaking septic systems, runoff from cropland, fertilized lawns, animal manure storage areas, disturbed land areas, drained wetlands, water treatment, decomposition of organic matter, storm water runoff, and commercial cleaning preparations.

2.5.7.4 TN:TP Ratio

To best understand how nitrogen and phosphorus work together in a waterbody, a description of the concept of limiting nutrients is appropriate. Many studies suggest that a ratio of total nitrogen (TN) to total phosphorus (TP) between 10 and 17 is the optimum value for growth of algae (i.e. proportions of both nitrogen and phosphorus are sufficient for growth). For example, if there was an average TN value of 30 mg/L and an average TP value of 3 mg/L, that would equal a TN:TP of 10. A nutrient in short supply, one that causes this ratio to be above or below this range of values, is called the limiting nutrient.

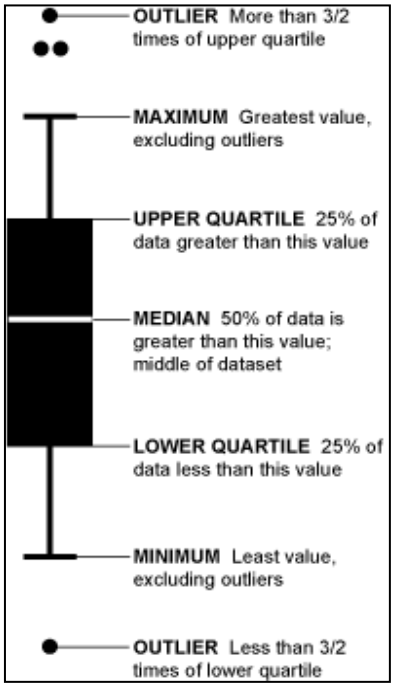
It is generally thought that a TN:TP ratio less than 10 is nitrogen limited and a TN:TP ratio of greater than 17 is phosphorus limited. In most North Dakota waters, nitrogen is the limiting nutrient. This means that once the nitrogen drops to a very low amount, no matter how much phosphorus is still present, rapid uptake by plants will not occur. Calculating this relatively simple ratio can sometimes provide a useful clue as to the relative importance of nitrogen or phosphorus as it affects the abundance of algae in a waterbody.

2.5.7.5 Total Suspended Solids (TSS)

Total suspended solids (TSS) are organic and inorganic solid materials that are suspended in the water and include silt, plankton, and industrial wastes. If high concentrations of suspended solids exist in the waterbody it can lower water quality by absorbing light. The waterbody then becomes warmer and reduces the ability of the water to hold oxygen necessary for aquatic life. When aquatic plants receive less light, photosynthesis decreases and less oxygen is produced. The combination of warmer water, less light, and lower oxygen makes it impossible for some forms of life to exist.

2.5.7.6 Box and Whisker Plots

In descriptive statistics, a box plot or boxplot (also known as a box-and-whisker diagram or plot) is a convenient way of graphically depicting groups of numerical data through their five-number summaries: the smallest observation (sample minimum), lower quartile (Q1), median (Q2), upper quartile (Q3), and largest observation (sample maximum). A boxplot may also indicate which observations, if any, might be considered outliers.



Box plots display differences between populations without making any assumptions of the underlying statistical distribution: they are non-parametric. The spacings between the different parts of the box help indicate the degree of dispersion (spread) and skewness in the data, and identify outliers. Boxplots can be drawn either horizontally or vertically.

Box and whisker plots are uniform in their use of the box: the bottom and top of the box are always the 25th and 75th percentile (the lower and upper quartiles, respectively), and the band near the middle of the box is always the 50th percentile (the median).

Any data not included between the whiskers should be plotted as an outlier with a dot, small circle, or star, but occasionally this is not done. Some box plots include an additional character to represent the mean of the data. On some box plots a crosshatch is placed on each whisker, before the end of the whisker.

2.5.7.6.a Reading a Box-and-Whisker Plot

Let's say we ask 2,852 people (and they miraculously all respond) how many hamburgers they've consumed in the past week. We'll sort those responses from least to greatest and then graph them with our box-and-whisker.

Take the top 50% of the group (1,426) who ate more hamburgers; they are represented by everything above the median (the white line). Those in the top 25% of hamburger eating (713) are shown by the top "whisker" and dots. Dots represent those who ate a lot more than normal or a lot less than normal (outliers). If more than one outlier ate the same number of hamburgers, dots are placed side by side.

2.5.7.6.b Find Skews in the Data

The box-and-whisker of course shows you more than just four split groups. You can also see which way the data sways. For example, if there are more people who eat a lot of burgers than eat a few, the median is going to be higher or the top whisker could be longer than the bottom one. Basically, it gives you a good overview of the data's distribution.

2.5.8 Water Quality Results by Monitoring Station

The water quality monitoring station results are broken down into two basic parts consisting of: (1) trends in E.coli bacteria counts and the relationship to the beneficial use recreation and (2) statistical calculations for total phosphorus, total nitrogen, TN: TP Ratio and total suspended solids.

2.5.8.1 Monitoring Station 384203

Station 384203 is located north of Forman, ND (Figure 5). In total, 22 E. coli bacteria samples were collected in 2015-2017 (Table 3). Water sampling data results indicated that the months of May and June are fully supporting recreational uses, while July data indicated not supporting recreational uses. The data for the months of August and September were not analyzed due to lack of flow during the summer months of 2015-2017.

Table 3. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 384203 (2015, 2016, 2017).

	May		June		July		August	September	
	5/12/2015	30	6/1/2015	20	7/7/2015	80	Insufficient Data	9/27/2017	1600
	5/13/2015	30	6/2/2015	40	7/8/2015	330			
	5/19/2015	20	6/9/2015	30	7/20/2015	70			
	5/20/2015	20	6/10/2015	10	7/21/2015	140			
	5/26/2015	20	6/16/2015	70	7/27/2015	180			
	5/27/2015	20	6/17/2015	20	7/20/2015	1900			
			6/23/2015	50	7/13/2016	890			
			6/24/2015	30					
Geometric Mean	23		29		259				
% Exceeded 409 CFU/100 mL	0%		0%		29%				
Recreational Use Assessment	Fully Supporting		Fully Supporting		Not Supporting			Insufficient Data	

2.5.8.2 Monitoring Station 384204

Station 384204 is located north of Forman, ND (Figure 5, Table 2). In total, 21, E. coli bacteria samples were collected in 2015-2017 (Table 4). The water quality data for site 384204 could only be analyzed for the months of May and June. The recreational use assessment for May indicated that E. coli bacteria concentrations are fully supporting the recreational beneficial use. The month of June water quality data indicates that E. coli bacteria concentrations are not supporting the recreational beneficial use. The remaining months of the recreational season were not analyzed for lack of water quality data due to no flow conditions of Crooked Creek. This is a common characteristic of Class III streams of North Dakota that are reliant on rainfall to maintain flow conditions. Water quality sampling will continue for the remainder of the project and may allow for data to be collected during the remaining months of the recreational season.

Table 4. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 384204 (2015, 2016, 2017).

	May		June		July		August		September	
	5/12/2015	150	6/1/2015	140	7/7/2015	80	8/14/2017	910	9/27/2017	200
	5/13/2015	180	6/2/2015	80	7/8/2015	160	8/21/2017	780		
	5/19/2015	20	6/9/2015	70						
	5/20/2015	60	6/10/2015	900						
	5/26/2015	40	6/16/2015	290						
	5/27/2015	90	6/17/2015	220						
	5/2/2016	10	6/23/2015	50						
	5/4/2016	40	6/24/2015	40						
Geometric Mean	51		132							
% Exceeded 409 CFU/100 mL	0%		13%							
Recreational Use Assessment	Fully Supporting		Not Supporting		Insufficient Data		Insufficient Data		Insufficient Data	

2.5.8.3 Monitoring Station 384038

Station 384038 is located south of Hamlin, ND (Figure 5, Table 2). In total, 36 E. coli bacteria samples were collected in 2015-2017 (Table 5). Monitoring data for site 384038 indicated that through the months of May, June, July and August recreational beneficial uses are not supporting. The month of September was not analyzed due to lack of water quality samples caused by no flow conditions. It is safe to assume that if adequate water quality samples were taken in September the concentrations would indicate a not supporting recreational beneficial use. It is important to note that during the months of July and August concentrations of E. coli bacteria were significantly high, further investigation using Google Earth indicated the existence of a feedlot upstream of the sampling site.

Table 5. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 384038 (2008-2015).

	May		June		July		August		September	
	5/12/2015	1300	6/1/2015	70	7/7/2015	80	8/3/2015	800	9/27/2017	1200
	5/13/2015	620	6/2/2015	180	7/8/2015	200	8/5/2015	900		
	5/19/2015	560	6/9/2015	170	7/13/2015	270	8/11/2015	1900		
	5/20/2015	340	6/10/2015	270	7/15/2015	350	8/10/2015	2300		
	5/26/2015	160	6/16/2015	100	7/20/2015	1000	8/14/2017	3000		
	5/27/2015	580	6/17/2015	280	7/21/2015	320	8/16/2017	1300		
	5/2/2016	40	6/23/2015	30	7/27/2015	1000	8/21/2017	1500		
	5/4/2016	120	6/24/2015	180	7/28/2015	1600				
	5/9/2016	230			7/31/2017	2000				
	5/10/2016	70								
	5/18/2016	400								
Geometric Mean	264		131		487		1516			
% Exceeded 409 CFU/100 mL	36%		0%		44%		100%			
Recreational Use Assessment	Not Supporting		Not Supporting		Not Supporting		Not Supporting		Insufficient Data	

2.5.8.4 Monitoring Station 384206

Station 384206 is located on Shortfoot creek at the North Dakota and South Dakota border south of Geneseo, ND. A total of 30 samples were collected from 2015 to 2017. Monitoring data indicated a fully supporting but threatened recreational use assessment for the month of May. While June was calculated as fully supporting recreational beneficial uses, due to lack of flow during the months of July, August and September sufficient water quality data to calculate a recreational use assessment could not be obtained.

Table 6. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 384206 (2008-2015).

	May		June		July		August		September	
	5/4/2015	10	6/1/2015	100	7/27/2015	240	8/3/2015	140	9/27/2017	270
	5/5/2015	30	6/2/2015	90	7/28/2015	440	8/5/2015	150		
	5/12/2015	400	6/9/2015	80	7/13/2016	2100	8/11/2015	200		
	5/13/2015	540	6/10/2015	150			8/10/2015	150		
	5/19/2015	60	6/16/2015	80						
	5/20/2015	110	6/17/2015	260						
	5/26/2015	580	6/23/2015	80						
	5/27/2015	150	6/24/2015	20						
	5/2/2016	20								
	5/4/2016	30								
	5/9/2016	10								
	5/10/2016	60								
	5/16/2016	5								
	5/18/2016	80								
Geometric Mean	58		88							
% Exceeded 409 CFU/100 mL	14%		0%							
Recreational Use Assessment	Fully Supporting but Threatened		Fully Supporting		Insufficient Data		Insufficient Data		Insufficient Data	

2.5.8.5 Monitoring Station 384037

Station 384037 is located south of Geneseo, ND. Total samples collected from 2015 to 2017 was 39. The sampling data indicates that the months of June, July and August had a number of high E coli bacteria concentrations. Analysis of E. coli bacteria data indicated a fully supporting recreational beneficial use for the month of May. The months of June, July and August E. coli bacteria was not supporting recreational beneficial uses. It appears that July had very high concentrations of E. coli bacteria. The months of June through August form a bell-shaped curve in relationship to E. coli bacteria concentrations. These months are primary grazing months during the summer which patterns the increase in bacteria concentrations. The month of September could not be calculated due to no flow conditions.

Table 7. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 384037 (2008-2015).

	May		June		July		August		September	
	5/12/2015	120	6/1/2015	60	7/7/2015	3400	8/3/2015	490	9/27/2017	1000
	5/13/2015	140	6/2/2015	70	7/8/2015	1600	8/5/2015	2000		
	5/19/2015	200	6/9/2015	110	7/13/2015	500	8/11/2015	40		
	5/20/2015	100	6/10/2015	180	7/15/2015	2600	8/10/2015	5		
	5/26/2015	40	6/16/2015	490	7/20/2015	290	8/14/2017	2800		
	5/27/2015	100	6/17/2015	560	7/21/2015	660	8/16/2017	240		
	5/2/2016	60	6/23/2015	420	7/27/2015	150	8/21/2017	180		
	5/4/2016	180	6/24/2015	600	7/28/2015	280				
	5/9/2016	290			7/13/2016	820				
	5/10/2016	270			7/5/2017	3500				
	5/16/2016	70								
	5/18/2016	520								
	5/23/2016	30								
Geometric Mean	121		221		834		218			
% Exceeded 409 CFU/100 mL	8%		50%		70%		43%			
Recreational Use Assessment	FS		NS		NS		NS		Insufficient Data	

2.5.9 Nutrients, Total Suspended Solids and TN:TP Ratio Results

Monitoring sites on Crooked and Shortfoot Creek were sampled for total phosphorus, total nitrogen, ammonia, total Kjeldahl nitrogen, nitrate+nitrite and total suspended solids. The data collected from 2015 through 2017 was analyzed with the use of box and whisker plots, for more information on box and whisker plots refer to section 7.6. The focus of the analysis will focus on total phosphorus, total nitrogen, total suspended solids and TN:TP Ratio.

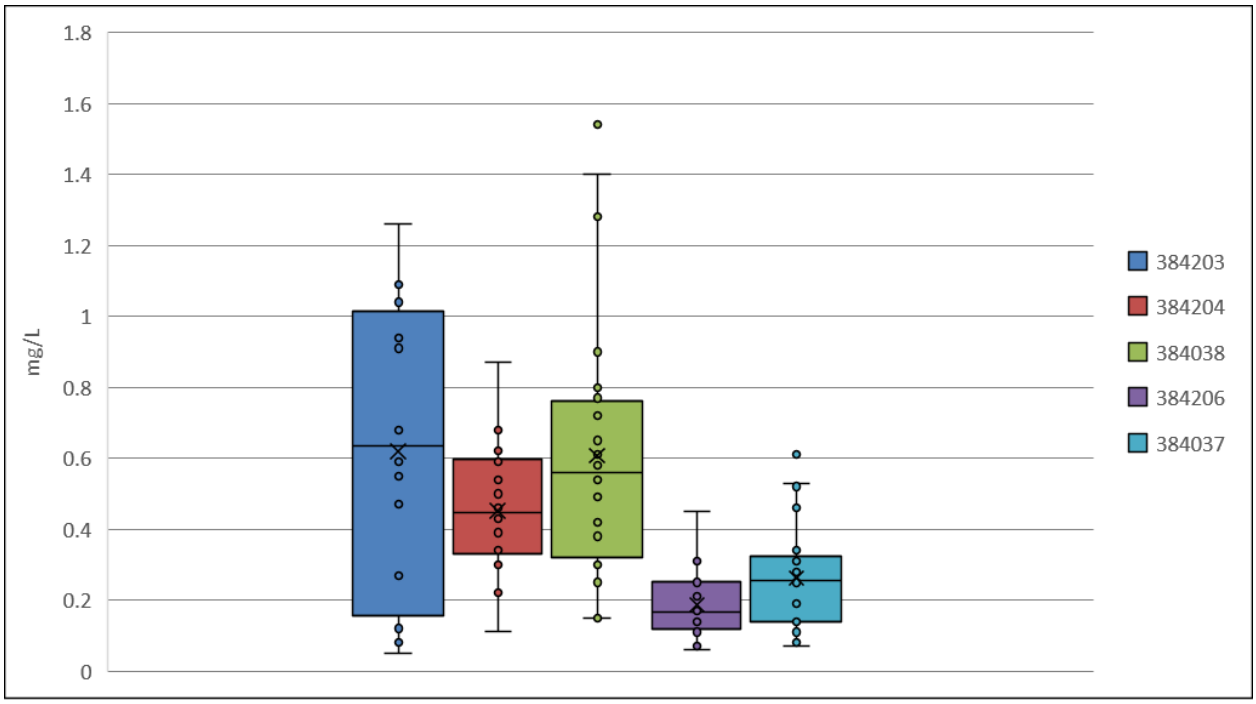


Figure 6. Total Phosphorus Box and Whisker Plot for Crooked Creek and Shortfoot Creek.

2.5.9.1 Total Phosphorus Results

Total Phosphorus concentrations from Crooked Creek appears to have extensive variability throughout the sampling period of 2015 through 2017, in particular site 384203 with concentrations ranging from 0.2 to 1.0 mg/L (Figure 6). Monitoring site 384203 had the median of the data falling at approximately 0.65 mg/L, twenty five percent of the values less than 0.2 mg/L and twenty five percent of values above 1.0 mg/L.

Site 384204 water quality results indicate that the median of the data falls above 0.4 mg/L, twenty five percent falls less than 0.3 mg/L and twenty five percent falls above 0.6 mg/L. Site 384038 also had extensive variability in total phosphorus concentrations with median of the data below 0.6 mg/L, twenty five percent of the data is less than 0.3 mg/L and twenty five percent of the remaining data falls above 0.8 mg/L (Figure 6).

Shortfoot Creek total phosphorus concentrations had less variability when compared to Crooked Creek during the same sampling period of 2015 to 2017. Monitoring site 384206 sample data indicated that median of the data falls above 0.1 mg/L, while twenty five percent of data falls below 0.1 mg/L, and the remaining twenty five percent of data falls above 0.3 mg/L (Figure 6).

Monitoring site 384037 was characterized with median total phosphorus sample results above 0.3 mg/L, while twenty five percent of the samples were below 0.1 mg/L, and the remaining twenty five percent of samples higher than 0.35 mg/L (Figure 6).

The total phosphorus concentrations for Crooked Creek and Shortfoot Creek are highly variable, influences in these watersheds likely stems from intensive cultivation of cropland in close proximity to the stream channel. Over fertilization of cropland, intensive cultivation and reduced or absent riparian vegetation will have an effect on the transport of phosphorus from cropland into the waterbody. Wetlands within the watershed are also intensively cultivated around which effects the function and essential environmental services these areas provide to the cycling and transport of phosphorus in the watershed.

Other potential sources could include unpermitted animal feeding operations, springs, lack of efficient nutrient cycling, and accumulation of nutrients in stagnant pools during a long period of low flow conditions, septic systems, and lake discharge.

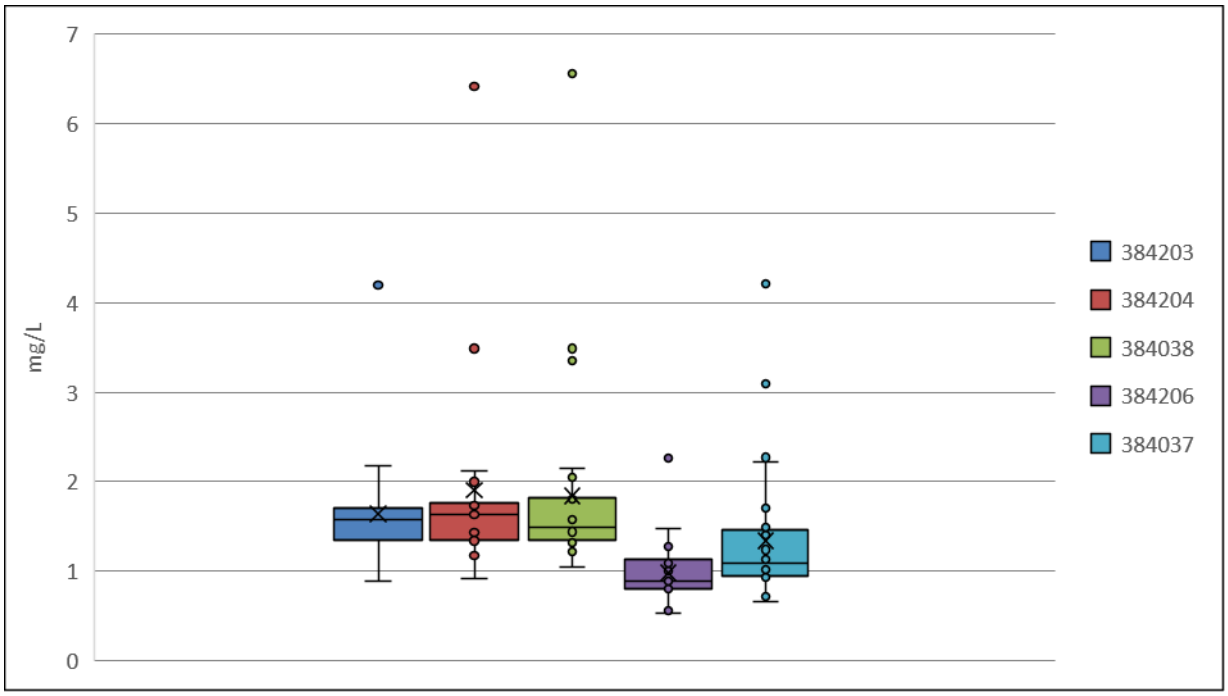


Figure 7. Total Nitrogen Box and Whisker Plot for Crooked Creek and Shortfoot Creek.

2.5.9.2 Total Nitrogen Results

Total nitrogen sampling results indicated very little variability during the sampling period or between sampling sites within the two watersheds. The total nitrogen concentrations in the Crooked Creek watershed were slightly higher than in Shortfoot Creek. It is interesting to note that sampling results for sites 384203, 38420, and 384038 have similar median values of data largely falling within 1.4-1.5 mg/L, while twenty five percent of data results fall above 1.7 mg/L and twenty five percent of data falls below 1.35 mg/L (Figure 7).

Shortfoot Creek monitoring sites 384206 and 384037 are relatively similar in variability of total nitrogen in the watershed. The only difference would be that monitoring site 384037 has slightly more variable total nitrogen concentration most likely due to is location near the confluence with the Wild Rice River. Water quality monitoring site 384206 had total nitrogen concentrations ranging from 0.8 to 1.1 mg/L and a median value of 0.88 mg/L. Site 384037 had a total nitrogen concentration range of 0.95 mg/L to 1.5 mg/L and a median value of 1.09 mg/L (Figure 7).

Crooked Creek and Shortfoot Creek have similar characterizations when it pertains to total nitrogen and its interactions within the watersheds. The data indicates that total nitrogen does not vary as much as total phosphorus. Potential contributing sources of nitrogen into the creeks could include over fertilization, soil erosion, animal manure, septic systems, and tile drainage.

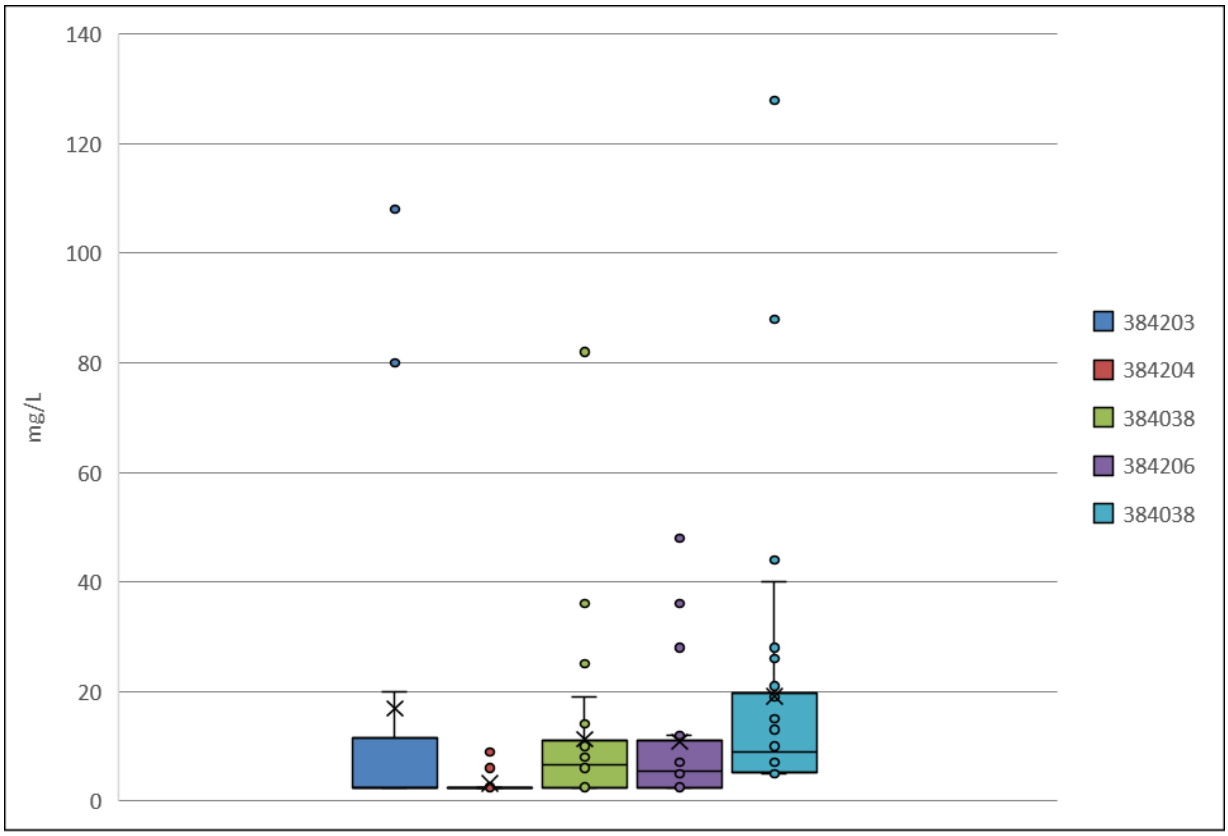


Figure 8. Total Suspended Solids Box and Whisker Plot for Crooked Creek and Shortfoot Creek.

2.5.9.3 Total Suspended Solids Results

Total suspended solids data results indicate that sediment appears to not be the driving factor in delivery of nutrients into the Crooked Creek. The range of values for Crooked Creek monitoring sites 384203, 384204, and 384038 were very different from one another. Site 384203 has a range of values from 2.5 to 11.5 mg/L. While site 384204 had no variability with very few samples with detects higher than 5.0 mg/L. Monitoring site 384038 did have some variability of sample data with a range of 2.5 to 11.0 mg/L and a median value of 6.5 mg/L.

Shortfoot Creek total suspended solids data shows that sediment has some effect on the transport of nutrients into the waterbody. Monitoring site 384206 total suspended data ranged in from 2.5 to 11.0 mg/L. The median value is 5.5 mg/L, upper quartile of 11.0 and lower quartile of 2.5. Monitoring site 384037 had a upper quartile value of 20.0 mg/L, lower quartile of 5.25 mg/L and a median value of 9.0 mg/L. Shortfoot Creek is experiencing a runoff and sediment driven nutrient transport and also algal response from total phosphorus and nitrogen in the channel.

2.5.9.4 Total Nitrogen: Total Phosphorus Ratio

As described in Section 7.5 of the document TN:TP ratio is a simple calculation to further explain the function of nutrients in Crooked and Shortfoot Creek. A simple equation was calculated and the data was grouped together by year and sample site. Both watersheds exhibit nitrogen limitation throughout most of the sampling years. This is common throughout the State it means that there is a excessive amount of phosphorus within the creek system that is not being utilized by plants. When the right amount of nitrogen is introduced into the system plants and algae begin to utilize both nutrients for growth. This optimum condition does occur a few times at each sampling site. Monitoring site 384203 did become phosphorus limited once during the sample period which was in October of 2017, this could be the result of fall nitrogen fertilizer application. Refer to Figures 9, 10, 11, 12, and 13.

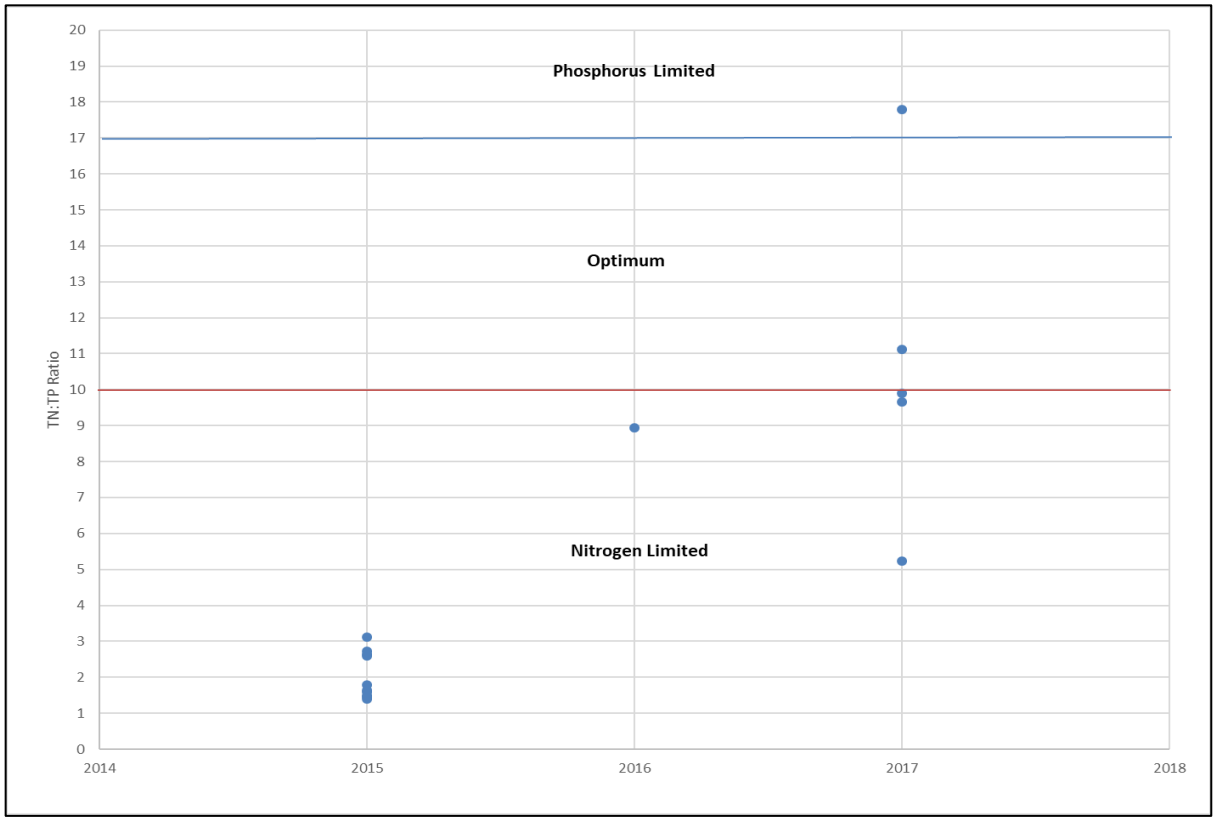


Figure 9. TN:TP Ratio Trends for Monitoring Site 384203.

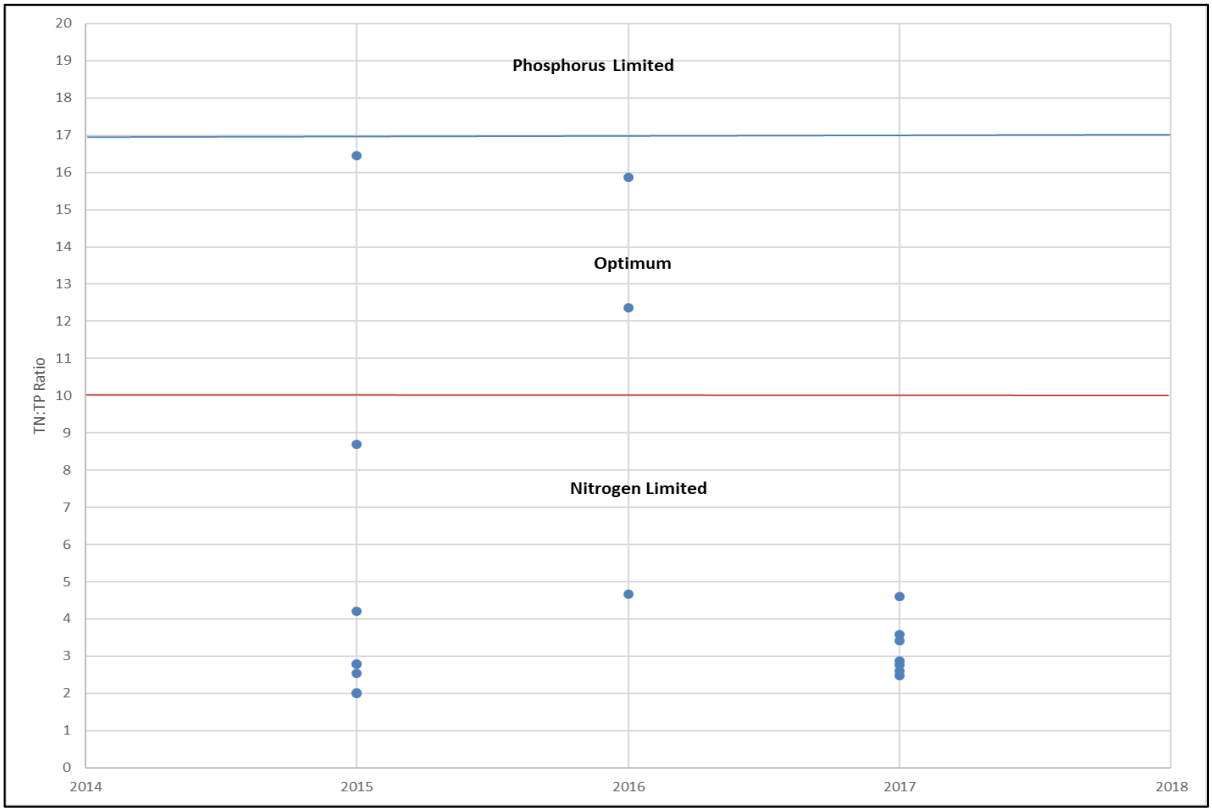


Figure 10. TN:TP Ratio Trends for Monitoring Site 384204.

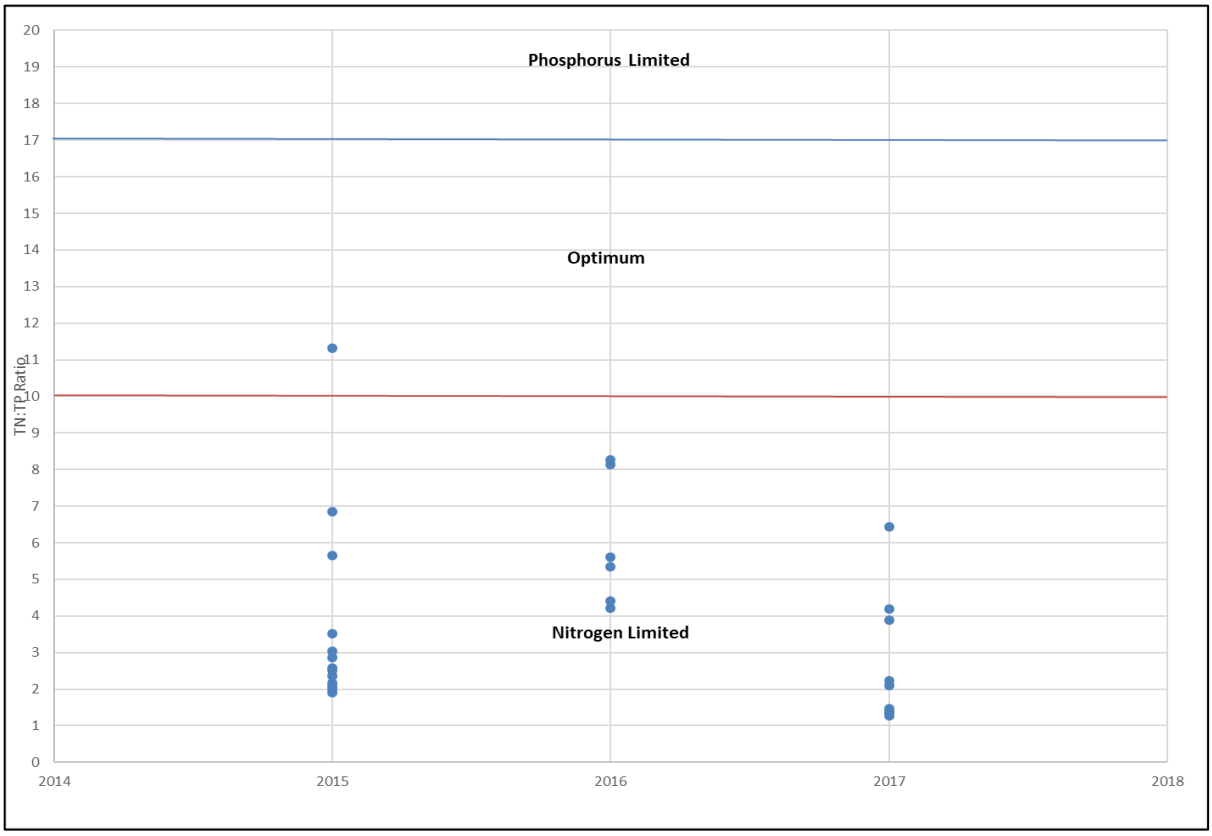


Figure 11. TN:TP Ratio Trends for Monitoring Site 384038

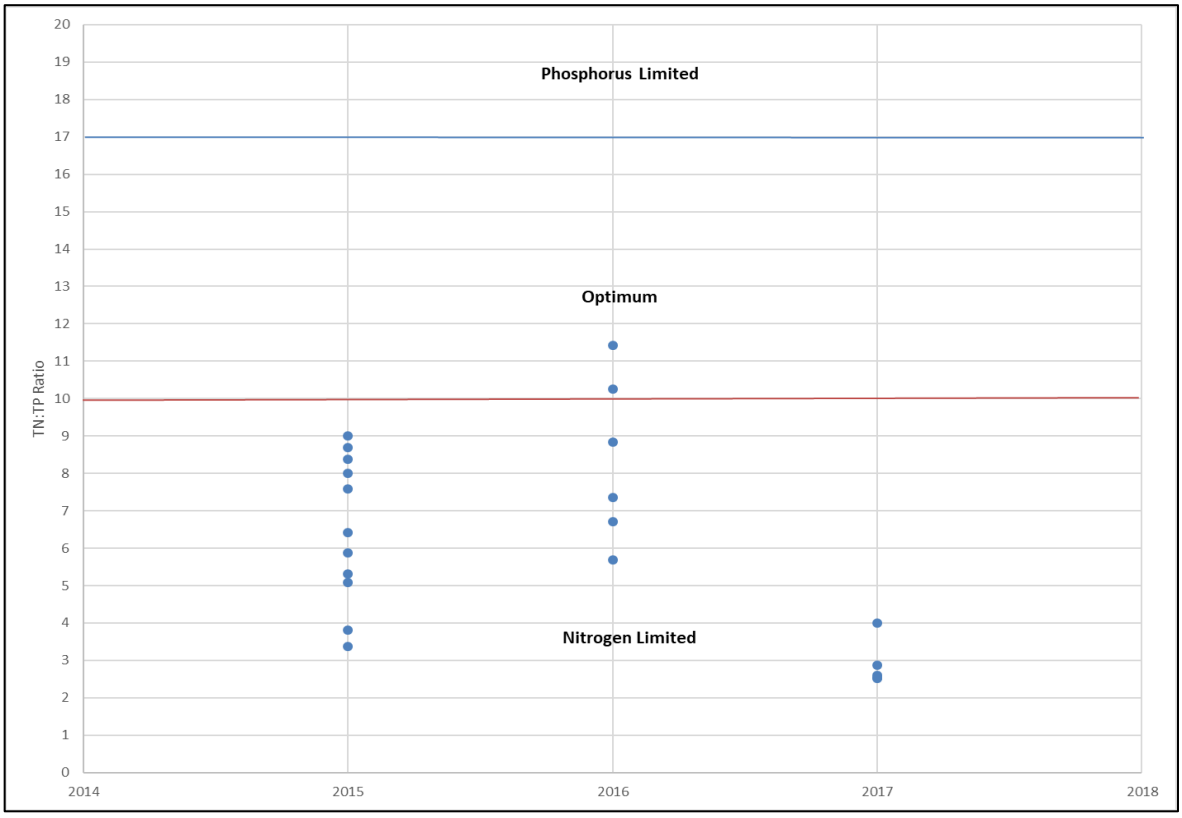


Figure 12. TN:TP Ratio Trends for Monitoring Site 384206.

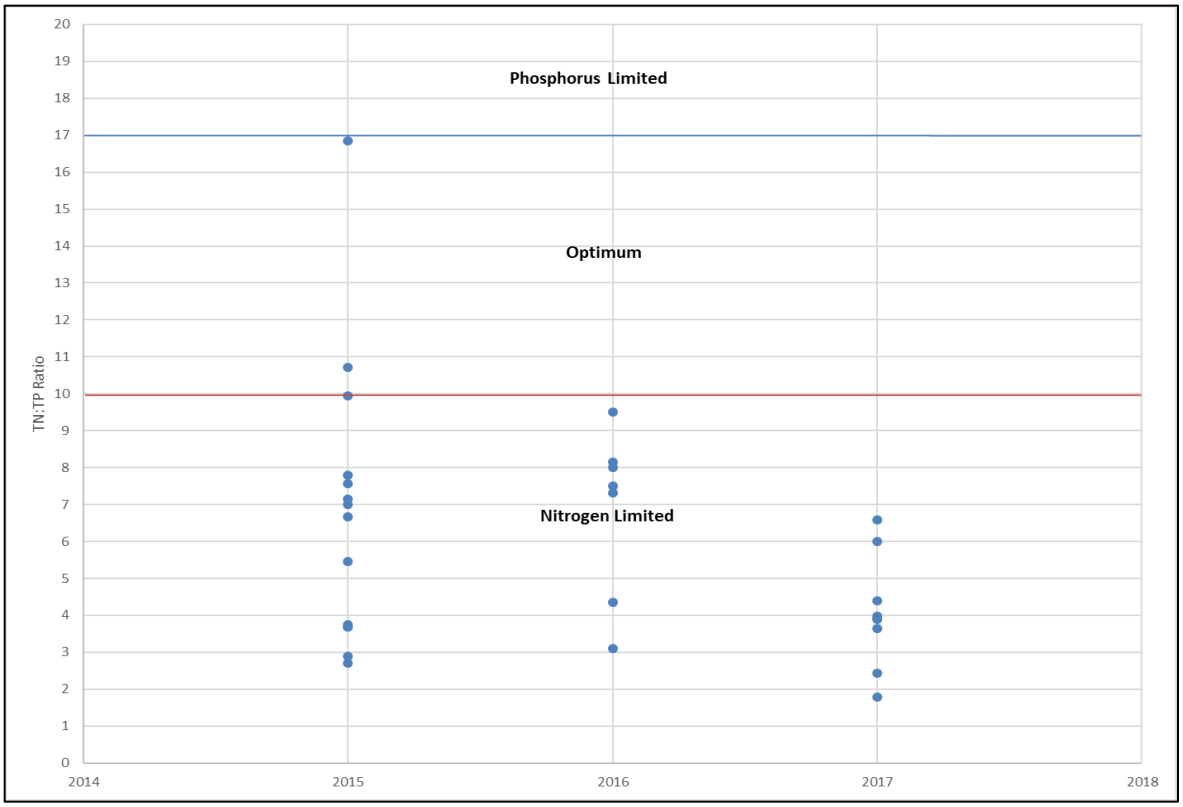


Figure 13. TN:TP Ratio Trends for Monitoring Site 384037.

2.5.10 Conclusion

A lack of samples taken in the late summer months was because of dry weather and isolated rainfall throughout the county. No and low flow conditions in late summer are a characteristic of a flashy stream that is driven by precipitation. Due to this characteristic of Crooked and Shortfoot Creek dry weather will have a significant effect on quantity of samples and ultimately affect the improving trend of beneficial uses in the months of July, August and September. Best management practices should be used to account for flushing rainfall events that will slow or prevent nutrients and E. coli bacteria from being transported into the stream system.

The function of nutrients in these two watersheds is extremely varied. Precipitation amounts, duration and timing play a crucial role in how nutrients are transported and utilized within the creek. Analyzing the water quality data gathered on Crooked and Shortfoot Creek indicate that phosphorus plays a vital role in the chemistry of the waterbodies.

Although, total phosphorus was the analyte sampled it appears that dissolved phosphorus seems to be the main form of phosphorus in these waterbodies. Justification for this is described in the box and whisker plots for phosphorus and total suspended solids and the TN:TP ratio calculations. Due to low TSS concentration is the waterbodies it is presumed that sediment is not the driving force in the transport of phosphorus into the system which would account for the particulate phosphorus.

Further sampling of each watershed and including dissolved phosphorus into the sampling regime would help determine the amount present in the waterbodies.

There are a variety of potential sources that have an effect on nutrients in the Crooked and Shortfoot Creek watersheds including runoff from unpermitted feedlots, tile drainage, natural springs, lake and wetland discharge, and in channel discharge from the flushing of stagnant pools.

Further, analysis of land uses will continue to help implement specific best management practices (BMPs) to account for dry and wet weather cycles within the watershed thereby improving the beneficial use of the latter half of the summer.

The current BMPs implemented during the project period have improved the landscape overall in each of these watersheds, but due to the variable dynamics in flow, precipitation, land use, and chemistry the data analyzed has not indicated an improving water quality trend.

2.5.11 Index of Biotic Integrity (IBI) Summary for Sargent County

Aquatic macroinvertebrates are the most common organisms used in water quality assessments. Human disturbance of streams and landscapes alter key attributes of the aquatic environment, (i.e., water quality, flow regime, habitat structure) which elicits a response from the macroinvertebrate community and can ultimately result in decreased biotic integrity. For example, if pollutants enter a waterway, sensitive species will suffer while tolerant species will continue to thrive. Changes in species composition such as this can easily be detected through index development.

An Index of Biotic Integrity (IBI) is a multi-metric index designed and calibrated for specific regions. A metric is simply an expression of the biological community. The score is a qualitative rating such as good, fair or poor that can be associated with each site for an overall indication of biological integrity.

Table 3. Reference Based Thresholds Used to Determine Condition Class in the Northern Glaciated Plains Ecoregion (46) of the Red River Basin in North Dakota.

	Fully Supporting	Fully Supporting but Threatened	Not Supporting
Percentile Value	25th Percentile > 70	NA 70 -59	5th Percentile < 59

Table 4. IBI Scores for Macroinvertebrate Sampling Locations in the Wild Rice River Drainage in Sargent County, ND.

Station ID	Waterbody Name	Date	IBI Score	Condition Class
551249	Wild Rice River	26-Jun-02	53	Not Supporting
551249	Wild Rice River	31-Aug-09	45	Not Supporting
551251	Shortfoot Creek	26-Jun-02	32	Not Supporting
551251	Shortfoot Creek	01-Sep-09	44	Not Supporting
551252	Crooked Creek	26-Jun-02	16	Not Supporting
551252	Crooked Creek	01-Sep-09	14	Not Supporting
551375	Wild Rice River	17-Sep-07	61	Fully Supporting but Threatened
551376	Wild Rice River	17-Sep-07	70	Fully Supporting but Threatened

The macroinvertebrate IBI scores for Wild Rice River, Crooked Creek, and Shortfoot Creek indicate that the river systems are impaired for aquatic life. This correlates with the nutrient data for the same areas which also indicates nutrient water quality impairment. These areas are an important focal point for implementation of conservation practices.

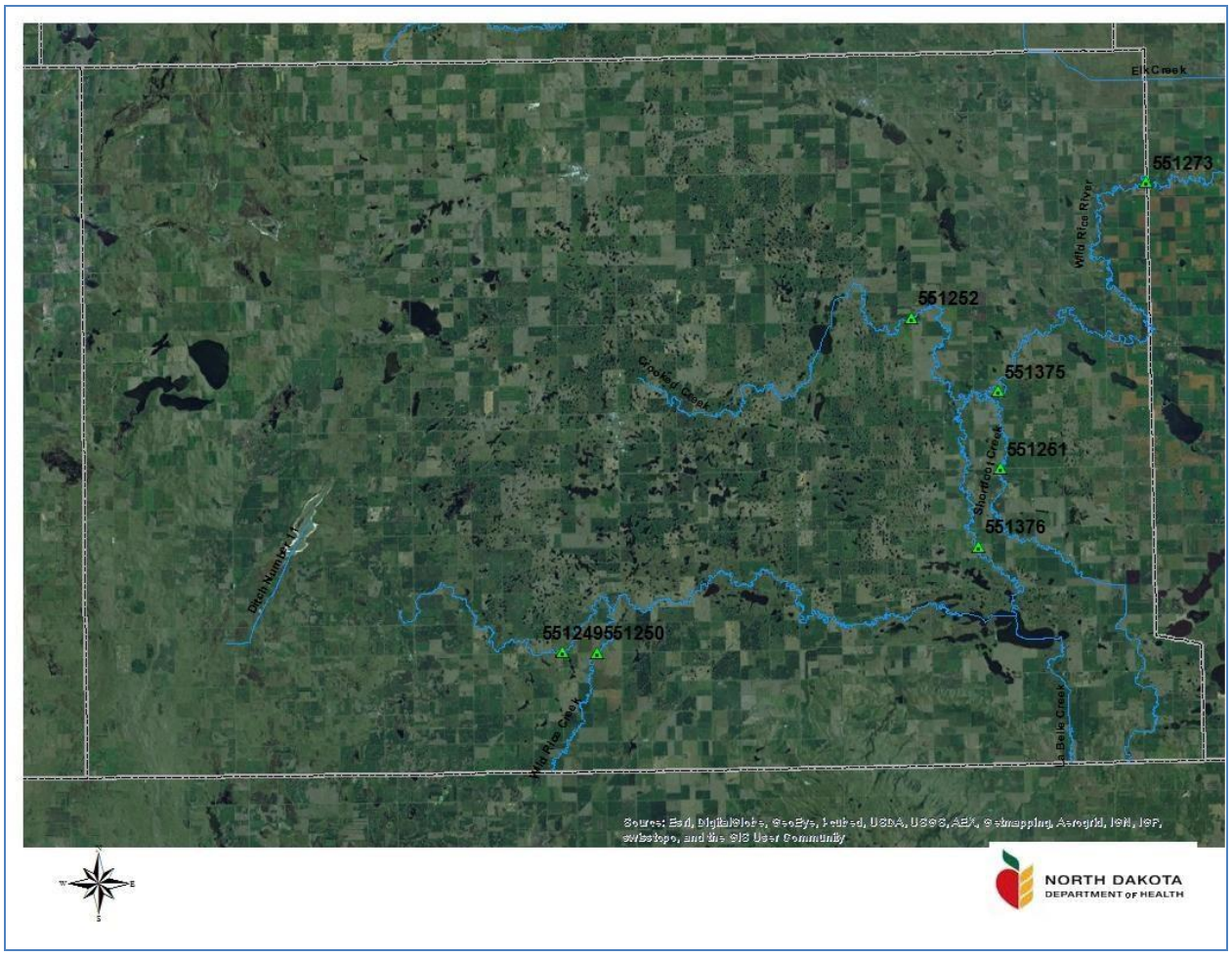


Figure 12. Sargent County Macroinvertebrate Sampling Locations.

3.0 PROJECT DESCRIPTION

3.1 Goal for the Project: The goal of the project is to restore riparian habitat and buffering capabilities in Crooked and Shortfoot Creek watersheds as well as along the mainstem of the Wild Rice River in Sargent County to improve aquatic life uses in the creeks and river. As a secondary goal, livestock and cropland management immediately adjacent to the creeks and river will also be addressed to improve recreational uses; as well as to enhance/protect the function of the riparian corridor.

3.2 Objective 1: Increase the IBI Score for the specific reaches being addressed by the project to achieve a fair to good ranking (>70 for good and 59-70 for fair)

Task 1. SCD will employ personnel to manage the project during the grant period. Responsibilities will include BMP inventories, producer contacts, and water quality sampling.

Product: 1 Full-Time Watershed Coordinator
Cost: $102,000

Task 2: Utilize the Decision Support Tool and/or PTM App to identify priority areas for BMP implementation at the field level.

Product: 10 Field scale priority maps for cooperating producers as well as conservation plans utilizing BMP's to increase water quality.
Cost: Staffing cost (Task 1)

Task 3: Restore, protect, and maintain approximately 400 acres (10 miles of riparian corridor) along the Wild Rice River, Shortfoot Creek, and/or Crooked Creek by installing/maintaining easements and/or implementing BMP's such as grassed waterways, filter strips and trees. The easements may have an effective life span of up to 10 years. See Appendix E for an easement example.

Product: WRSCD Water Quality Easement and Erosion Control BMP's on 400 acres
Cost: $58,580

Task 4: SCD and landowners will develop cropland management plans on 1300 acres of cropland. The plans will include BMP's such as conservation crop rotation, cover crops, nutrient management, residue management and soil testing.

Product: Cropland Management BMP's on 1300 acres
Cost: $16,000

Task 5: SCD and landowners will work to implement BMP's and develop grazing management plans. These BMP's will include fencing, pipelines, wells, spring development, prescribed grazing, solar pumps, tanks, troughs, portable windbreaks and/or winter grazing plans on an estimated 250 acres. The placement will be on the riparian corridor of the Wild Rice River as well as Crooked and Shortfoot Creeks.

Product: Technical and Financial Assistance on Grazing Management BMP's on 4 grazing systems
Cost: $18,200

3.2: Objective 2: Increase the awareness of rural and urban residents of practices and daily activities that can be implemented to help achieve and maintain fully supporting status of the recreational and aquatic life uses of the Wild Rice River

Task 6: The Watershed Coordinator will conduct public meetings/notifications yearly on watershed accomplishments.

Product: Annual Report & Program Information Meetings, 10 one-on-one personal contacts
Cost: $200

Task 7: The SCD will disseminate information to increase producer awareness of practices and/or management systems that can be implemented to improve management of nutrients, riparian areas, and livestock manure; as well as improve soil health and reduce erosion.

Product: A biennial ladies Ag night, 8 District Newsletters, and annual newspaper articles in the Sargent County Teller.
Cost: $200

Task 8: The Watershed Coordinator will implement a conservation education program with local schools on watersheds and water quality as related to Wild Rice River Restoration and Riparian Project. Specific activities will be determined through planning between watershed coordinator and interested teachers.

Product: 2 – Envirothon, 2 – ECO ED Day, 2 – First Grade, 2 – Third Grade
Cost: $200

3.2: Objective 3: Maintain funding support thru October 2020 for the Conservation Cropping System Project Farm (CCSP) as a demonstration site to increase producers' awareness and understanding of: 1) soil health management; 2) connection between water quality and soil health; and 3) feasible options for improving soil health under different crop rotations. See Appendix C for a list of CCSP Board of Directors and Appendix D for a list of contributing sponsors of the CCSP Farm.

Task 9: Coordinate with the CCSP advisory board to establish larger plots and new crop rotations on the CCSP Farm to focus on what was learned on the small plots previously used on the farm. The demonstrations on the larger plots will focus on soil health improvement using winter annuals as cover and cash crops, cover crop seeding

techniques in standing crop, and establishment of a year-round "living root" crop rotations. We will also be implementing grazing and/or haying practices on cover crops to showcase the added forage value to cattle producers.

In addition to 319 grant, the CCSP farm in conjunction with the Wild Rice Soil Conservation District has a cooperative agreement to the Natural Resources Conservation Service to help maintain operations as well.

Product: 1 pasture plot and 1 cropland plot on the new site in Oakes that can be divided up as needed. See Appendix B for an overview of CCSP Farm operations and Appendix J for a map of the Oakes site.

Cost: Support (TA & FA) is listed on Wild Rice Restoration and Riparian Project Phase III Part 1: Funding Source. See Appendix G. This item strictly lists In-Kind and Donations for match. There are no direct 319 Funds being allocated to Task 9.

Task 10: CCSP Farm Board will employ an agronomist to implement, coordinate, and oversee activities on the CCSP Farm. The Farm Manager will dedicate 16 hours/month towards the CCSP Project and will be compensated through the Wild Rice River Restoration and Riparian Project Phase III.

Product: .1 PTE Staff
Cost: $6,281.60

Task 11: The CCSP Farm Board will lease 50 acres of cropland to serve as a demonstration site to showcase the positive impacts that crop rotation, cover crops, and strip/no-till practices on a producers operation. The CCSP Farm Board will also lease 140 acres of pastureland to highlight grazing practices as well with the goal of creating a rotational grazing system by dividing up the pasture into multiple paddocks and expanding current water supply to move away from season-long grazing

Product: Lease 50 acres of cropland at $150/acre/year and 24 acres of pastureland at $50/acre/year to utilize as a demonstration plot through 2020. The producer will also let us utilize an additional 116 acres of pastureland valued at $50/acre/year as his 40% match.
Cost: $29,000

Task 12: Organize and conduct scheduled information and education (I/E) events focusing on NPS pollution control within agricultural areas and coordinate them with ongoing state/federally sponsored I/E programs. Farm Manager and Watershed Coordinator will participate in 2 – No-Tillage Workshops, 6 – Tours of CCSP, and 2 – professional presentations.

Product: Display and inform producers and resource professionals about cover crops, rainfall simulator, and no-till equipment through presentations and CCSP on-farm events.
Cost: Staffing Cost. See Task 1 & 11

Task 13: Identify options for establishing edge-of-field monitoring sites on the CCSP Farm to evaluate the relationship between various crop rotations and surface water quality, cover crops, and/or soil health systems. This will involve the sizing of plots to conform to small watersheds on site and potential use of a sprinkler irrigation system to simulate rainfall events.

Product: Plan and schedule for establishing edge-of-field monitoring sites
Costs: Plan development will be covered under Task 10 Costs. Establishment of the monitoring sites will be delivered within the NRCS Cooperative Agreement with the CCSP Farm.

3.3 See Attached Milestone Table in Appendix F

3.4 Permits: All necessary permits will be acquired. These may include CWA (Clean Water Act) Section 404 permits. Project sponsors will work with NDDH to determine if National Pollution Elimination System permits are needed for the proposed livestock systems.

***3.5* Lead Project Sponsor** Wild Rice Soil Conservation District (WRSCD) is the lead sponsor. Wild Rice SCD has sponsored three 319 projects. The WRSCD's annual and long range plans help to prioritize and guide the field service staff. The WRSCD has legal authorization to employ personnel and receive and expend funds. They have a track record for personnel management and addressing conservation issues for their constituency. The Sargent County Water Resource Board is responsible for the management of water resources in Sargent County. They will provide support for the project as well as assist the WRSCD in overseeing the projects progress.

3.6 Operation and Maintenance The Wild Rice SCD will be responsible for auditing Operation and Maintenance Agreements (O&M) for Section 319 cost shared BMP through yearly status reviews of EPA Section 319 contracts. The lifespan of each BMP will be listed in each individual contract to ensure 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 it lifespan. The Wild Rice Soil Conservation District Water
Quality Easement will be filed, with the County Office Recorder at the Sargent County Count
House. The original document will be filed in a custody file at the Wild Rice Soil Conservation District Office. See Appendix E (The easement and the process are currently being reviewed to ensure clarity and management objectives with the Wild Rice Soil Conservation District and the landowner).

4.0 Coordinating Plan

4.1 Cooperating Organizations The WRSCD is the signer of 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 board (WRSCD) will be the primary supervisors of the watershed conservationist and all Section 319 funded activities.

4.1b The Sargent County Water Resource Board (SCWRB) will assist the WRSCD in project implement and provide negotiable financial support.

4.1c Sargent County Commission (SCC) - The Sargent County Commission has agreed to support this project.

4.1d. NRCS: NRCS has entered into a contribution agreement with the CCSP Farm to help showcase conservation practices to producers by providing funding to create two new "satellite" CCSP locations in southeast North Dakota within two producers operations. They will contribute $225,000 towards the CCSP Farm project over the next four years to get these satellite locations up and running. With a proven track record of producers adopting practices that has led to improved water quality in the Shortfoot Creek watershed the hopes are to keep the trend moving upwards. Environmental Quality Incentives Program (EQIP) will be used to plan relevant conservation practices not supported by the 319 grant. Some projects, like animal waste systems, can include several cost-sharable conservation practices. The 319 project dollars will be used to cover areas, practices, or landowners not addressed though EQIP.

4.1e North Dakota Department of Health (NDDH). The NDDH will oversee 319 funding as well as develop the Quality Assurance Project Plan (QAPP) for this project. NDDH will provide training for proper water quality sample collection, preservation and transportation, to ensure reliable data is obtained. It will provide the sponsor over sight to ensure proper management and expenditure of Section 319 funds. They will assist NRCS and SCD personnel in the review of O&M requirements for section 319 cost shared BMP's.

4.1f Farm Services Agency (FSA) - Programs available through FSA will be pursued for cost share assistance.

4.1g North Dakota State University Extension Service (EXT) - Local and State personnel and educational materials will be utilized to compliment the projects I/E activities. This will include such things as specific BMP publications and assistance with workshops and field tours. The specific role of EXT will be dependent on the type of I/E activity being implemented and availability of staff and materials. Staff at the Oakes Irrigation Site will also coordinate with the CCSP Farm on research and demonstration of on-farm operations and may also assist with field work if time and staffing permits.

4.1h USFWS Programs and technical assistance available through USFWS will be pursued for project assistance.

4.1i Ducks Unlimited Inc. (DU) - DU has agreed to support the CCSP project financially.

4.1j Pheasants Forever (PF) – PF has received funding through the EPA, the North Dakota Game and Fish Department, and the North Dakota Department of Health for their Precision Ag program. Watershed Coordinator will work with PF to deliver eligible BMP's through the Precision Ag program.

4.1k The Conservation Cropping System Project (CCSP) board, with the assistance of the Advisory board will oversee the implementation of the demonstration farm.
Appendix C - advisory members and Appendix D for sponsors.

4.2 Local Support The WRSCD Board has concerns for the Sargent County community at large. All the board members are on township boards, we have one board member on the SCWRB. Spring 2015, there has been a total of 197 producers/landowners participating in the implementation of BMP.

4.3 Partnership The WRSCD will work with multiple partners (e.g., NRCS, other SCDs, WRD, Extension Service, CCSP Farm, etc.) to increase awareness of solutions to water quality and NPS pollution issues in the area. This will be accomplished through educational events and/or demonstrations that focus on the benefits various conservation practices. They will also provide in protecting soil resources, improving air and water quality, enhancing fish and wildlife habitat, and improving nutrient and rangeland management. Some of these events may include; an annual cover crop tour; biennial ladies Ag night; 4 annual newspaper articles, 1 annual radio program, and yearly display boards in county businesses and the county fair.

4.4 Similar Activities N/A

5.0 EVALUATION AND MONITORING PLAN

The project sponsors are currently coordinating with the ND Department of Health to develop the Quality Assurance Project Plan (QAPP). The QAPP will be included in the final PIP when it is fully approved.

6.0 BUDGET

6.1 See Appendix G, the budget worksheet.

7.0 PUBLIC INVOLVEMENT

The Wild Rice Watershed Program has a past history of watershed projects. The success of the program has secured public involvement on a widespread basis. The Wild Rice Restoration and Riparian Project Phase II and Sargent County SCDs are active in youth education. The county sponsors an ECO-ED Day every year for middle school children. The purpose of the camp is to help stimulate the need for natural resource conservation. Public tours and demonstrations are held each year to inform the public on various conservation issues such as no-till farming, strip tillage, cover crops. The Wild Rice Restoration and Riparian Project Phase III will be handled in a manner similar to that of other projects. With this, local project staff feels that public involvement is guaranteed.

Appendix A
Historical BMP's Implemented
Page 1 of 2

Best Management Practices Supported with Section 319 funds in the Wild Rice River Watershed

Category/Practice	Amount	Units	Cost Share	Producer Match	Total Cost
Cropland Management					
Cover Crop	2,220.90	Acres	$11,495.64	$7,663.76	$19,159.40
Nutrient Management	31,369.90	Acres	$96,244.58	$64,163.72	$160,408.30
Residue Management (Mulch Till)	19,624.30	Acres	$89,956.76	$59,970.84	$149,927.60
Residue Management (No-Till and Strip Till)	5,395.00	Acres	$35,257.80	$23,504.20	$58,762.00
		Total	**$232,954.78**	**$155,302.52**	**$388,257.30**
Grazing Management					
Fencing	693.00	Linear Feet	$196.00	$130.00	$326.00
Fencing (Woven Wire)	2,160.50	Linear Feet	$2,138.89	$1,425.93	$3,564.82
Pasture/Hayland Planting	28.00	Acres	$343.00	$228.00	$571.00
Pipelines	9,916.94	Linear Feet	$7,662.61	$5,108.41	$12,771.02
Pond	1.00	Number	$1,860.00	$1,240.00	$3,100.00
Prescribed Grazing	320.00	Acres	$960.00	$640.00	$1,600.00
Solar Pumps	1.00	Number	$2,763.60	$1,842.40	$4,606.00
Trough and Tank	6.00	Number	$4,629.89	$3,086.58	$7,716.47
Well (Livestock Only)	5.00	Number	$11,925.05	$7,950.04	$19,875.09
		Total	**$32,479.04**	**$21,651.36**	**$54,130.40**
Vegetative Buffers					
Filter Strip	80.80	Acres	$6,970.85	$4,647.24	$11,618.09
		Total	**$6,970.85**	**$4,647.24**	**$11,618.09**

Appendix A

Historical BMP's Implemented

Page 2 of 2

Category/Practice	Amount	Units	Cost Share	Producer Match	Total Cost
Livestock Manure Management System (Full System)					
Irrigation System (site-specific approval required)	1.00	System(s)	$15,000.00	$10,000.00	$25,000.00
Phase I Waste Management System	1.00	System(s)	$70,000.00	$46,666.67	$116,666.67
Phase II Waste Management System	1.00	System(s)	$14,710.20	$9,806.80	$24,517.00
Waste Management System (Coordinated With EQIP)	5.00	System(s)	$294,001.78	$196,001.20	$490,002.98
		Total	**$393,711.98**	**$262,474.67**	**$656,186.65**
Livestock Manure Management System (Partial System)					
Portable Windbreaks	384.00	Linear Feet	$8,568.00	$5,712.00	$14,280.00
Trough and Tank	1.00	Number	$774.27	$516.18	$1,290.45
Well (Livestock Only)	1.00	Number	$1,687.70	$1,125.14	$2,812.84
Windbreak Fencing (Ag Waste)	650.00	Linear Feet	$4,284.00	$2,856.00	$7,140.00
		Total	**$15,313.97**	**$10,209.32**	**$25,523.29**
Miscellaneous Practices					
Miscellaneous (Full Manure Management System)	1.00	Misc	$4,755.30	$3,170.20	$7,925.50
Miscellaneous (Miscellaneous Practices)	1.00	Misc	($36.00)	($24.00)	($60.00)
Solar Pumps	2.00	Number	$5,078.21	$3,385.47	$8,463.68
Well Decommissioning	12.00	Number	$8,895.20	$5,929.80	$14,825.00
		Total	**$18,692.71**	**$12,461.47**	**$31,154.18**
Riparian Area Management					
Miscellaneous (Riparian Area Management)	5.00	Misc	$48,950.67	$32,633.77	$81,584.44
Riparian Easement (On Cropland)	418.80	Acres	$95,917.15	$63,944.77	$159,861.92
Riparian Herbaceous Cover	23.50	Acres	$1,250.95	$833.97	$2,084.92
		Total	**$146,118.77**	**$97,412.51**	**$243,531.28**
		Grand Total	**$846,242.10**	**$564,159.09**	**$1,410,401.19**

Appendix B
CONSERVATION CROPPINGS SYSTEMS PROJECT DESCRIPTION

The Conservation Cropping Systems Project (CCSP) board is composed of local producers representing counties with the targeted region from both sides of the ND - SD border. Professionals from agricultural research, as well as natural resources conservation agencies, and non-profit interest groups will assist the directing board with technical advice and support. The projects activities will take place on a 190-acre conservation demonstration farm located 3 1/2 miles south of Oakes, ND. We are also expanding our operation to work with two new producers to create 50 acre demonstration sites on their operations in the hopes that we can showcase improvements to them where they will then adopt practices like crop rotation, cover crops, and no-till/strip till across their entire operation.

The mission of the Conservation Cropping Systems Project is to evaluate and demonstrate profitable crop rotations and crop management strategies that are uniquely adapted to the local climate. These strategies will strive to protect the natural resources of southeast North Dakota and northeast South Dakota through research, demonstration and education. The most unique thing about the CCSP Farm is that it is not only broadly supported by SCD's across southeast North Dakota and northeast South Dakota; but it is also supported by many ag-related businesses locally which really increase buy-in from the local community. If you look at Appendix I we have created a summary of our In-Kind and Cash donations from 2016 for the CCSP Farm which we have used to estimate In-Kind for the CCSP Farm over the next two years.

The Conservation Cropping System Project will now focus on using larger plots. We will take what we have learned in the past years, move that knowledge forward, and incorporate recent and experimental technologies. The large plots will be more efficient to work with, better for weed control, and less likely to have herbicide drift issues as well as provide more of a real world example of implementation of practices. Rotations ideas including yearlong cover crops as a forage supplement for grazing or haying as well as incorporating flying on rye onto late season crops. These practices will allow producers who lack early season cover crops in their rotation to still utilize cover crops and create a "continuous live root". We are also exploring options for planting cover crops during the growing season as well but also provides many unique challenges. Water quality could be substantially increased if more cover crops could be established during the growth of these long season crops because our short season allows for little if any growth after harvest. More conventional machinery such as high clearance sprayers have been adapted to apply seed in between rows. Another philosophy we intend to demonstrate is the "continuous live root". This has the potential to be the most soil friendly rotation as well and the best in water quality. This can be evaluated in the micro watershed portion of our study. Wheat, corn, soybean, alfalfa, peas and cover crops will be the main crops, seeding techniques and machinery will also be focused on.

Appendix C
Conservation Cropping Systems Project-Board of Directors

CCSP Farm:
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701-724-6226
701-799-1180
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Kent Carpenter
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Appendix D
Current Sponsors of the CCSP Project

Platinum
North Dakota Community Foundation
North Dakota Corn Council
Ducks Unlimited
Titan Machinery

Gold
Dakota Plains
Pioneer Hybrids
Richland County SCD
South Dakota Wheat Growers
Wild Rice Soil SCD

Silver
Cropland Seed
James River SCD
Monsanto
Ransom County SCD
K & S Soil Analysis

Bronze
AgCountry, Lisbon
AgVise
Bayer Crop Science
Charnell Haak
Columbia Grain
County 14 Seed
Dairyland Seed Co., Inc

Bronze continued
Dakota Valley Electric
First National Bank - Milnor
Dave and Julie Hassebroek
Dave Bergeman Insurance Agency
Dave Kinzler
Dave Robbins
Day County SCD
Full Circle Ag
James Valley Grain
Marshall Dairy
Meridian Seeds
Millborn Seeds
Northside Implement
Starion Financial
Valent USA

Appendix E
Easement
Wild Rice Soil Conservation District

This Easement ("Easement"), is made by and between Owners Name whose address is Address, City State ("Grantor"), and the Wild Rice Soil Conservation District, a North Dakota political subdivision whose post office address is 8991 Hwy 32, Forman, ND 58032-9702 (the "District"), Grantee.

WHEREAS, the purpose of this Easement is to provide and enhance riparian lands in locations most likely to benefit and sustain water quality. Grantors, in exchange for compensation paid by the District, wish to provide the District with an easement for these purposes. This Easement does not grant any rights to the general public for access to or entry upon the lands described below.

WHEREAS, Chapters 47-05 and 4-22 of the North Dakota Century Code authorize the District to acquire easements on eligible lands to establish conservation practices to enhance water quality.

WHEREAS, the District has developed a water quality program, with the goal of achieving "fully supporting" status for the aquatic life and recreational uses of the Wild Rice River and its tributaries within Sargent County by the means of preventing and reducing water pollutions through the establishment of vegetative riparian buffer zones.

NOW, THEREFORE, for and in consideration of the total sum of $$$$$$$$($$$$.00) the receipt and sufficiency of which the parties acknowledge, Grantors hereby grant, convey, and warrant to the District, its successors and assigns, an easement in accordance with the terms and conditions set forth herein for a term of 00years on the following real property in Sargent County, North Dakota, containing 000.0 acres, more or less, identified as follows, is described:

A buffer of grass measuring approximately 100 to 300 feet on both sides of Property named
The Wild Rice River on SE 00-000-00 and SW 00-000-00

(the "Property"). This Easement is subject to all prior easements, roadways, and mineral rights of record.

Binding Effect. This Easement constitutes servitude upon the Property; this Easement will run with the Property; and this Easement binds Grantors, their heirs, successors, assigns, representatives, and lessees, and including successors in title.

Ownership. Grantors represent and warrant they are the sole owners of the Property in fee simple, including any and all mineral rights; they have good and marketable title to the Property; they have the authority and right to execute this Easement; and this Easement does not violate any mortgage or other interest held by any third party regarding the Property, or any portion of the Property.

Hazardous Substances. Grantors represent and warrant there are no hazardous or toxic substances, pollutants, or contaminants in, on, or under the Property. With the exception of reasonable and necessary application of government-approved fertilizers and pesticides, Grantors will not store or permit spillage, leakage, discharge, or application, of any hazardous or toxic substance, pollutant, contaminant, compost, or manure in, on, or under the Property, and including ground water, surface water, and subsurface soils.

Access to the Property. Grantors warrant the right of not giving access to the public for ingress and egress to the Property across adjacent or other properties of Grantors. Grantors grant the District the right of reasonable ingress and egress to, from, in, on, over, across, and through the Property to inspect the Property and to ensure compliance with the terms of this Easement.

Recreational Uses. Grantors expressly reserve the right to use the Property for reasonable recreational purposes, including, but not limited to, hunting, fishing, hiking, canoeing, and kayaking, as well as access to the Property for those purposes.

Obligations of Grantors. Grantors will comply with all terms and conditions of this Easement, including the following:

1. Grantors, their heirs, successors, assigns or leases, will manage the established native grass cover for purposes of water quality in accordance with the following Best Management Practice agreed to by the District and Grantors.

2. Without otherwise limiting the rights of the District granted in this Easement, the following activities and uses are prohibited on the Property:

   a. Altering of grassland, woodland, wildlife habitat or other natural features by burning, digging, plowing, disking, cutting, or otherwise destroying the vegetative cover except as described in the attached Best Management Practice;

   b. Draining, dredging, channeling, filling, leveling, pumping, diking, impounding, grading, excavating, or related activities, as well as altering or tampering with ground control substances or devices;

   c. Diverting or causing the diversion of surface or underground water into, upon, over, across, though, within, from, or out of the Property by any means;

   d. Planting or harvesting any crops;

   e. Grazing or allowing livestock on the Property except as described in the attached Best Management Practice;

   f. Removing topsoil;

   g. Dumping refuse, waste, sewage, soil, ashes, abandoned vehicles, appliances, machinery, garbage, rubbish, junk, equipment, or other debris; and

   h. Building, constructing, locating, or placing any structures on the Property.

3. Grantors will control noxious weeds and pests on the Property by complying with noxious weed control laws, and will control pests as necessary to protect the public health.

4. Grantors will allow the District, through its authorized agents, access to the Property for purposes of inspection to verify compliance with the terms of this Easement.

5. Grantors will pay when due any and all real property and other taxes and assessments, if any, which may be levied or assessed against the Property.

6. Within 30 days of any sale or conveyance of the Property, or any portion of the Property, Grantors will notify the District, in writing, of the names and addresses of the new owner or owners.

7. Grantors are responsible for all maintenance to improvements on the Property (i.e. fences, gates, pumps, or wells), including any improvements paid for or cost-shared by the District,

8. With regard to all rights reserved by Grantors, including any activities not prohibited by this Easement, Grantors will minimize and prevent any potential damage to water quality. If Grantors believe or reasonably should believe the exercise of a right or any activity not prohibited by this Easement may have an adverse effect on water quality, Grantors will notify the District in writing before exercising the right or activity. If the District determines the exercise of the right or activity will, in fact, result in an adverse effect on water quality, Grantors will not exercise the right or activity without prior written consent of the District.

9. Grantors will not install, or allow any third party to install, any utility facilities, including lines, wires, pipelines, cables, and other associated facilities appurtenances, above or below ground, in, on, under, over, above, though, or across the Property, or any portion of the Property, without prior written consent of the District.

Violations and Remedies. If Grantors fail to comply with any provision of this Easement, the District may, immediately and without the need for any prior notice, enforce the provisions of this Easement in accordance with N.D.C.C. § 47-05-10 and may take any and all other available actions, in law or in equity, to enforce any of Grantors' obligations under this Easement. The remedies provided for in this Easement are cumulative and not exclusive, and are in addition to any and all other remedies available to the District under North Dakota law. Grantors will be responsible for all of the District's costs and expenses, including reasonable attorneys' fees, incurred in enforcing this Easement, or incurred in litigating the terms or validity of this Easement.

Survival of Easement. If any court of competent jurisdiction finds any provision or part of this Easement is invalid, illegal, or unenforceable, that portion will be deemed severed from this Easement, and all remaining terms and provisions of this Easement will remain binding and enforceable.

Entire Agreement. This Easement, together with the attachments to this Easement and together with any subsequent amendments, constitutes the entire agreement between the parties regarding the matters described in this Easement, and this Easement supersedes any previous oral or written agreements between the parties.

Forbearance or Waiver. The failure or delay of the District to insist on the timely performance of any of the terms of this Easement, or the waiver of any particular breach of any of the terms of this Easement, at any time, will not be construed as a continuing waiver of those terms or any subsequent breach, and all terms will continue and remain in full force and effect as if no forbearance or waiver had occurred.

Governing Law. This Agreement will be construed and enforced in accordance with North Dakota law. The parties agree the venue for any litigation arising out of this Agreement will be in State District Court in Sargent County, North Dakota, and the parties waive any objection to personal jurisdiction or venue in Sargent County, North Dakota.

Headings. Headings in this Easement are for convenience only and will not be used to interpret or construe its provisions.

Expiration of Contract. The Wild Rice Soil Conservation District River Program Easement expires the First date of Month, year.

IN WITNESS WHEREOF, Grantors have caused this Easement to be duly executed.

GRANTORS SIGNATURE(S) AND ACKNOWLEDGMENT

_____

Dated this_____ day _____, 20____

_____

Dated this_____ day _____, 20____

STATE OF NORTH DAKOTA)
) ss.
COUNTY OF SARGENT)

On this ____ day of _____, 20__, before me, a Notary Public in and for said County and State, personally appeared _____, known to me to be the person(s) described in and who executed the within and foregoing instrument and acknowledged to me that he/she/they executed the same.

_____
Notary Public, Sargent County, ND
My Commission Expires:

(SEAL)

Appendix F
Milestone Table

Milestone Table for Wild Rice River Restoration and Riparian Project - Phase III

Task/Responsible Organizations	Output	Quantity	Year 1	Year 2
Objective: 1				
Task 1: Employ Watershed Coordinator	1 FTE Employee	1		
Group 3				
Task 2 & 6: LiDAR/ARC GIS Support	Conservation Plan	10	5	5
Group 3				
Task 3: Riaprian	Acres	400	200	200
Groups 1, 2, 3, & 4				
Task 4: Cropland	Acres	1300	650	650
Groups 1, 2, 3, & 4				
Task 5: Grazing Mgmnt.	Systems	4	2	2
Groups 1, 2, 3, & 4				
Task 7 & 8: Education	Outreach Events	19	9	10
Groups 1, 3, & 4				
Task 9: Plots / Crop Rotation	Plots	4	2	2
Group 5				
Task 10: Farm Manager	.1 PTE Farm Manager	1		
Group 5				
Task 11: Land Rent	Plots	4	2	2
Groups 3,5				
Task 12: Workshops/Tours	Outreach Events	10	5	5
Groups 1, 2, 3, 4, & 5				
Task 13 Crop/Pasture Monitoring	Evaluated plots	4	2	2
Groups 1 & 5				

Group 1: NRCS - Provide technical assistance to pland, 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 BMP's
Group 3: Wild Rice SCD - Local project manager and sponsor; including responsibilites for project coordination, payments, match tracking, and progress reports to NDDoH
Group 4: North Dakota Department of Health - Section 319 program management including oversight of planning/expenditures
Group 5: CCS Farm Manager and CCSP Board Members

Wild Rice River Restoration and Riparian Project Phase III - Budget Table			
Part 1: Funding Sources	**2018-2019**	**2019-2020**	**Total Cost**
EPA Section 319 Funds			
1) FY 2018 Funds	$ 105,000.00	$ 105,000.00	$ 210,000.00
State/Local Match			
1) Wild Rice SCD	$ 12,974.80	$ 12,974.80	$ 25,949.60
2) Landowners	$ 18,556.00	$ 18,556.00	$ 37,112.00
3) CCSP	$ 38,469.20	$ 38,469.20	$ 76,938.40
*See Appendix I for Estimated CCSP In-Kind/Match from Sponsors			
Subtotals	$ 70,000.00	$ 70,000.00	$ 140,000.00
Total Budget			
	$ 175,000.00	$ 175,000.00	$ 350,000.00
Other Federal Funds			
1) NRCS (FA)	$ 56,339.75	$ 56,339.75	$ 112,679.50
Total Federal Funds	$ 56,339.75	$ 56,339.75	$ 112,679.50
Total Project Cost			$ 462,679.50

Wild Rice River Restoration and Riparian Project Phase III - Budget Table					
Part 2: Sect 319/Non-Fed	Year 1 Total Cost	Year 2 Total Cost	Total Cost	In-Kind/Match	319 Funds
	7/18-6/19	7/19-6/20			
Personnel/Support					
A. Personnel - 1 FTE	$ 51,000.00	$ 51,000.00	$ 102,000.00	$ 15,309.60	$ 86,690.40
B. Fringe Benefits	$ 10,000.00	$ 10,000.00	$ 20,000.00	$ 4,000.00	$ 16,000.00
C. Travel, Food, Lodging	$ 1,200.00	$ 1,200.00	$ 2,400.00	$ 960.00	$ 1,440.00
D. Supplies	$ 500.00	$ 500.00	$ 1,000.00	$ 400.00	$ 600.00
E. Rent/Utilities	$ 1,200.00	$ 1,200.00	$ 2,400.00	$ 960.00	$ 1,440.00
F. Communications	$ 600.00	$ 600.00	$ 1,200.00	$ 480.00	$ 720.00
G. Equipment	$ 1,500.00	$ 1,500.00	$ 3,000.00	$ 1,200.00	$ 1,800.00
H. Other	$ -	$ -	$ -	$ -	$ -
I. Training	$ 3,000.00	$ 3,000.00	$ 6,000.00	$ 2,400.00	$ 3,600.00
J. Administration Asst.	$ 9,000.00	$ 9,000.00	$ 18,000.00	$ -	$ 18,000.00
Subtotal	**$ 78,000.00**	**$ 78,000.00**	**$ 156,000.00**	**$ 25,709.60**	**$130,290.40**
BMP's : See Appendix G Part 3 of 3 For Examples of BMP's					
Task 1. Personnel (see Above)	$ -	$ -	$ -	$ -	$ -
Task 2. LIDAR/ARC GIS	$ -	$ -	$ -	$ -	$ -
Task 3. Riparian	$ 29,290.00	$ 29,290.00	$ 58,580.00	$ 23,432.00	$ 35,148.00
Task 4. Cropland	$ 8,000.00	$ 8,000.00	$ 16,000.00	$ 6,400.00	$ 9,600.00
Task 5. Grazing/Manure Mgmnt	$ 9,100.00	$ 9,100.00	$ 18,200.00	$ 7,280.00	$ 10,920.00
Subtotal	**$ 46,390.00**	**$ 46,390.00**	**$ 92,780.00**	**$ 37,112.00**	**$ 55,668.00**
Outreach					
Task 6. Meetings	$ 100.00	$ 100.00	$ 200.00	$ 80.00	$ 120.00
Task 7. Public Awareness	$ 100.00	$ 100.00	$ 200.00	$ 80.00	$ 120.00
Task 8. Student Education	$ 100.00	$ 100.00	$ 200.00	$ 80.00	$ 120.00
Subtotal	**$ 300.00**	**$ 300.00**	**$ 600.00**	**$ 240.00**	**$ 360.00**
CCSP Farm: For Task 9 Please Reference Appendix I for Estimated Match/In-Kind					
Task 9: Plots/Crop Rotation	$ 32,669.20	$ 32,669.20	$ 65,338.40	$ 65,338.40	$ -
Task 10: Farm Manager .1 PTE	$ 3,140.80	$ 3,140.80	$ 6,281.60	$ -	$ 6,281.60
Task 11: Land Rent	$ 14,500.00	$ 14,500.00	$ 29,000.00	$ 11,600.00	$ 17,400.00
Task 12: Workshop/Tours	$ -		$ -		
Task 13: Crop Monitoring	$ -		$ -		
Subtotal	**$ 50,310.00**	**$ 50,310.00**	**$ 100,620.00**	**$ 76,938.40**	**$ 23,681.60**
Total 319/Non-Federal Budget	**$ 175,000.00**	**$ 175,000.00**	**$ 350,000.00**	**$140,000.00**	**$210,000.00**
Section 319 Funds per year	$ 105,000.00	$ 105,000.00			
Total local match per year	$ 70,000.00	$ 70,000.00			
SCD match per year	$ 12,974.80	$ 12,974.80			
Producer match per year	$ 18,556.00	$ 18,556.00			
CCSP match per year	$ 38,469.20	$ 38,469.20			

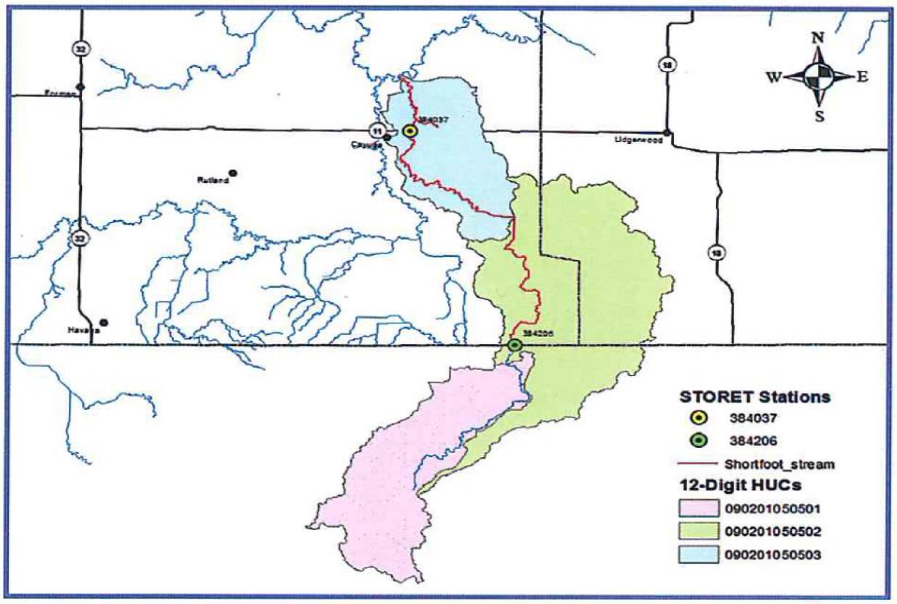
Wild Rice River Restoration and Riparian Project Phase III - BMP's	
Part 3: Projected BMP List	
19	Septic System Renovation
340	Cover Crops
342	Critical Area Planting
351	Well Decommissioning
380	Windbreak/Shelterbelt Establishment
390	Riparian Herbaceous Cover
391	Riaprian Forest Buffer
393	Filter Strip
412	Grassed Waterway
512	Pasture & Hayland Planting
516	Pipeline
550	Range Planting
610	Salinity & Sodic Soil Management
614	Trough and Tank
642	Well

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 is water, 6 percent is 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 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 the 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.

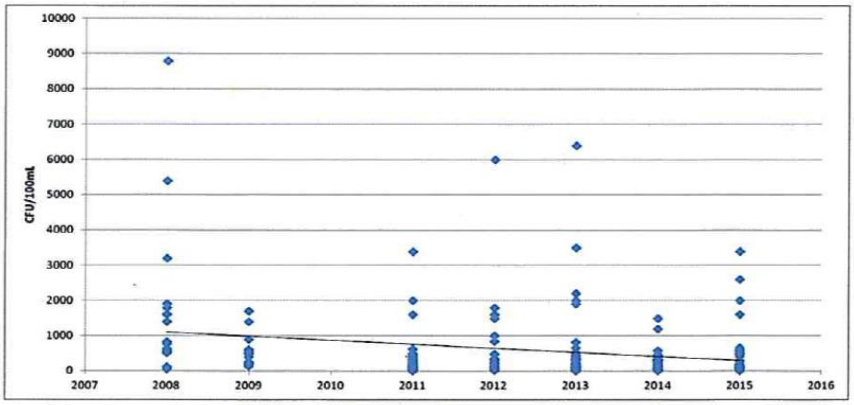
Livestock waste management containment pond and fencing.

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 (59-70 for fair and >70 for good).
3. 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	2,906.34 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	2,020 tons
Well Decommission	3
Riparian Easement	474.80 acres
Riparian Herb Cover	69.7 acres
Pipeline	9,917 feet
Filter Strip	80 acres
Pasture/Hay Planting	60 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 can 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?

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CCSP Farm Summary of In-Kind and Cash Donations (Projected off of Numbers from last year)

Donor / Organization Name	Cash Donation	Match Donation	Match Item
First National Bank	$ 200.00		
Day County SCD	$ 100.00		
ND Corn Utilization Council	$ 14,140.00		
Valent	$ 4,000.00		
James River SCD	$ 2,500.00		
Starion Financial	$ 500.00		
Richland County SCD	$ 5,000.00		
Wild Rice SCD	$ 5,000.00		
Bayer		$ 1,500.00	Fertilizer
SD Wheat Growers		$ 5,000.00	Fertilizer
Pioneer Seed		$ 2,500.00	Chemical
Dakota Plains		$ 1,000.00	Fuel & Chemical
Croplan		$ 2,500.00	Seed
Bear Creek Flying Service		$ 500.00	Fly-On Cover Crop
Titan		$ 13,000.00	Tractor
Full Circle Ag		$ 500.00	Parking/Equipment
Wild Rice SCD		$ 3,600.00	Office Space
Wild Rice SCD		$ 1,000.00	Drill and Bobcat
Totals	$ 31,440.00	$ 31,100.00	$ 62,540.00

Appendix J
CCSP Farm Map