SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

WHITEWATER (CREEK) NORTH WATERSHED IMPLEMENTATION PROJECT

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For

East Pennington Conservation District
Project Sponsor

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This project was conducted in cooperation with the state of South Dakota and the United States Environmental Protection Agency, Region 8.

Grant # C999818599-0

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EXECUTIVE SUMMARY

PROJECT TITLE: WHITEWATER (CREEK) NORTH WATERSHED IMPLEMENTATION PROJECT

SECTION 319 GRANT NUMBER: C999818599-0

PROJECT START DATE: 10 February 2000

PROJECT COMPLETION DATE: 1 January 2001

FUNDING:	TOTAL BUDGET	$64,570.15
	TOTAL EPA GRANT(S)	50,000.00
	OTHER FUNDING	20,000.00
	TOTAL EXPENDITURES OF EPA FUNDS	44,570.15
	TOTAL SECTION 319 MATCH ACCRUED	0.00
	TOTAL EXPENDITURES	64,570.15

The project was a stand alone component of the Bad River National Monitoring Project. Activities completed during the project were designed to install the best management practices (BMPS) needed to evaluate the long term effectiveness of the practices installed in the Bad River Watershed in reducing sediment loads entering the Bad River using a paired watershed experimental design.

The practices were installed at selected sites in the Whitewater Creek North subwatershed which served as the experimental variable; the Whitewater Creek South subwatershed, where BMPS were not installed, the control. BMPs installed included livestock exclusion, managed grazing, drop, check, and grade stabilization structures, channel stabilization, and timber and rock barbs.

The project goal was attained.

INTRODUCTION

The Whitewater Creek North watershed is located in the Bad River National Monitoring Project study area. The study is designed to determine the long term effectiveness of best management practices (BMPs) being implemented to reduce sediment loading of the Bad River.

The goal of the Whitewater Creek North Implementation project was:

> "Install best management practices (BMP's) within the Whitewater Creek North watershed".

Practices were installed at sites identified as major sources of nonpoint source pollution (NPS) in the project area. The practices included sediment traps, drop and check structures, timber and rock barbs, and managed grazing. All were practices identified during previous NPS control activities in the Bad River Watershed as providing the greatest sediment load reductions to the River.

The data relative to sediment loads leaving the Whitewater North Watershed will be gathered by the Bad River National Monitoring Project. The monitoring project will compare the sediment loads entering the Bad River from the Whitewater North Watershed to those entering the river from the Whitewater Creek South Watershed using a paired watershed experimental design. BMPs were not installed in the using a paired watershed experimental design.

The Bad River, located in west-central South Dakota, covers 3,209 square miles of mostly rangeland. The Bad River joins with the Missouri River at Ft. Pierre, South Dakota.

Because of the rolling topography, the fine textured, deep, shale-derived soils of the watershed erode easily when crop and rangeland are not properly managed. Soil erosion, primarily associated with poor grazing management and poorly maintained riparian areas, is hypothesized to be the origin of the silt causing extensive sediment deposition in the main channel of the Missouri River. Loss of channel depth below the Oahe Reservoir located on the Missouri River just above Pierre, SD, has impaired hydropower generation at the Dam, caused flooding in the cities of Pierre and Ft. Pierre, and impacted recreation.

The BMPS were installed under the direction of East Pennington Conservation District, through a partnership with the United States Forest Service, the Natural Resource Conservation Service and local land owners. Management practices were installed. The long term effectiveness of the BMP's in reducing sediment loading will be determined using a paired watershed design.

PROJECT LOCATION

Whitewater Creek North Watershed, which comprises a small portion of the Bad River hydrologic unit, (Figure 1) is located in:

- eastern Pennington County, South Dakota at, Latitude 43 54’ 00” Longitude 102 08’ 30”,
- the upper reaches of the Bad River watershed,
- just north of the Badland National Monument, and is
- part of the Buffalo Gap National Grasslands.

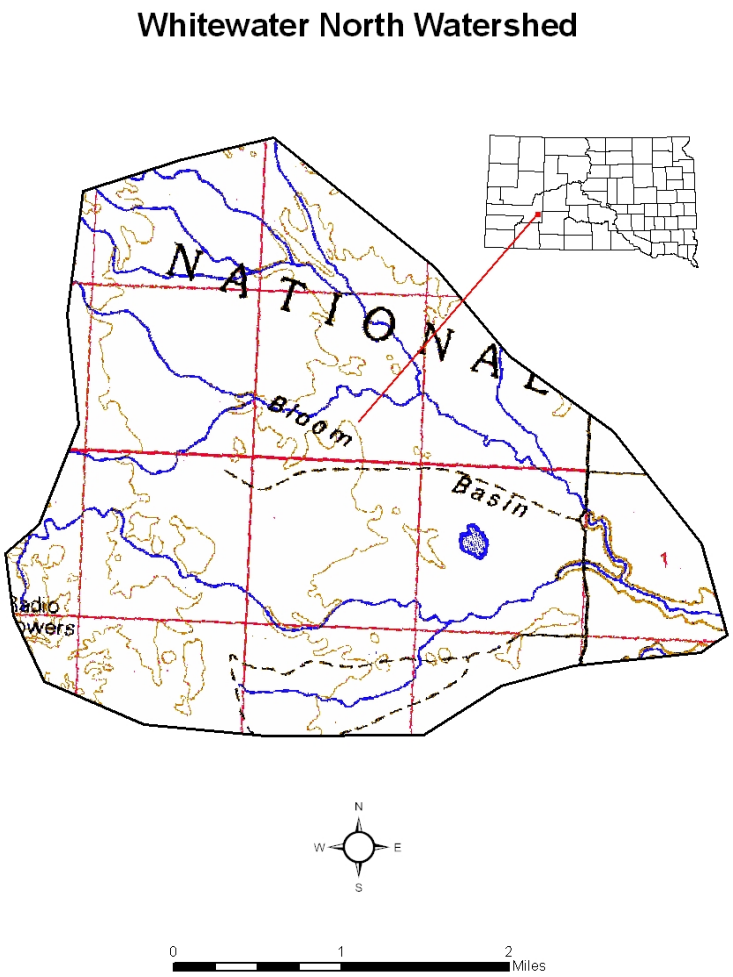

Figure 1. Whitewater Creek North Watershed.

PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

The activities completed to attain the project goal all related to the installation of BMPs considered to have the best potential for reducing erosion and trapping sediment with the least cost (best cost benefit ratio). The BMPS were installed during spring and summer 2000. Installation sites were areas identified as sources of NPS pollution that had a good potential to respond to remedial activities. A description of the sites is included in the discussion of the BMPs installed. A comparison of the planned versus installed BMPs appears in Table 1.

Objective 1: Install Practices within targeted areas:

Task 1:

Install Practices at specific locations in the Whitewater Creek North Watershed considered to have the best potential for reducing erosion and trapping sediment with the least cost (best cost/benefit ratio).

Site # 18: Cost $12,600

Product 1: Structure to control head cutting and protect upstream channels from damage.

Site Description: Head cut located below the confluence of two small drainages. The channels just upstream from this head cut are well vegetated and provide good sediment filters. Install.

Accomplishment: BMP constructed. Existing Dam was raised and extended in length to control head cuts on both drainages. Construction plans listed the site as Site #3

Site #23: Cost $1,716

Product 2: Possible site for grazing, exclusion of a portion of the channel.

Site Description: The channel through this area contains standing water and has good potential for the establishment of woody vegetation and an improved riparian condition. Costs will include ½ mile fence, 4 strands of barb wire.

Accomplishment: BMP constructed. Thirty-one hundred feet of exclusion fence was constructed in the riparian area to exclude livestock and improve vegetation. Construction plans show this as site #7.

Site # 23a: Cost $3,432

Product 3: Exclusion fence constructed in riparian area to exclude livestock and improve vegetation

Accomplishment: BMP constructed. Thirty-one hundred feet of fence were constructed in the riparian area to exclude livestock and improve vegetation. Construction plans show this as site #8.

Site #26 & 27: Cost $11,550

Product 4: Grade stabilization dam which includes sediment storage

Site Description: Sediment dam location with head cut 8-10 feet deep and 15 foot wide drop structure or grade stable dam.

Accomplishment: BMP constructed. A grade stabilization dam which includes sediment storage was constructed and the riparian area below the dam was fenced to exclude livestock. Construction plans include this as site #1.

Site #2 and #3: Cost $600

Product 5: Site #2 - Drop or check structure. Site #3 -Drop or check structure.

Site Description: Site #2 Head cut 3 feet deep and 10 feet wide

Site #3 - Head cut 6 feet deep and 10 feet wide

Accomplishment: BMPs constructed. A diversion was installed to control head cuts at both locations. Construction plans include this as site #6.

Site #6: Cost $5,700

Product 6: Drop or check structure.

Site Description: Head cut 6 feet deep and 10 feet wide

Accomplishment: BMP constructed. A grade stabilization structure was installed to control head cutting. Construction plans include this as site #5

Site #12: Cost $1,415

Product 7: Possible drop structures.

Site Description: Head cut location

Accomplishment: BMP cancelled - Construction at the site was judged not a priority. .

Site #15: Cost $1,415

Product 8: Possible drop structures

Site Description: Head cut location

Accomplishment: BMP constructed. Two wire and post grade stabilization structures with rock backfill were installed to control the two head cuts. Shown on plans as site #4.

Site #24a: Cost $3,500

Product 9: Small check structures.

Site Description: Small rill head cuts

Accomplishment: BMP cancelled – Construction at this site was judged not a priority.

Site #28: Cost $3,400

Product 10: Possible drop structures.

Site Description: Head cut location.

Accomplishment: BMP constructed. A small earth filled grade stabilization structure and 1,622 ft of exclusion fencing in the riparian area below the earth fill was constructed, shown on plans as site #2.

Site #30: Cost $2,500

Product 11: Timber and Rock barbs to control cutting on vertical banks

Site Description: Vertical Banks

Accomplishment: BMP constructed. A new channel was constructed and stabilized with semi-permanent erosion control fabric. The channel was moved away from vertical banks, thereby establishing a floodplain and stabilizing banks. Shown on plans as site #9.

Management: Cost $2,172

Product 12: Maintained/improved range condition in entire watershed.

Accomplishment: Managed grazing BMPs were installed in the watershed.

BEST MANAGEMENT PRACTICES DEVELOPED AND/OR REVISED

The BMPs installed are described in the previous section of this report. All were selected as cost effective practices for reducing sediment loads reaching the Bad River. The effectiveness of the BMPs in reducing sediment loading will be determined through comparison made to the loads originating in the Whitewater Creek South Watershed where BMPs were not installed.

MONITORING AND EVALUATION

Project monitoring and evaluation consisted primarily of documenting project activities and BMPs installation. Water quality sampling was not included in the project work plan. The effectiveness of the BMPs will be evaluated as part of the Bad River National Monitoring Project.

As described previously, the BMPS planned were installed. The project goal was attained.

COORDINATION EFFORTS

The contributions to project success by public and private partners are described below.

East Pennington Conservation District – Local Sponsor. District staff included the project coordinator and business manager who were supervised by District Board of Supervisors. The district coordinated project activities, reported on project activities and progress, vouchered for grant funds, and provided record keeping.

U.S. Forest Service – The United States Forest Service, Buffalo Gap National Grasslands contributed $20,000 for construction of BMPs.

Natural Resources Conservation Service – (Wall Field Office and Rapid City Field Support Office) NRCS provided technical assistance. Field office staff management involved with the project included a soil conservation technician, range conservationists, soil conservationists, soil scientist, and agricultural engineer staff.

SD DENR – Administered the EPA 319 grant funds, served as a consultant for technical information and project planning related to water quality.

PROJECT BUDGET/EXPENDITURES

Table 2 shows the planned project budget versus the amount expended. Eighty-nine percent of the EPA 319 funds budgeted for the project were expended for BMP installation and project management.

Table 1. Planned Versus/Actual Project Expenditures.

	Initial Plan	Final Costs
Total 319	$41,425.60	$44,570.15*
Total US Forest Service	$20,000.00	$20,000.00
Total BMP Projects	$61,425.60	$64,570.15

* Contract change orders added $3,144.55

PUBLIC PARTICIPATION

There was no public participation component in the workplan except installation of the BMPS on land owned or leased by ranchers in the project area.

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL

The project was completed as planned. Only two BMPs included in the workplan were not constructed. Evaluation of the effectiveness of the BMPs installed is a component of the Bad River National Monitoring Project.

FUTURE ACTIVITY RECOMMENDATIONS

None.