MAPLE RIVER
WATERSHED PROJECT PHASE II
Buffalo Creek

1.0 PROJECT SUMMARY SHEET

LEAD PROJECT SPONSORS/SUBGRANTEES:

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STATE CONTACT PERSON: Greg Sandness **TITLE**: Environmental Scientist

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STATE: North Dakota **WATERSHED:** Maple River

HYDROLOGIC UNIT CODE: 09020205 **HIGH PRIORITY WATERSHED:** No

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
[x] STAFFING & SUPPORT	[ ] GROUNDWATER	[x] AGRICULTURE
[x] WATERSHED RUNOFF	[ ] LAKES/RESERVOIR	[ ] URBAN
[ ] GROUNDWATER	[x] RIVERS	[ ] SILVICULTURE
[x] I & E CONSTRUCTION	[x] STREAMS	[ ]
	[ ] WETLANDS	[ ] RESOURCE
	[ ] OTHER	

EXTRACTION
[ ] STORAGE/LAND DISPOSAL
[ ] HYDRO MODIFICATION
[ ] OTHER

PROJECT: LATITUDE 46 **MIN.** 45 **LONGITUDE** -97 **MIN.** 33

Maple River Watershed Project

GOAL FOR THE PROJECT: During the course of the project period, Cass Soil Conservation District will use promotion and implementation of agricultural Best Management Practices to improve of the designated uses of the Maple River, which includes fish and other aquatic biota, and recreation, while creating measurable reductions in the concentrations of known pollutants (nitrates, phosphorus, and E. Coli bacteria) throughout the Maple River watershed. For Phase II Implementation an emphasis will be put on the Buffalo Creek Watershed to reduce E. Coli bacteria impairments in the Buffalo Creek.

PROJECT DESCRIPTION:

The Maple River Watershed Project will implement comprehensive conservation planning, BMP implementation, monitoring and assessment, and information and education programs on the highest priority ranked sub-watersheds in terms of non-point source pollution (NPS) contribution to the Maple River. The focus for Phase II of the Maple River Watershed project will be to restore the Buffalo Creek Watershed recreational use impairments for E. Coli bacteria to fully supporting.

The main objectives are:

1) Achieve reductions in E. Coli bacterial levels in the Buffalo Creek Watershed through the implementation of BMPs

2) Document long term and short term water quality improvements (i.e. reductions in E. Coli bacteria) in the Buffalo Creek Watershed

3) Increase public awareness on the impacts of and solutions to NPS pollution.

4) Inform and Educate local producers on land management practices to improve soil conditions and water quality.

5) Project administration, management, and support

FY 2014 - 2018 **319 Fund Requested** $ 283,778 **Match** $189,186

Other Federal Funds $2,150,000 **Total Project Cost** $2,622,964

2.0 Statement of Need

2.1 Project Reference

The Cass Co. Soil Conservation District (CCSCD) has long recognized the natural, economic, and recreational value of the many water bodies in the county and will provide financial and technical assistance to develop, coordinate, and implement tasks to reduce the cumulative effects of these NPS pollutants. During Phase I of the Maple River Watershed Project, the CCSCD was able to assist landowners in addressing water quality concerns through the implementation of BMP's. These management practices include: septic system renovations, well decommissioning, field windbreaks, riparian forest buffers, critical area planting, and a variety of cropland BMP's. See **Appendix C** for Phase I BMP implementation numbers.

According to the 2012 Section 303(d) List of Impaired Waters Needing TMDLs (NDDoH, 2012), the North Dakota Department of Health has identified 6 reaches within the watershed as not supporting for fish and other aquatic biota due to fishes bioassessments and dissolved oxygen levels, and fully supporting but threatened for recreation due to Escherichia coli (E. coli) bacteria.

In light of what is known about water quality impairments in the Maple River watershed, the Cass County Soil Conservation District is proposing a Best Management Practice (BMP) Implementation Project to address the water quality concerns evident in the watershed. The result of these BMP will be improvements in the quality of the water in the Maple River and progress toward the removal of this watershed from the North Dakota Section 303(d) list of impaired waters.

To better monitor water quality improvements and focus 319 project funds, Phase II of the Maple River Watershed Project will focus its funding towards BMP implementation in the Buffalo Creek sub watershed.

2.2 Watershed Description

The Maple River watershed is a 1,008,912 acre watershed located in Cass, Barnes, Steele, Ransom, and Richland Counties in southeastern North Dakota (Map 1 Appendix A). The Maple River watershed lies within the Level III Northern Glaciated Plains (46) and Lake Agassiz Plain (48) Ecoregions (Map 3 Appendix A)

The Buffalo Creek, a sub watershed of the Maple River Watershed, will be the primary focus for Phase II implementation. The Buffalo Creek Watershed is 82,000 acres in size and is listed as not supporting for recreational use due to E. Coli bacteria impairment. Buffalo Creek: (Assessment Unit ID: ND-09020205-006-s_00)

2.3 Maps

An Annualized Agricultural NonPoint Source Pollution (AnnAGNPS) model was developed for the Buffalo Creek priority sub watershed. 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 Buffalo Creek watershed. The results of the AnnAGNPS model will be used to target technical and financial assistance for the implementation of BMPs in the watershed. **Appendix A** features Maple River watershed maps, sampling site locations, and AnnAGNPS priority maps, etc.

2.4 General Watershed Information

The Maple River watershed is 1,008,912 acres in size. The topography and elevation within Cass County is predominately flat. The climate is semi-arid with an average of 21"of precipitation annually, with a majority (14.3") falling during the growing season of May through September. The monthly average high temperatures range from a max of 83^0 F in July to a low of 17^0 F in January. Monthly lows range from -3^0 F in January to 57^0 F in July. The annual average temperature is 41^0 F.

The Maple River watershed is divided into two main geologic units. The eastern portion of the watershed encompasses the glacial Lake Agassiz offshore sediments and river sediments, while the extreme western portion of the watershed is glacial till material. The soils of the watershed are strongly influenced by the geology of the region. Most of the area of the watershed is described as level and nearly level fine textured soils that formed on glacial lacustrine sediment and on glacial lake plains. A small area of the western portion of the watershed is level to moderately steep, medium and moderately fine textured soils that formed in glacial till and in alluvium over glacial till (UDSA Soil Survey General Soil Map, 1983). Common soils include the Fargo and Bearden series, which are deep, poorly drained and slowly permeable soils. The natural drainage pattern of these soils is poorly defined. The Barnes series, more common in the western portion of the watershed, is deep, well drained, and moderately slowly permeable.

Primary land use throughout the watershed is intensive row crop agriculture. Corn, beans (soy & dry edible), sunflowers, wheat, and sugarbeets are the primary crops produced. In 2012, 46% of the acres planted in Cass County were soybeans, 35% of the acres were planted to corn, while 9% was planted to wheat. Sugar beets, dry edible beans, sunflowers, and barley each constituted about 1% each of the total acres.

Livestock plays a moderate roll in the agriculture of the watershed, mostly in the west and southwest portions. There are approximately 17,000 head of cattle throughout Cass County, or 1% of all production in North Dakota. Livestock producers in this area are generally small animal feeding operations (AFO) with less than 300 cattle. However, those that do produce livestock are more likely to live near the river or a tributary to the river where the land is less tillable or frequently flooded; therefore it is used as pasture for the animals.

2.5

With intensive agricultural practices dominating the majority of the land use throughout Cass County, agricultural runoff is a major contributor to nonpoint source pollution in the Maple River Watershed. Understanding hydrologic and nutrient data help us identify the extent of nutrient impairments and the threats to recreational uses throughout the watershed.

Hydrology

Hydrology describes the way water flows through a watershed. The water discharge measurement (volume of water) is an important complement to the concentration data collected during water quality analysis, as it allows the determination of what quantity (load) of a pollutant flows through the system over a given time. A concentration value of ten milligrams per liter (mg/L) has a very different effect on the river depending on whether there are three or three thousand liters of water that flow through a system in a day.

Daily stream discharge values were collected at one stream location within the Maple River watershed. This location was at the United States Geological Survey (USGS) gauging station 05060100 (Maple River below Mapleton, ND). The USGS station has operated continuously from 1945 to 1958 and then was reestablished in 1996. USGS gauge station 05060100 is collocated with the NDDoH monitoring location 384155. For the purposes of this report, the last three years (2010-(May) 2013) of historical discharge records will be used to describe the hydrology of the Maple River watershed. **Figure 1** shows the mean annual discharge record from 1945 through 1958 and 1996 to present. It is interesting to note that during the early operation of the gauge station discharge is relatively normal to low, this is most likely due to the weather patterns during those years of normal to below normal precipitation. Likewise, when the gauge station is reestablished in 1996 the flows have increase exponentially, again weather was a driving factor since a “wet cycle” began around this time; also land management is playing a role in these exceptionally high flows. The mean annual discharge for 2010 through 2011 indicated a period of high flows, while 2012 indicated a rather normal to low annual mean flow. The flows present in 2009-2011 are historical large flows since the period of record began for this gauge station, while 2012 flows appear to be more “normal” for this river it is still relatively high for the last period of record (1945-1958).

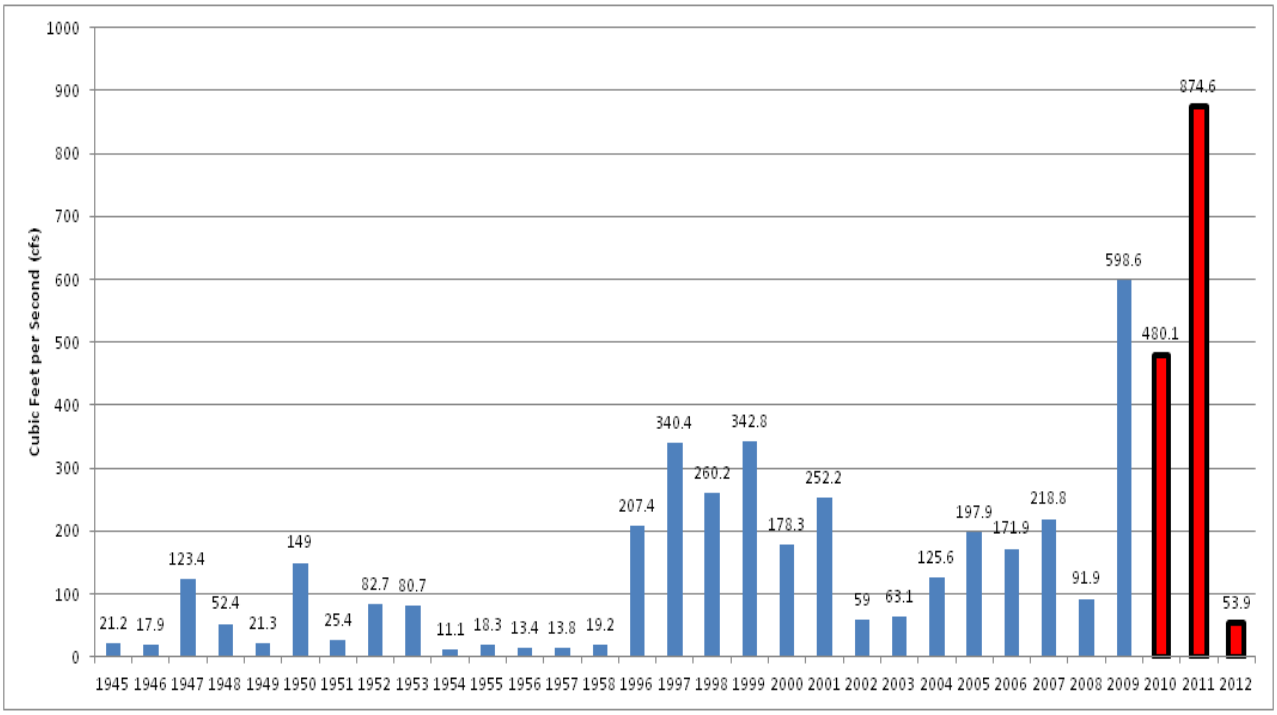


Figure 1. Mean Annual Discharge at the USGS Gauging Station (05060100) on the Maple River below Mapleton, ND (1945-2012).

The following section highlights nutrient data for Nitrogen and Phosphorus at a sampling site located near Mapleton. This section helps point out the extent and the potential causes of nutrient impairments within the watershed.

Total Nitrogen Load Duration Curve Analysis

According to the draft report *An Ecological Assessment of Perennial, Wadeable Streams in the Red River Basin* (Larsen, 2012), Ecoregion 48, Lake Agassiz, had a total nitrogen reference value of 0.883 mg/L. This value was derived from nutrient data collected at a set of "least disturbed" reference sites located in the Lake Agassiz ecoregion of North Dakota. This value is not a water quality standard, as nutrient criteria or standards have not yet been developed, but is provided as a point of reference or goal when evaluating the data collected within the watershed.

Ideally, values that are close to the line indicate a nitrogen load for the stream that is close to the least impacted condition for this ecoregion, and therefore is more healthy. The further away from the criteria line, the larger the negative impact to the stream becomes. As mentioned in the section above, the criteria line is provided for <u>assessment purposes only</u> as statewide nutrient criteria have not been developed for North Dakota at this time.

In Figure 2, the load duration curve for site 384155 indicates that the total nitrogen load is highly related to flow as the symmetry of the samples follow the flow curve quite

closely. This indicates that sources of nitrogen are most likely from overland flow related to nonpoint source pollution runoff. If there were significant point sources of in-stream nutrients, for example a wastewater treatment plant discharge, one would expect to see large increases in loads during low flow events (i.e. 80% - 100% duration intervals on the graph).

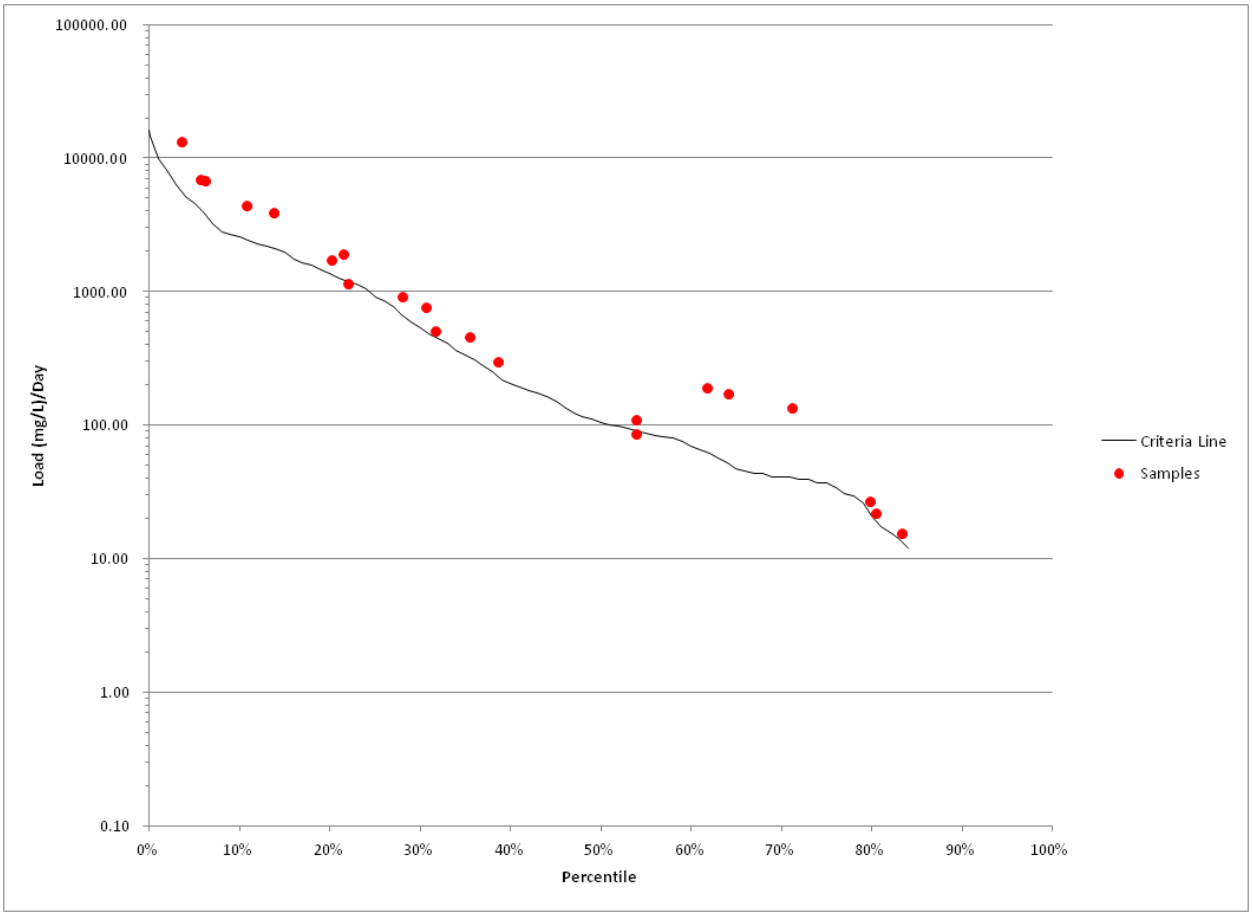


Figure 2. Total Nitrogen Load Duration Curve for the Maple River Monitoring Station 384155 (the curve reflects flow data from 2010-2013).

Total Phosphorus Load Duration Curve Analysis

Based on the draft report *An Ecological Assessment of Perennial, Wadeable Streams in the Red River Basin*, (Larsen, 2012), a total phosphorus reference value of 0.148 mg/L was estimated for the Lake Agassiz Ecoregion (48). This reference value was developed based on data collected at "least disturbed" reference sites located in the Northern Glaciated Plains Ecoregion. Again, a reference value of 0.148 mg/L is not a water quality standard, but is provided as a point of reference when evaluating the data.

In **Figure 3**, the load duration curve for site 384155 indicates that the total phosphorus load is also related to flow conditions. This would also suggest that sources of phosphorus could be overland flow related to nonpoint source pollution runoff.

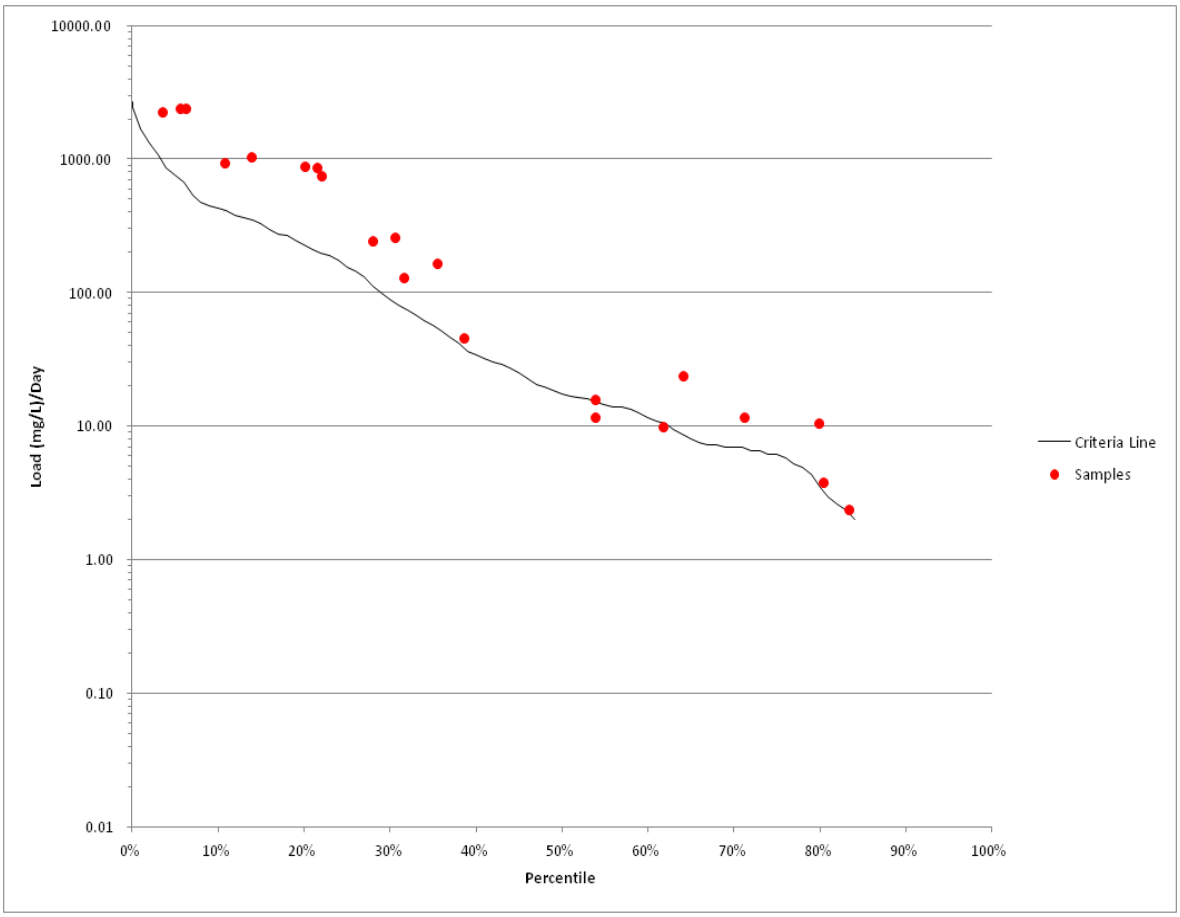


Figure 3. Total Phosphorus Load Duration Curve for the Maple River Monitoring Station 384155 (the curve reflects flow data from 2010-2013).

Generally speaking the load duration curves developed for site 384155 on the Maple River indicate an increase input of total nitrogen and total phosphorus into the river system. Most likely the increased input is a result of nonpoint sources located within the Maple River watershed.

Pathogens

Excessive amounts of fecal bacteria in surface waters used for recreation have been known to indicate an increased risk of pathogen-induced illness to humans. Infections due to pathogen contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat, and skin disease (EPA, 1986). The fecal bacteria known to cause the most harm to humans is E. coli bacteria and is the parameter now used in NDDoH water quality standards.

Recreational Use Support Assessment Methodology

Recreation use is any activity that relies on water for sport and enjoyment. Recreation use includes primary contact activities such as swimming and wading and secondary contact activities such as boating, fishing, and bathing. Recreation use in rivers and streams is considered fully supporting when 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.

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 from May 1 through September 30 does not exceed a density of 126 colony forming units (CFUs) per 100 milliliters (mL). A minimum of five monthly samples are 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: Criteria 1 is met while 2 is not met

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

Sources of Pollution

Typical sources of pollution within the Maple River Watershed can be linked to agricultural runoff. Overland flows contribute significant fertilizer and pesticide runoff causing nutrient impairments. Animal feeding operations and riparian grazing are also a contributor to nutrient impairments and E. Coli bacteria. Land use within the watershed consists of extensively tilled landscapes and expansive cropland acres that leave the land exposed and susceptible to wind and water erosion and contribute to sedimentation in waterways.

Within the Buffalo Creek watershed, failing septic systems and livestock are a contributor to E. Coli bacteria impairments. Funds will be targeted to reduce these inputs through the implementation of BMPs. **Table 1**on *page 10* shows a summary of E. coli data for site 385354 (Buffalo Creek)

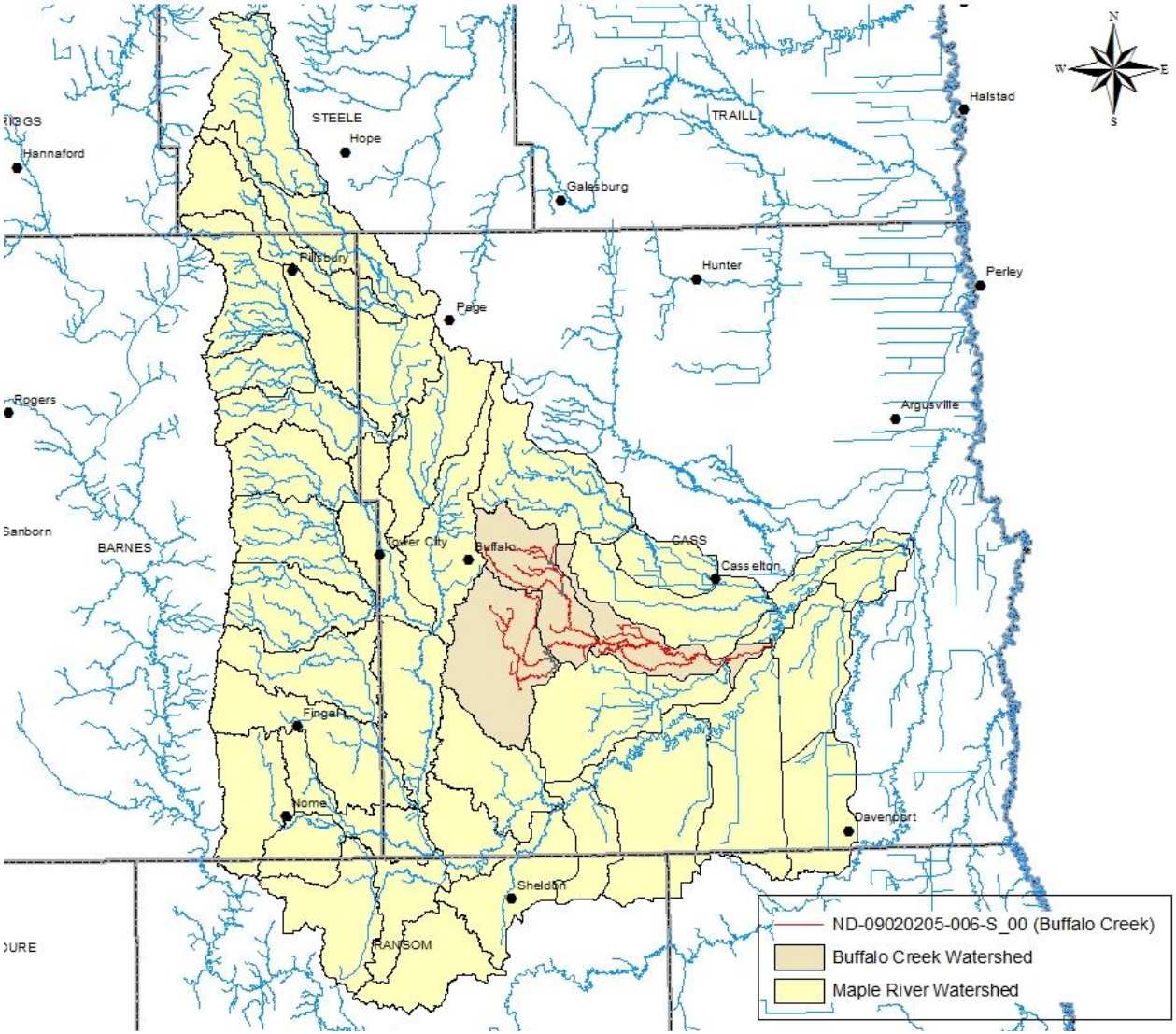


Figure 5. Buffalo Creek priority watershed (ND-09020205-006-S_00)

MAPLE RIVER WATERSHED PROJECT

Table 1. Summary of E. coli Data for site 385354 (Buffalo Creek)

385354										
	May		June		July		August		September	
	5/18/2011	50	6/1/2011	800	7/5/2011	120	8/2/2011	180	9/6/2011	680
	5/25/2011	140	6/7/2011	70	7/13/2011	200	8/9/2011	720	9/13/2011	1100
	5/1/2012	30	6/14/2011	180	7/20/2011	210	8/17/2011	170	9/19/2011	420
	5/8/2012	170	6/20/2011	130	7/26/2011	180	8/23/2011	600	9/27/2011	620
	5/14/2012	140	6/28/2011	140			8/30/2011	3800		
	5/7/2013	10	6/5/2012	40						
	5/7/2013	20	6/20/2012	220						
	5/14/2013	90	6/4/2013	120						
	5/22/2013	40								
	5/29/2013	70								
Geomean		55		145		174		550		664
% Exceeded 409 CFU/100 mL		0%		13%		0%		60%		100%
Recreational Use Support	Fully Supporting		Not Supporting		Not Supporting		Not Supporting		Not Supporting	

Recreational use assessment is not supporting recreational use due to E. coli bacteria impairment

MAPLE RIVER WATERSHED PROJECT

3.0 Project Description

3.1 Goals for the Project: During the course of the project, Cass County Soil Conservation District (SCD) will aim to restore recreational use within the Buffalo Creek Watershed through the implementation of Best Management Practices (BMP) targeted to reduce E. Coli bacteria. As a secondary goal the SCD will use education and promotion of water quality management and BMP implementation to improve land management and water quality in the Maple River Watershed.

3.2 Objectives & Tasks

Objective 1: Provide local project administration and staffing to deliver technical assistance to landowners in the watershed and coordinate with conservation programs available through other state, federal, local and non-governmental organizations.

Task 1: Employ one full-time Watershed Coordinator for 5 years.

Product: Project coordinator to manage day-to-day project activities; provide technical assistance to landowners/producers; organize and conduct I&E events; and coordinate with NRCS Field office staff, Extension Service and other resource management entities to promote and install BMP.

Cost: $187,200 ($112,320 319 funds $74,880 SCD match)

Task 2: Manage Section 319 funds and local match and oversee all aspects of project implementation to ensure all tasks are completed as scheduled.

Product: Monthly review of project activities and progress; annual evaluations of staff performance; ongoing project promotion; assist with outreach efforts; approve BMP cost share agreements; coordinate with project partners; provide support staff; and secure necessary matching funds.

Costs: SCD In-kind match

Objective 2: Reduce E. coli bacteria levels to meet state standards of recreational use impairments in the Buffalo Creek Watershed. State standard criteria for E. coli bacteria during the recreational season are a geometric mean of 126 CFU/100 ml with less than 10% of samples exceeding 409 CFU/100 ml.

Task 3: Identify and repair 15 failed septic systems located within the Buffalo Creek Watershed. Emphasis will be placed on addressing the failed systems located within close proximity to the Buffalo Creek and its tributaries.

Product: Replace or repair 15 failed septic systems contributing to elevated E. coli levels.

Cost: $90,000 ($54,000 319 funds $36,000 producer match)

Task 4: Minimize the length of time livestock are fed in confined areas or riparian areas by assisting producers to implement management systems that utilize fences, water developments, windbreaks, winter grazing management plans, cover crops and/or crop residues to better distribute feeding/grazing locations and move livestock away from riparian areas and confined feeding sites. This task will focus on Buffalo Creek Watershed.

Product: 10 grazing management plans, 2,000 acres of cover crop, 5 miles of field windbreaks, and 1,500 acres of grazing exclusion along impaired riparian zones.

Cost: $85,864 ($51,518 319 funds $39,396 producer match)

Objective 3: Achieve reduction of nutrients (N&P) and sediment loads within the Maple River Watershed through the implementation of BMP. This objective will focus on reducing nutrient runoff through the use of reduced tillage, cover crops, field buffers, and riparian buffers.

Task 5: Improve water infiltration and reduce surface runoff through the use of residue management, reduced tillage, and cover crops.

Product: 1,500 acres of cover crop

Cost: $30,000 ($18,000 319 funds $12,000 producer match)

Task 6: Establish 4 demonstration sites that show cost effective practices that can be used to restore the vegetation within degraded riparian areas.

Product: 4 demonstration sites showing riparian restoration through tree planting, grass seeding; management changes and/or the installation of buffers.

Cost: $9,750 ($5,850 319 funds $3,900 producer match)

Task 7: Coordinate with the FSA and NRCS to enroll CRP acres and establish vegetative buffers along the riparian corridor of the Maple River.

Product: 500 acres of CRP; 50 acres of buffers

Cost: USDA program funding

Objective 4: Monitor the effectiveness of BMP implementation through water quality sampling as BMP are installed.

Task 8: Collect samples, as outlined in the QAPP, to document changes in water quality trends as BMP are installed.

Product: See section 5.0, Evaluation and Monitoring Plan & QAPP.

Cost: $5,000 ($3,000 319 funding & $2,000 local match)

Objective 5: Increase public awareness on the priority NPS pollution issues in Cass County and the feasible solutions to those issues.

Task 9: Design and facilitate no till demonstration site to promote the use of zero tillage, diverse crop rotations, and cover crop. The demonstration site will provide visual evidence to the benefits of using these management practices on the farm. Benefits of using these practices include: reduce wind and water erosion on the landscape, reduce nutrient runoff, improve soil health, diversify monocultures, reduce fertilizer and nutrient inputs.

Product: One no till demonstration site 80 acres in size to demonstrate no till farming, diverse crop rotation, and the use of cover crops

Cost: $ 35,000

*Cost based on $75/acre land rental for the demo site

Task 10: Conduct annual educational events at the no till demonstration site to allow area producers to see and learn about the practices that were used on the site to reduce NPS pollution concerns. When possible, these events will be coordinated with ongoing state and/or federal I/E programs in the area.

Product: 1 Farm tour/year, 5 Educational workshops, and 2 BMP demos.

Cost: $5,000 ($3,000 319 funds $2,000 local match) *sources of in kind match will be used where applicable*

Task 11: Prepare brochures, quarterly newsletter articles, and direct mailings, to local land users and the general public to promote the project and disseminate information on water quality and NPS pollution management.

Product: 5 Quarterly newsletters, one brochure, 2 direct mailings

Cost: $1,250 ($750 319 funds, $500 SCD Match)

3.2 PROJECT MILESTONES:

See Milestone Table, Appendix B.

3.4 PERMITS:

All necessary permits will be acquired. These may include CWA Section 404 permits and NDPDES permits. Project sponsors will work with NDDH to determine if National Pollution Elimination System permits are needed for the proposed livestock systems. The State Historic Preservation Officer will be consulted regarding potential cultural resource affects.

3.5 LEAD PROJECT SPONSOR:

Cass County Soil Conservation District (CCSCD) and the Maple River Water Resource Board (MRWRB) are sponsoring this water quality project with CCSCD as the lead sponsor. The CCSCD's annual and long range plans help to prioritize and guide the field service staff. The CCSCD has legal authorization to employ personnel and receive and expend funds. They have a track record for personnel management and addressing conservation issues for the constituency. The MRWRB is responsible for the management of water resources in the Maple River watershed. They will provide technical support for the project.

3.6 BMP OPERATION AND MAINTENANCE:

Proper operation and maintenance will be assured utilizing the NRCS O&M guidance as listed under the standard and specification for the associated BMP applied or other standard approved by the NDDoH.

4.0 COORDINATION PLAN

4.1 This project sponsors are Cass County Soil Conservation District (CCSCD) and Cass County Water Resource Boards. Major partners include Ransom County SCD, Cass County Commissioners, Natural Resources Conservation Service, ND County Extension Service, and the Lake Agassiz Resource Conservation & Development Council. The CCSCD will be the lead project sponsor.

1. Cass County Soil Conservation District (CCSCD) – The lead project sponsor is the CCSCD. The ND Department Health (NDDoH) will hold a contract with the district. Land use assessment, BMP implementation (demonstration sites), project administration, computer entry, landowner contacts, water sampling, and water quality education will be the responsibility of the district.

2. Ransom County SCD and Barnes County SCD have both expressed support for the project. Ransom County will be providing assistance with livestock waste management system planning in cooperation with their current 319 watershed project in the Sheyenne River watershed.

3. USDA Natural Resources Conservation Service (NRCS) – The NRCS will provide day to day assistance in conservation planning, plan writing, contract writing, and technical assistance for construction and installation of planned BMP. NRCS personnel will conduct quality review and compliance checks of BMP that are designed by NRCS personnel. Local NRCS personnel will provide approved BMP standards and specifications from the NRCS technical guide. Conservation planning assistance will be provided to the Resource Management System (RMS) level. Environment Quality Incentive Program funds will also be available in limited amounts. (NRCS will provide assistance by facilitating local involvement and participating in educational outreach programs during the project period. An annual review will be conducted with ASTC (FO), DC, and the SCD to reconfirm and acknowledge NRCS's ability to commit to the project).

4. North Dakota Department of Health – The NDDoH will oversee 319 funding as well as provide training for proper water quality sample collection, preservation, and transportation to ensure reliable data is obtained. The NDDoH will provide the sponsor oversight to ensure proper management and expenditures of Section 319 funds. They will assist NRCS and the Cass SCD personnel in review of O & M requirements for Section 319 funded BMP.

5. North Dakota State Extension Service (EXT) – To complement the project's information and education activities, local and state Extension personnel may be available to contribute in-kind assistance when needed. This will entail workshops and field tours. The specific role of Extension will be dependent on the type of information/education activity being implemented and availability of staff and materials.

6. Maple River Water Resource Board (WRB) – Maple River Water Resource Board will be involved in the project by acting as advisors. Maple River WRB will contribute Technical assistance for the project and also promote the project in Cass County.

7. North Dakota Game & Fish Department (NDG&F) – Will be asked to provide technical assistance to the project when needed.

8. Farm Services Agency (FSA) – Programs available through FSA will be pursued for cost share assistance.

9. US Fish and Wildlife (USF&W) – Programs and technical assistance available through USF&W will be pursued for project assistance.

4.2 Members of the Cass SCD board, some of whom live in the watershed, express their support for this project, in addition to other government and private entities that have a stake in the watershed. Letters of support are on file at the Cass SCD office from: NRCS, Farm Service Agency, ND G&F, Red River Basin Commission, NDSU Ext., Maple River WRB, Ransom Co. SCD, Lake Agassiz RC&D and US F&W.

4.3 The Maple River Watershed Project will be working closely to coordinate activities with the NRCS, NDG&F Department, and the Maple River Water Resource Board

The Watershed Coordinators for each district will keep communication open between the projects. As a general guideline, projects that are located within Barnes County will be coordinated by the BCSCD Watershed Coordinator.

Several cattle operations in Ransom County have been identified as possible sources for water quality impairments. CCSCD will work with the staff and board member of Ransom County Soil Conservation District (RCSCD) to make this specific funding available to these producers.

4.4 The Maple River Water Resource District is currently drawing up plans for a channel drainage improvement in the Buffalo Creek sub watershed of the Maple River. This project, if approved, could potentially alter the hydrology and ecology of the watershed. Alternative plans are being developed that would address non-point source sediment issues associated with drainage improvement. The Cass SCD, through the 319 watershed coordinator, will remain involved in the process and provide any technical assistance necessary as it relates to addressing non-point source pollution issues associated with the project. There are currently no other similar non-point source pollution projects being undertaken in the watershed. Past and current projects, most of which are associated with USDA programs, which have or do occur, are planned as a part of county-wide efforts to address conservation issues in the area.

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

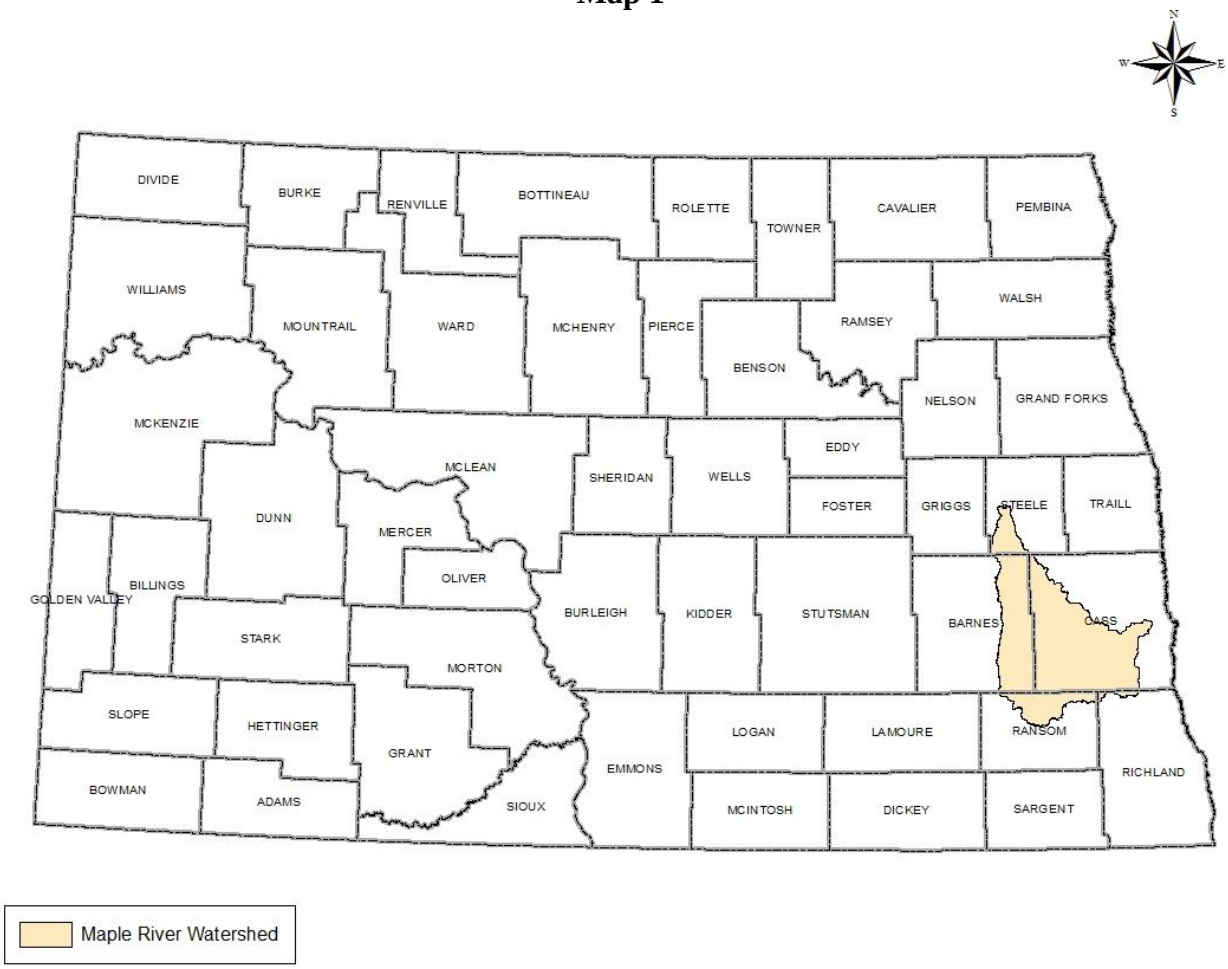
6.1 See Appendix B.

7.0 PUBLIC INVOLVEMENT

7.1 Information and education meetings will be held to keep the community informed. Community leaders, commissioners, water resource board members, and district supervisors will be involved in decision-making processes involving the implementation of the Maple River Watershed Project.

Appendix A
Maps

Map 1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GRAND FORKS
MCKENZIE
MCLEAN
SHERIDAN
WELLS
EDDY
FOSTER
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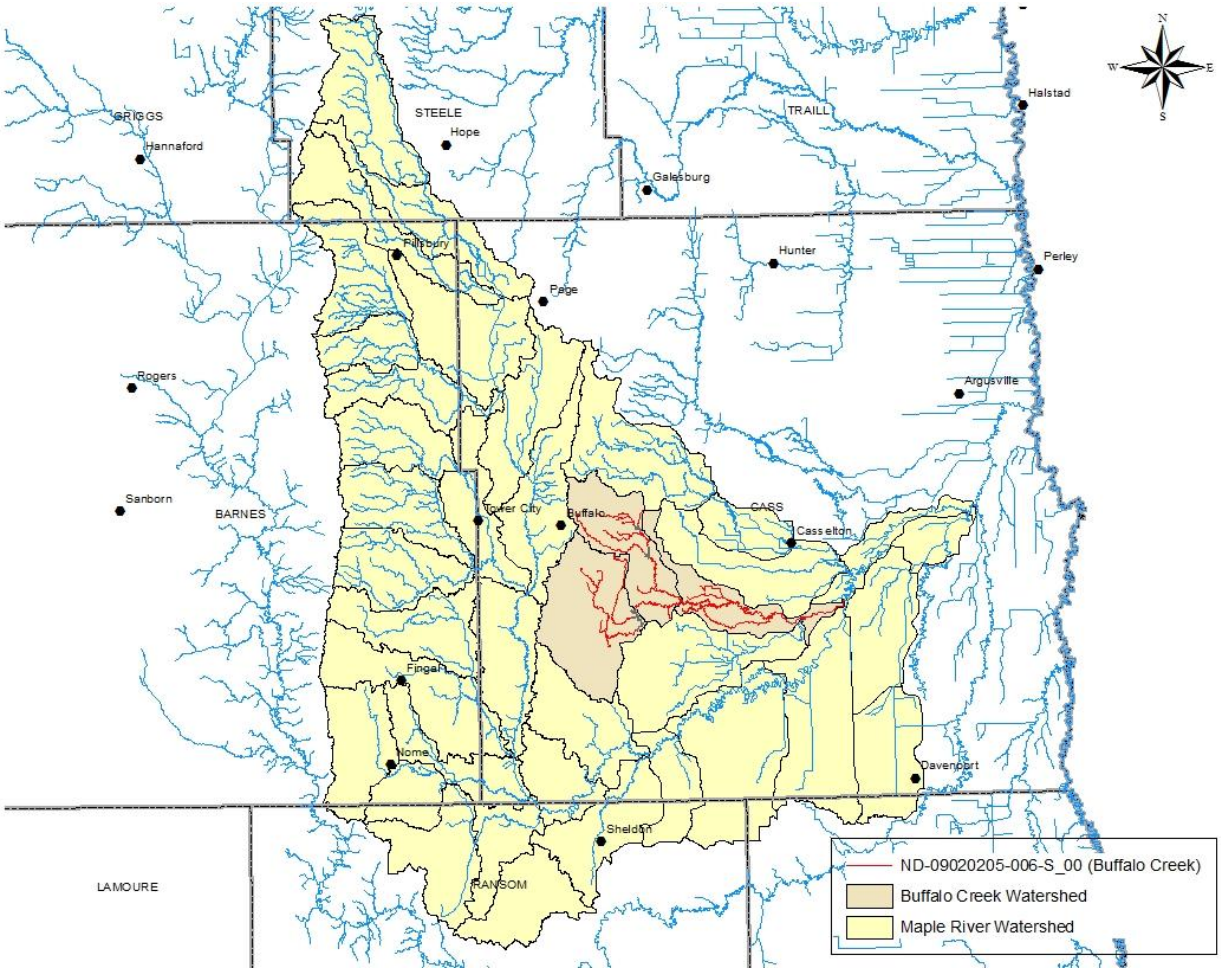
TRAILL
DUNN
MERCER
OLIVER
BILLINGS
GOLDEN VALLEY
STARK
BURLEIGH
KIDDER
STUTSMAN
BARNES
CASS
MORTON
SLOPE
HETTINGER
GRANT
EMMONS
LOGAN
LAMOURE
RANSOM
RICHLAND
BOWMAN
ADAMS
SIOUX
MCINTOSH
DICKEY
SARGENT
Maple River Watershed

Map 2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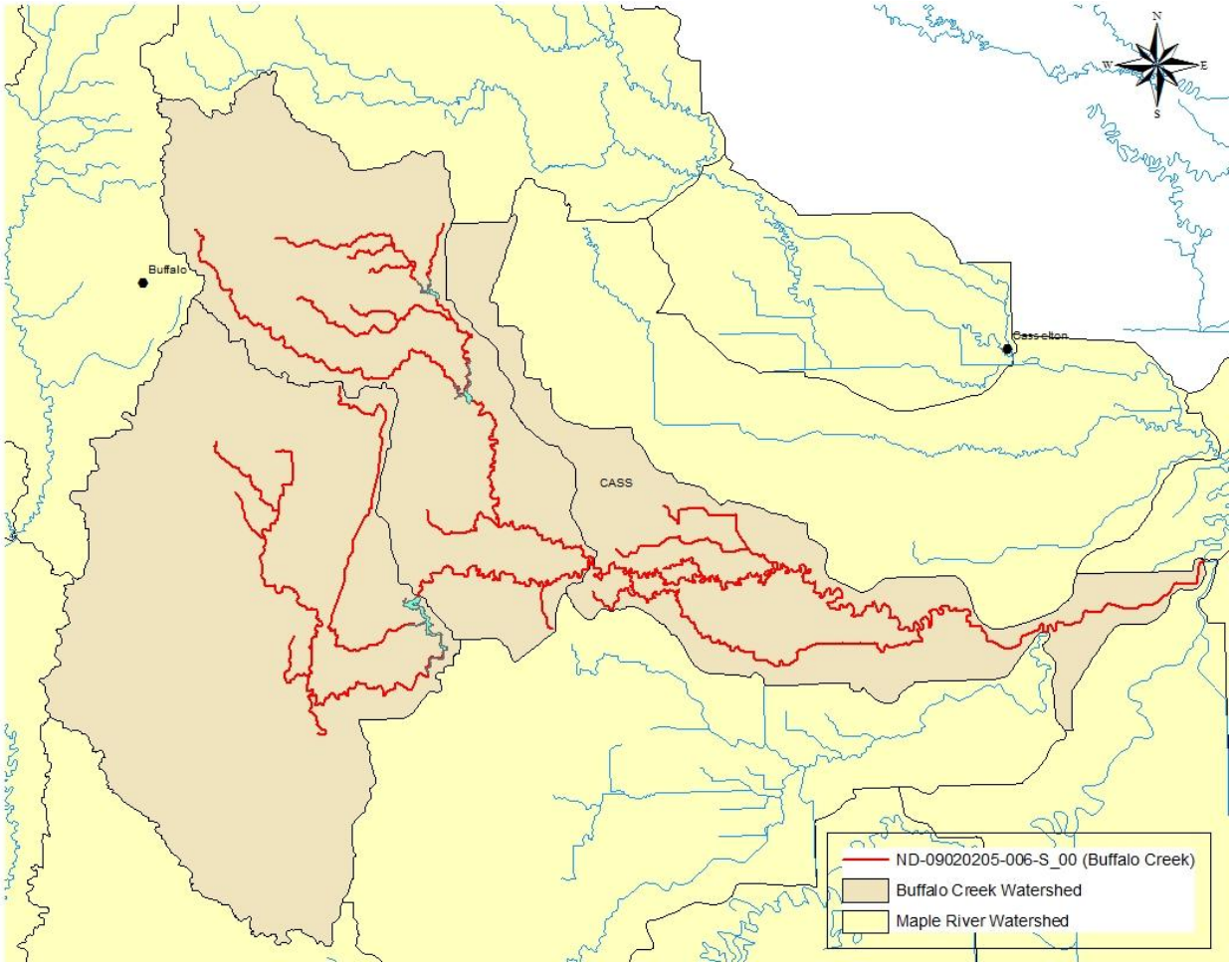
GRIGGS
Hannaford
STEELE
Hope
TRAILL
Galesburg
Halstad
Hunter
Perley
Page
Rogers
Argusville
Sanborn
BARNES
Tower City
Buffalo
CASS
Casselton
Finga
Nome
Davenport
Sheldon
LAMOURE
RANSOM
ND-09020205-006-S_00 (Buffalo Creek)
Buffalo Creek Watershed
Maple River Watershed

Map 3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ND-09020205-006-S_00 (Buffalo Creek)
Buffalo Creek Watershed
Maple River Watershed

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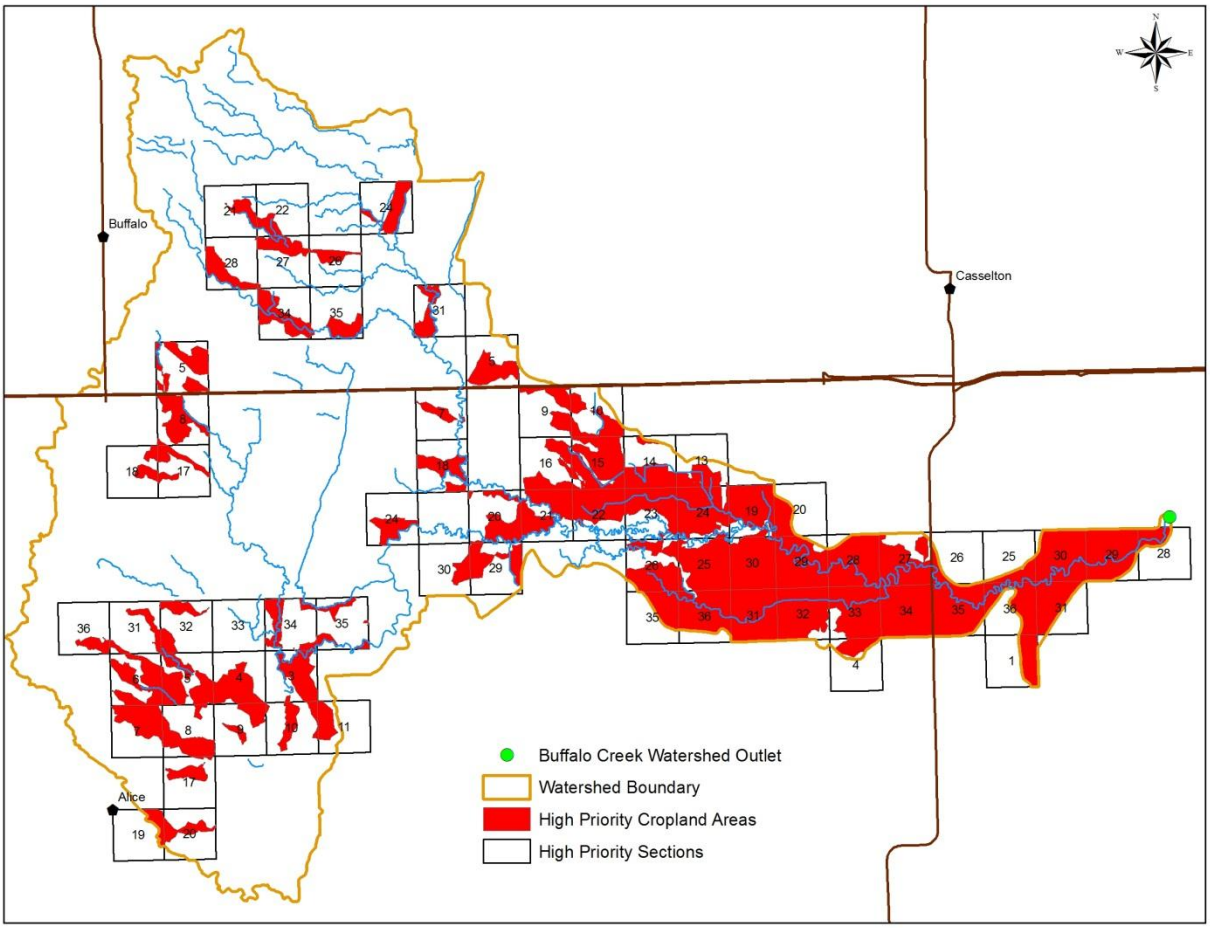
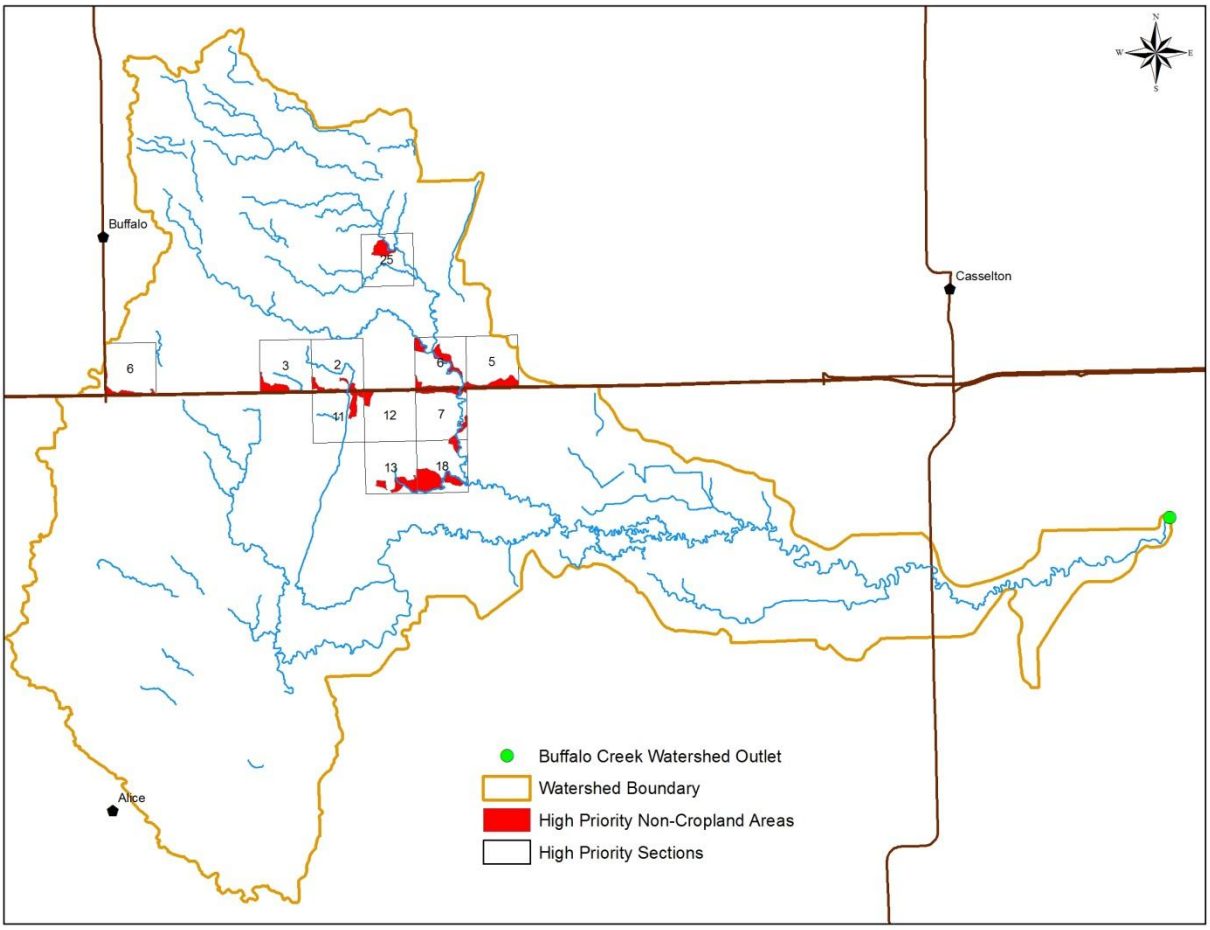

Buffalo
Casselton
Alice
Buffalo Creek Watershed Outlet
Watershed Boundary
High Priority Cropland Areas
High Priority Sections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Buffalo Creek Watershed Outlet
Watershed Boundary
High Priority Non-Cropland Areas
High Priority Sections

Appendix B
Budget

Maple River Watershed Project						
BUDGET TABLE						
PART 1: FUNDING SOURCES	**2014**	**2015**	**2016**	**2017**	**2018**	**TOTAL**
EPA SECTION 319 FUNDS						
1) FY14 Section 319 Funds	$ 56,756	$ 56,756	$ 56,756	$ 56,756	$ 56,756	$ 283,778
Subtotals	***$ 56,756***	***$ 56,756***	***$ 56,756***	***$ 56,756***	***$ 56,756***	***$ 283,778***
OTHER FEDERAL FUNDS *						
1) NRCS (TA)	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 250,000
2) NRCS EQIP & WHIP (FA)	$ 80,000	$ 80,000	$ 80,000	$ 80,000	$ 80,000	$ 400,000
3) NRCS CSP (FA)	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 1,500,000
Subtotals	***$ 430,000***	***$ 430,000***	***$ 430,000***	***$ 430,000***	***$ 430,000***	***$ 2,150,000***
STATE/LOCAL MATCH						
1) Local SCD (TA, FA)	$ 20,588	$ 20,588	$ 20,588	$ 20,588	$ 20,588	$ 102,940
5) Cass County Participating Producers (cash/inkind)	$ 17,249	$ 17,249	$ 17,249	$ 17,249	$ 17,249	$ 86,246
Subtotals	***$ 37,837***	***$ 37,837***	***$ 37,837***	***$ 37,837***	***$ 37,837***	***$ 189,186***
TOTAL BUDGET	**$ 524,593**	**$ 524,593**	**$ 524,593**	**$ 524,593**	**$ 524,593**	**$ 2,622,964**
319 BUDGET	**$ 94,593**	**$ 94,593**	**$ 94,593**	**$ 94,593**	**$ 94,593**	**$ 472,964**

Maple River Watershed Project									
BUDGET TABLE									
PART 2: Section 319 / Non-Federal Budget Funds		2014	2015	2016	2017	2018	TOTAL	In-Kind Match	319 Funds
OBJECTIVE 1: Personnel/Support									
	Task 1								
1)	Salary/Fringe - Watershed Coordinator (full-time: 2080 hrs/yr)	$ 35,360	$ 36,400	$ 37,440	$ 38,480	$ 39,520	**$ 187,200**	**$ 74,880**	**$ 112,320**
2)	Travel (7,000 miles/year at $.56/mile)	$ 3,920	$ 3,920	$ 3,920	$ 3,920	$ 3,920	**$ 19,600**	**$ 7,840**	**$ 11,760**
3)	Training	$ 300	$ 300	$ 300	$ 300	$ 300	**$ 1,500**	**$ 600**	**$ 900**
4)	Cell phone (12/mo @ $30/mo.)	$ 360	$ 360	$ 360	$ 360	$ 360	**$ 1,800**	**$ 720**	**$ 1,080**
5)	SCD Meetings/Inkind (12 mtgs)	$ 1,200	$ 1,200	$ 1,200	$ 1,200	$ 1,200	**$ 6,000**	**$ 2,400**	**$ 3,600**
	Subtotals	***$ 41,140***	***$ 42,180***	***$ 43,220***	***$ 44,260***	***$ 45,300***	***$ 216,100***	***$ 86,440***	***$ 129,660***
OBJECTIVE 2 - 4: BMP's									
	Tasks 3 - 8								
1)	Implement BMP Practices (see attached BMP priority list)	$ 43,123	$ 43,123	$ 43,123	$ 43,123	$ 43,123	**$ 215,614**	**$ 86,246**	**$ 129,368**
	Subtotals	***$ 43,123***	***$ 43,123***	***$ 43,123***	***$ 43,123***	***$ 43,123***	***$ 215,614***	***$ 86,246***	***$ 129,368***
OBJECTIVE 5: Water Quality Monitoring									
1)	Equipment replacement/repair	$ 500	$ 500	$ 500	$ 500	$ 500	**$ 2,500**	**$ 1,000**	**$ 1,500**
2)	Sample Transportation	$ 500	$ 500	$ 500	$ 500	$ 500	**$ 2,500**	**$ 1,000**	**$ 1,500**
	Subtotals	***$ 1,000***	***$ 1,000***	***$ 1,000***	***$ 1,000***	***$ 1,000***	***$ 5,000***	***$ 2,000***	***$ 3,000***
OBJECTIVE 8: Information/Education									
1)	Information/Education Meetings	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	**$ 5,000**	**$ 2,000**	**$ 3,000**
2)	No-till Demonstration site	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	**$ 30,000**	**$ 12,000**	**$ 18,000**
3)	Publications	$ 250	$ 250	$ 250	$ 250	$ 250	**$ 1,250**	**$ 500**	**$ 750**
	Subtotals	***$ 7,250***	***$ 7,250***	***$ 7,250***	***$ 7,250***	***$ 7,250***	***$ 36,250***	***$ 14,500***	***$ 21,750***
TOTAL 319/NON-FEDERAL BUDGET		**$ 92,513**	**$ 93,553**	**$ 94,593**	**$ 95,633**	**$ 96,673**	**$ 472,964**	**$ 189,186**	**$ 283,778**

Maple River Watershed Project

PART 3: Priority Best Management Practices (BMPs)

Objectives	NRCS Code	Practice**	No.*	Acres*	Linear Feet (LF)*	*Rate*	TOTAL	FUNDING: Cost-share Rate	FUNDING: Cash Costs	FUNDING: 319 Match
Objective 2	19	Septic System Rennovation	15			*$ 6,000.00*	$ 90,000	60%	$ 36,000	**$ 54,000**
	472	Use Exclusion		1,500		*$ 15.00*	$ 22,500	60%	$ 9,000	**$ 13,500**
	614	Watering Facility	5			*$ 1,000.00*	$ 5,000	60%	$ 2,000	**$ 3,000**
	516	Pipelines			1,500	*$ 6.00*	$ 9,000	60%	$ 3,600	**$ 5,400**
	382	Fencing			2,500	*$ 1.00*	$ 2,500	60%	$ 1,000	**$ 1,500**
	380	Field Windbreak			26,400	*$ 0.26*	$ 6,864	60%	$ 2,746	**$ 4,118**
	340	Cover Crop		2,000		*$ 20.00*	$ 40,000	60%	$ 16,000	**$ 24,000**
Objective 3	340	Cover Crop		1,500		*$ 20.00*	$ 30,000	60%	$ 12,000	**$ 18,000**
	391	Riparian Forest Buffer		15		*$ 350.00*	$ 5,250	60%	$ 2,100	**$ 3,150**
	390	Riparian Herbaceous Cover		15		*$ 300.00*	$ 4,500	60%	$ 1,800	**$ 2,700**
								60%	$ -	**$ -**
		SUBTOTALS	**20**	**5,030**	**30,400**		**$ 215,614**		**$ 86,246**	**$ 129,368**

MAPLE RIVER WATERSHED PROJECT

Maple River Watershed Project									
I/E Demo Project		**2014**	**2015**	**2016**	**2017**	**2018**	**TOTAL**	Match	319
EPA SECTION 319 FUNDS									
1) No till Demo Plot 160acre	***Demo Site Land Rental	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 30,000	$ 12,000.0	$ 18,000.0
2) Planning	NRCS Contributions, In-kind	$ -					$ -	$ -	$ -
3) Tours	Farm Tours **Task 10*	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 5,000	$ 2,000.0	$ 3,000.0
	Subtotals	***$ 7,000***	***$ 7,000***	***$ 7,000***	***$ 7,000***	***$ 7,000***	***$ 35,000***	***$ 14,000***	***$ 21,000***

*Land rent based on $75/ acre

MAPLE RIVER WATERSHED PROJECT

Maple River Watershed Project								
Milestone Table								
				Year 1	Year 2	Year 3	Year 4	Year 5
	Task/Responsible Organization	Output	Quantity	2014	2015	2016	2017	2017
Objective 1:	Entity 1							
Task 2	Employ Watershed Coordinator		1	x	x	x	x	x
Objective 2:	Entity 1,2,3							
Task 3	Reduce E. Coli Bacteria	Septic System Renovations	15	3	3	3	3	3
Task 4	Livestock BMP	Grazing Management Plans	10	2	2	2	2	2
		Cover Crop	2,000 ac	400 ac	400 ac	400 ac	400 ac	400 ac
		Field Windbreak	5 mi	1mi	1mi	1mi	1mi	1mi
		Grazing Exclusion	1,500 ac	250 ac	250 ac	250 ac	250 ac	250 ac
Objective 3:	Entity 1,2,3							
Task 5	Cover Crop, soil improvement	Cover Crop, residue management	1,500 ac	300 ac	300 ac	300 ac	300 ac	300 ac
Task 6	Riparian Restoration	Forest and Grass Buffers	30ac	6ac	6ac	6ac	6ac	6ac
Task 7	Riparian Restoration	FSA CRP acres	500ac	100ac	100ac	100ac	100ac	100ac
		Buffers	50ac	10ac	10ac	10ac	10ac	10ac
Objective 5:	Entity 1,4							
Task 8	Monitor BMP effectiveness	Water Sampling		See QAPP				
Objective 6:	Entity 1,3,5							
Task 9	No Till Demonstration Site	80 acre Demo Plot		Ongoing throughout project period				
Task 10	SCD and Cooperating Agencies	Field Tours		Farm tour annually, 5 workshops, 2 BMP demos				
Task 11	SCD	Newsletters, Mailings, Brochures		Quarterly newsletter, 2 mailings, 1 brochure				

Entity 1 - Cass County SCD - Local project sponsor, responsible for project coordination, reimbursement payments, match tracking, and progress reporting to the NDDoH. Also provides technical assistance to plan, design and implement BMP.

Entity 2 - Landowners in the Maple River Watershed in Cass County - Make land management decisions and provide cash and in-kind match for BMP.

Entity 3 - Natural Resource Conservation Service - Provides technical assistance to the Cass County SCD for implementation of BMP. Also provides financial assistance for BMP to landowners through the EQIP program.
Entity 4 - North Dakota Department of Health- Statewide section 319 program management including oversight of local 319 planning and expenditures. Also provides technical assistance for water quality analysis and documentation.

Entity 5 – NDSU Extension Service. Assist with planning I/E events. Provide technical assistance and source of in-kind match.

MAPLE RIVER WATERSHED PROJECT

Appendix C

Phase I BMP Implementation

Summary Of Billing Period Expenditures On BMP's

Project: Maple River ***Time Period: 1/1/2010 To 9/25/2013***

NOTE: For multiple year practices where the Planned Amount differs from the Actual Amount Applied, a cumulative Planned Amount value will be used for this Summary Report. However, the Cost Share, Match, etc, are calculated from the Actual Total Yearly Cost input.

Cropland Management

				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	340	**Practice**	Cover Crop	1772.17	Acres	$23,703.32	$15,802.21	$0.00	$39,505.53
Cropland Management Totals:						**$23,703.32**	**$15,802.21**	**$0.00**	**$39,505.53**

Miscellaneous Practices

				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	018	**Practice**	Miscellaneous (Miscellaneous Practices)	2	Misc	$540.00	$360.00	$0.00	$900.00
Code	019	**Practice**	Septic System Renovation	25	Number	$105,214.07	$70,142.71	$0.00	$175,356.78
Code	351	**Practice**	Well Decommissioning	16	Number	$27,055.40	$18,036.94	$0.00	$45,092.34
Miscellaneous Practices Totals:						**$132,809.47**	**$88,539.65**	**$0.00**	**$221,349.12**

Riparian Area Management

				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	580	**Practice**	Streambank and Shoreline Stabilization	250	Linear Feet	$27,656.96	$18,437.97	$0.00	$46,094.93
Riparian Area Management Totals:						**$27,656.96**	**$18,437.97**	**$0.00**	**$46,094.93**

MAPLE RIVER WATERSHED PROJECT

Summary Of Billing Period Expenditures On BMP's

Upland Tree Planting

				Cumulative Amount	Units	Total 319 Cost Share	Total Producer	Total BMP In-Kind	Total BMP Costs
Code	612	**Practice**	Tree/Shrub Establishment	53	Per 100 Ft	$676.20	$450.80	$0.00	$1,127.00
Code	060	**Practice**	Weed Control For Established Trees (Weed Barrier)	49	Per 100 Ft	$1,323.00	$882.00	$0.00	$2,205.00
Code	380	**Practice**	Windbreak/Shelterbelt	26.4	Per 100 Ft	$398.52	$265.68	$0.00	$664.20
Upland Tree Planting Totals:						**$2,397.72**	**$1,598.48**	**$0.00**	**$3,996.20**

Maple River Totals:	**$186,567.47**	**$124,378.31**	**$0.00**	**$310,945.78**

MAPLE RIVER WATERSHED PROJECT