

**CEAN WATER ACT SECTION 319
NONPOINT POLLUTION CONTROL PROGRAM**

FINAL REPORT

**LEWIS & CLARK
WATERSHED IMPELEMENTATION PROJECT
SEGMENT 2**

SPONSOR

**RANDALL RESOURCE
CONSERVATION & DEVELOPMENT ASSOCIATION**

Project Coordinator

Rocky Knippling

MARCH 2012

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

Grant: C998185-06, C998185-07, C998185-08 and C998185-09

EXECUTIVE SUMMARY

Project title: Lewis and Clark Watershed Implementation Project - Segment 2

Grants: C998185-06, C998185-07, C998185-08 and C998185-09

Project start date: June 4, 2009

Project completion date: July 31, 2011

Funding:	Total Project Budget		2,975,613.00
	Section 319 Grants	C998185-06	100,000.00
		C998185-07	50,000.00
		C998185-08	47,935.24
		C998185-09	<u>687,064.76</u>
	Total Section 319 Grants		885,000.00
	Section 319 Expenditures		885,000.00
	SD Consolidated Water Fund Grant		130,000.00
	SD Consolidated Water Fund SRF Loan		186,000.00
	USDA NRCS EQIP Funds		578,735.00
	Other Federal		2,822.00
	Local Matching Funds		
		Cash	785,707.71
		In-kind	<u>26,875.43</u>
	Total Expenditures		2,595,140.14

Project goal was:

Restore the beneficial uses of the surface waters in the Lewis and Clark Lake subwatersheds through the installation of best management practices (BMPs) that target sources of sediment, nutrients and fecal coliform bacteria.

The project sponsor was the Randall Resource Conservation and Development Association (RC&D) with support from local, state and federal natural resources management agencies and organizations.

The project goal was based on water quality data collected during watershed and lake assessments initiated during January 2003. Total maximum daily loads (TMDLs) and project implementation plans (PIPs) for waterbodies within the project area were based on the:

- Corsica Lake Watershed study was completed during 2005 with the project to implement the TMDL being initiated during June 2006, and
- study of the remaining east river portion of the Lewis and Clark drainage that was completed during 2006 with the PIP to add the 747,000 acres encompassed by the subwatersheds during 2007.

At the request of producers, the west river portion of the Lewis and Clark and the Lake Andes watersheds became part of the project during 2008. Water quality assessments and TMDLs were completed with best management practice (BMP) implementation initiated as the study and TMDL development was in progress.

The 2007 and 2008 expansions resulted in a project area that encompasses nearly 1.5 million acres and result in the development and implementation of a cluster of TMDLs in the South Dakota portion of hydrologic units (HUs) 10170101, 1015006, 1015001 and 10140101.

TMDL waterbodies included in the project area include: Corsica Lake, Dante Lake, Burke Lake, Choteau Creek, Emanuel Creek, Keya Paha River, Rahn Lake, Roosevelt Lake and Slaughter Creek within the Lewis and Clark Lake Watershed and Lake Andes, Andes Creek, Geddes Lake, Academy Lake, Platte Lake, and Platte Creek in the Lake Francis Case Watershed.

The Section 319 implementation grant award was increased by \$514,800 during 2007 to cover costs associated with the expanded project area. While the 2008 expansion was not accompanied by an increase in Section 319 funding, a second staff person was added to facilitate BMP planning and implementation in the expanded project area and thereby reach the amended milestones established to track TMDL implementation.

BMPs and associated conservation practices selected to implement the TMDLs were primarily associated with reducing nonpoint pollution originating from animal feeding operations and degraded riparian areas. The US Department of Agriculture's (USDA) Conservation Reserve (CRP) and Environmental Quality Incentive (EQIP) Programs were determined to be the most cost effective sources of funds to install many of the practices with Section 319 and state and local funds being used for staff, administration, outreach, monitoring and a secondary source of funds to install the BMPs.

A steering committee was formed during 2007, to facilitate tracking progress toward completion of tasks associated with reaching project objectives and attaining the project goal. Committee member included representatives from 11 conservation districts and other local, state and federal agencies and organizations

Producer meetings, workshops and the print and electronic media were used to promote project awareness and provide information regarding how producers might access BMP design and installation assistance from the project and its partners. Notable among the outreach activities was the holistic grazing school sponsored by the project. As a result of the school, interest in the installation of managed grazing systems increased significantly.

A summary of the BMPs installed during project segments one and two and the load reductions realized from the installation is shown below. The table includes a comparison of the planned versus accomplished milestones as amended and the milestone status relative to that estimated when the first nine years of the implementation strategy was initiated.

BMPs Planned – Installed comparison.

BMP	Milestone						
	Segment 1		Segment 2		Cumulative		% 9 Yr. Milestone
	Planned	Installed	Planned	Installed	Planned	Installed	
Cropland – 42,000 Acres	750	24,502	10,000	14,028	10,750	38,530	91.7
Grassland – 161,000 Acres	1,500	8,859	4,000	7,201	5,500	16,060	9.9
Animal Nutrient Management – 100 systems	8	19	16	12	24	35	35.0

The load reduction summary is shown by cluster of TMDLs in the Lewis and Clark Lake east and west river and Lake Francis Case subwatersheds. The grouping is used for consistency with the project segment 1 report. The reductions are the total of those calculated for the BMPs installed in the TMDL subwatersheds located in the clusters and, therefore, expected to be greater than the delivered reductions to the lakes.

Annual Load Reductions Realized From BMPs Installed.

Watershed	Load Reductions								
	Nitrogen lbs/yr.			Phosphorous lbs/yr.			Sediment Tons/yr.		
	Project Segment			Project Segment			Project Segment		
	1	2	Total	1	2	Total	1	2	Total
Lewis & Clark East River	308,524	195,546	504,070	82,618	51,002	133,620	38,406	20,678	59,084
Lewis & Clark West River	78,041	96,905	174,946	24,117	29,828	53,945	13,266	16,329	29,595
Total Lewis and Clark	386,565	292,451	679,016	106,735	80,830	187,565	51,672	37,007	88,679
Lake Francis Case	1,510	33,153	34,663	474	7,094	7,568	334	60	394
Total Reductions	388,075	325,604	713,679	107,209	87,924	195,133	52,006	37,067	89,073

The practices employed to install the BMPs and load reductions realized by TMDL waterbody are presented in greater detail in the Project Goals, Objectives and Activities, and Monitoring sections of this report respectively.

Based on the data collected during monitoring activities, the project:

- attained the goal established for this project segment and
- is on target to implement the strategy developed to install the BMPs identified as needed to implement the TMDLs in the project area

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INTRODUCTION

The Lewis and Clark Watershed Project was initiated during January 2003 at the request of several local organizations that had expressed concerns relative to sediment loads being deposited in Lewis and Clark Lake. Studies place the estimated amount of sediment load deposited in the lake at approximately 2,600 acre feet each year (= one square mile of mud 4.06 feet deep). The sediment deposited has resulted in the formation of a delta (Figure 1) which is progressing down river from near Springfield, South Dakota toward Gavins Point Dam. At the estimated rate, the sediment loads are expected to significantly reduce the designed 75 – 135 year life span of the reservoir. Figure 2 shows the projected movement of the delta downstream over a 150 year time period if action is not taken.



Figure 1. Lewis and Clark Lake Delta Near Springfield, South Dakota.

The original scope of the project included activities designed to identify sources of sediment entering the impoundment and begin developing remediation strategies to reduce the loading. The South Dakota Department of Environment and Natural Resources (DENR) partnered with the Nebraska Department of Environmental Quality (NEDEQ) to complete the actions. The partners agreed to share water quality data and consider remedial actions that may be indicated.

During the first year of the partnership, it was mutually agreed that the determination of remedial actions could best be accomplished by:

- inventorying and evaluating the animal feeding operations in the watershed,
- completing water quality assessments of the Lewis and Clarke Lake subwatersheds to determine the total nonpoint source (NPS) loads from the subwatersheds,
- develop total maximum daily loads (TMDLs) based on the data and
- then install best management practices (BMPs) to reduce the loads to levels that would support attainment of the designated beneficial uses of waterbodies in the subwatersheds.

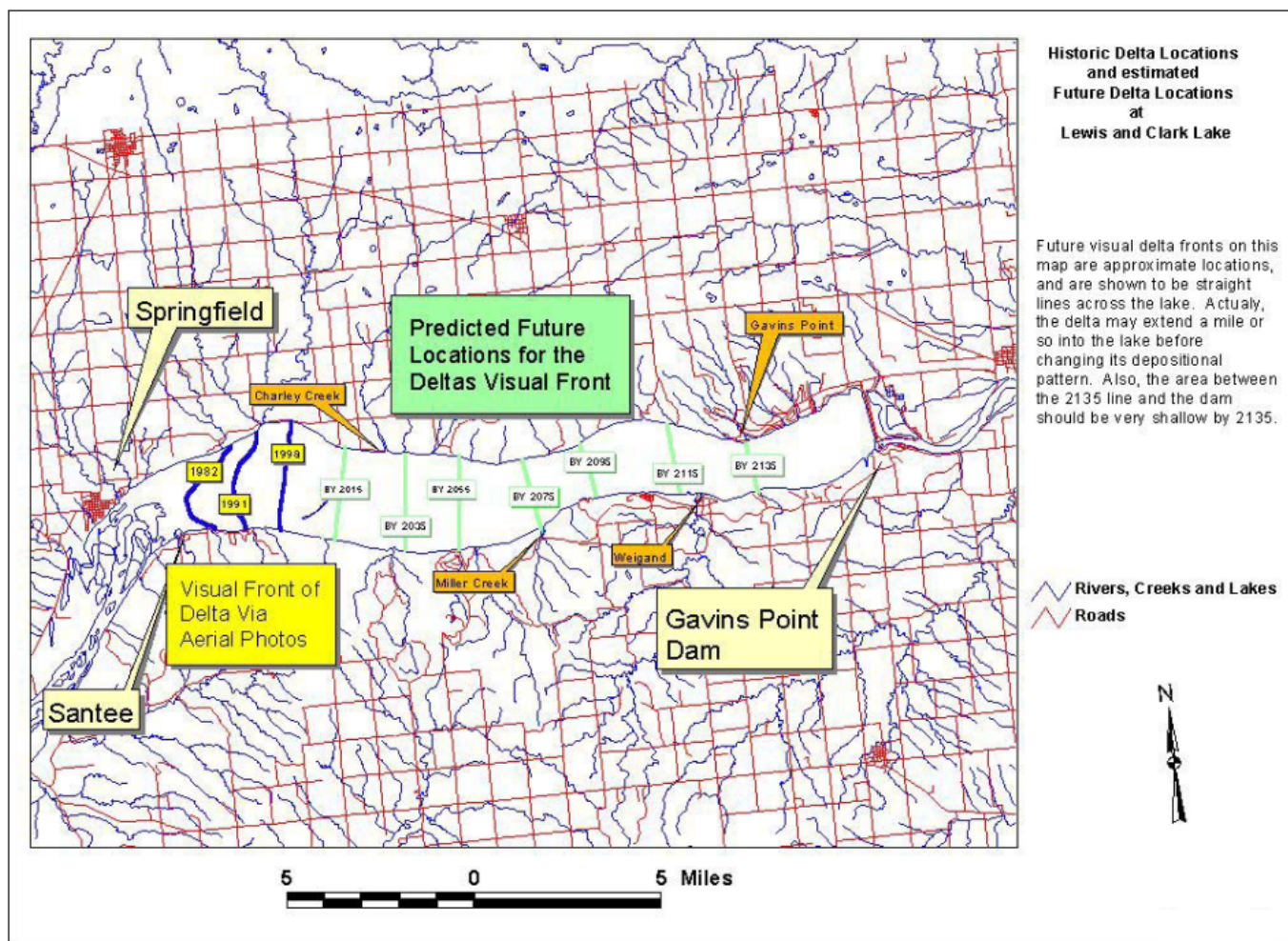


Figure 2. Delta Development at the Current Sediment Deposition Rate.

It was determined that the completion of activities outlined above will require a 10 – 15 year effort. Given the length of time required to complete the activities, the partners agreed that the project could best be completed using a segmented approach with each two to three year project segments building on the water quality data collected during and accomplishments of the previous

Watershed assessments were initiated during 2003 with the approval of the South Central Lakes Project. The South Central Project was designed to identify sources of water quality impairment and develop TMDLs for Corsica Lake, Dante Lake and Lake Andes. Segment 1 of the implementation phase of the Lewis and Clark Watershed Project, was initiated during 2006 to:

- begin implementing the TMDL approved for Corsica Lake during 2005,
- complete the water quality assessments of the waterbodies located in the South Central Lakes Project area and
- develop a strategy to guide the completion of the entire Lewis and Clark Project based on the:
 - Lewis and Clark Initial Watershed Assessment and
 - animal feeding area assessments completed using stakeholder input and the Annualized Agricultural Nonpoint Source Assessment Model (AnnAGNPS) stand alone feedlot model.

The project area was expanded to include the Lake Andes watershed and west river portion of the Lewis and Clark Lake Watershed during 2008. The additions were made in response to requests from project area stakeholders and groups. Principle among those making the request was the Rosebud Cattleman's Association. Association members had concluded that addressing NPS pollution from livestock feeding areas and grazing lands was a key element in successfully providing for the sustained, profitable existence of the livestock industry in south central South Dakota.

More recent additions to the project area include the Geddes Lake, Platte Lake and Academy Lake sub-watersheds which were included in the South Central Lakes Project.

Information follows regarding the;

- waterbodies included in project area as it existed at the end of Project Segment 2,
- status of water quality impairments to the waterbodies,
- TMDLs developed to address the impairments.
- activities completed to begin remediation of the impairments and
- actions necessary to prevent impairments from developing in the future.

Project Area

The Northern Glaciated Plains, Northwestern Great Plains and Nebraska Sandhills ecoregions are represented in the Lewis and Clarke Watershed Implementation Project. Portions of the project area included in the ecoregions are:

Northern Glaciated Plains – Choteau Creek, Emanuel Creek, Snatch Creek, Platte Creek, Corsica Lake, Geddes Lake, Academy Lake and Dante Lake subwatersheds; most of Gregory County bordering the Missouri River and parts of Tripp county to include most of the Ponca Creek and western portion of the Keya Paha River subwatersheds.

Northwestern Great Plains – Western portion of the Keya Paha River subwatershed in Gregory, Tripp and Todd Counties.

Nebraska Sand Hills – Western portion of the Niobrara River Watershed in southern Todd County.

The project area includes the South Dakota portion of four Hydrologic Units (HUs). The HUs with the main waterbody associated with each the HU are listed below. An outline map showing boundaries of the major drainages in the project area is located in Figure 3.

- HU 1015006 - Keya Paha,
- HU 10170101 - Lewis and Clark Lake,
- HU 10150001, Ponca and
- 10140101 - Lake Andes

Lewis and Clark Lake is a man made reservoir which formed along the South Dakota – Nebraska border when a dam across the Missouri River at Gavin's Point was closed during 1957. The dam, located near Yankton in south eastern South Dakota has a:

- 25 mile pool length,
- 45 feet maximum depth,
- 31,400 acre surface area,
- 1,707,741 acre watershed in South Dakota and was
- constructed by the US Army corps of Engineers as part of the Pick-Sloan Project.

Major drainages emptying into the reservoir from the east and west sides of the lake include:

- East
 - Emanuel Creek
 - Choteau Creek
 - Slaughter Creek
 - Platte Creek
 - Andes Creek
- West
 - Niobrara River
 - Ponca Creek

While the Niobrara enters Lewis and Clark Lake on the Nebraska side of the reservoir, the larger portion of the Keya Paha River subwatershed, a major tributary of the Niobrara, is in SD.

Impoundments formed by dams across the tributaries in the drainages referenced above include:

- Choteau Creek - Corsica Lake and Dante Lake,
- Keya Paha River - Rahn Lake,
- Ponca Creek - Roosevelt Lake,
- Platte Creek – Platte Lake and
- Andes Creek – Lake Andes

See Figure 3 (Page 6) for a map showing the location of the waterbodies by subwatershed. The Andes Creek watershed, where in Lake Andes is located, and runoff from the Geddes, Platte and Academy Lakes subwatersheds drain to Lake Francis Case. Lake Francis Case is an impoundment of the Missouri River formed behind the Fort Randall Dam at Pickstown, SD. The dam, which marks the northern most extent of Lewis and Clark Lake and south extent of Lake Francis Case, was completed by the US Army Corps of Engineers during 1954.

Lewis and Clark Lake has a drainage area of approximately 10,000,000 acres, with 1,900,000 acres of the total in South Dakota. Of the total, 750,000 acres are located within the portion of the project area located east of the Missouri River; 1,150,000 acres west of the Missouri River. The Lake Andes Watershed and the combined Geddes, Academy and Platte Lake watersheds added 95,000 and 465,000 acres respectively to the project area bringing the total project area to nearly 2.5 million acres.

Land use in the project area is primarily cropland and grazing. Row crops and hay are the main commodities produced on cultivated lands. Land use transitions from 70 percent cropland east of the Missouri River to 80 percent grasslands used primarily for livestock grazing and small grains west of the river.

Average annual precipitation in the project area varies from 18 inches in the west to 24 inches in the east. Approximately 75 percent of the total is from rainfall during the months of April through September. The remainder is from melt water from the 36 inches of snow that falls on the area each winter. Tornadoes and severe thunderstorms are localized events, of short duration and occasionally produce heavy rainfall events.

Water Quality

Ambient water quality monitoring data and water quality assessments were used to:

- identify NPS sources and loads from the subwatersheds,
- determine beneficial uses of the waterbodies not supported because of the NPS loads,
- support listing in the state's 303 (d) report as impaired waterbodies and
- develop TMDLs to address the impairments.

Approximately 500 animal feeding operations that contribute fecal coliform bacteria to tributaries in the east river portion of the Lewis and Clark Lake Watershed were identified during the assessments. Of the total, more than 100 were determined to be priority operations requiring the construction of animal waste management systems (AWMS) with an accompanying nutrient management plans to reduce the fecal loads. The data also indicated that the high fecal levels were associated with land application of manure, to include both excess application rates and not incorporating manure applied in areas subject to high runoff rates.

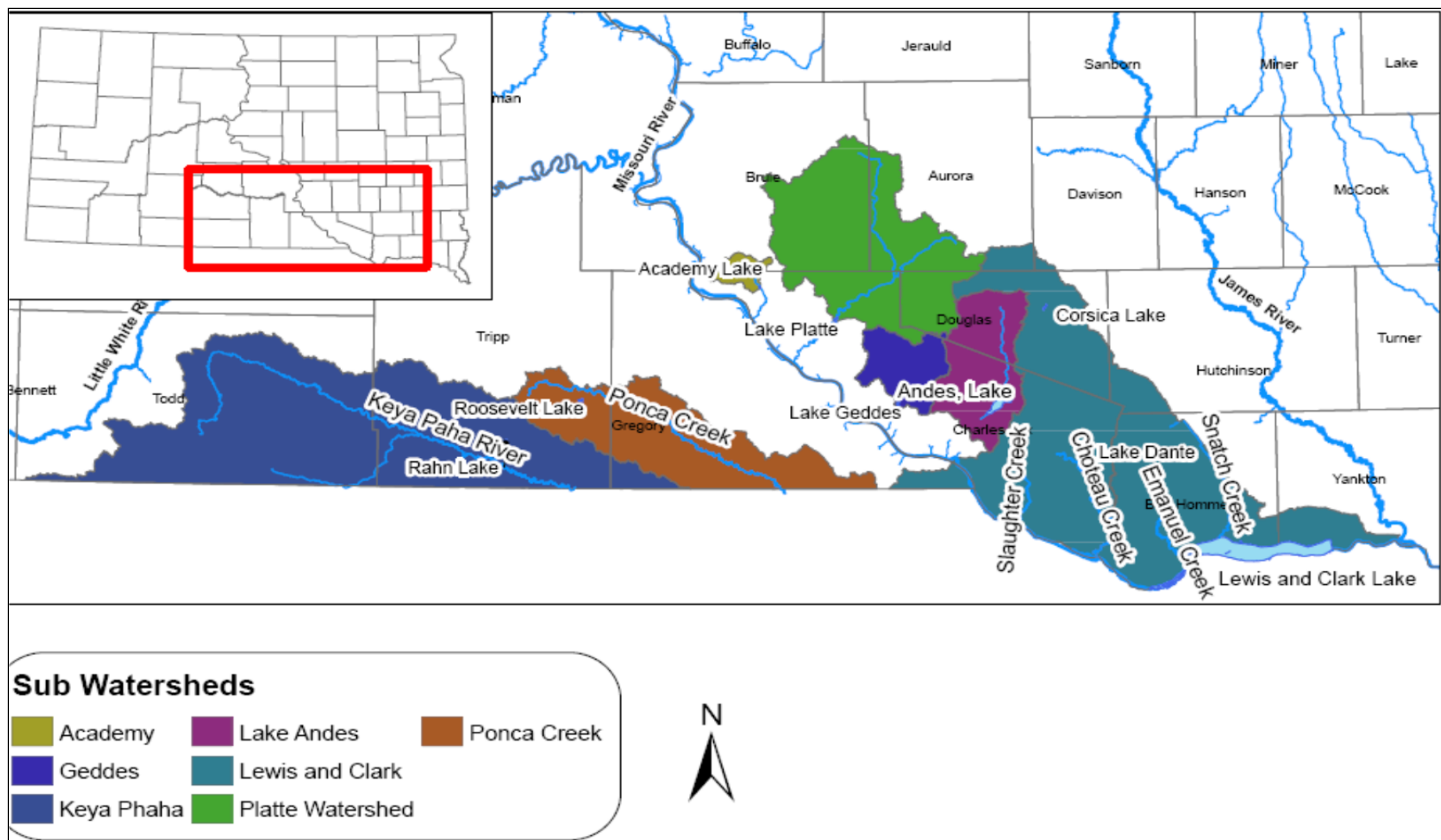


Figure 3. Outline Map Showing Subwatersheds in Project Area.

The animal nutrient management assessment of the west river portion of the project area is in progress. At the end of Segment 2, approximately 100 feeding operations had been identified in Gregory County with the assistance of the Rosebud Cattlemen's Association. The assessment of the remainder of the west area is planned for the next project segment.

Three primary sources of sediment loading identified included:

- sheet and rill erosion of cropland,
- degraded riparian areas and
- channel erosion.

Modeling indicated that reducing sheet and rill erosion is not critical to reducing sediment loading from cropland in much of the western portion of the project area where crop production constitutes a much lower land use than east of the river.

In some areas east of the Missouri River, particularly Bon Homme County, land management practices such as reduced tillage, no till, buffer systems and to a larger extent, managed grazing systems will provide sediment load reduction benefits to the reservoir.

Data gained using the Annualized Agricultural Nonpoint Source (AnnAGNPS) Model and Rapid Geomorphic Assessments (RGAs) identified degraded riparian areas and channel erosion as significant sources for sediment entering the reservoir. Eroded channels appear to be related to management practices, and in some cases, a combination of practices. These include:

- season long grazing, overstocking and grazing along streambanks appear to be associated with much of the degraded channels identified,
- improper sizing and placement of culverts has resulted in channel erosion downstream from where water carried by the culvert empties into the stream and
- degraded ecological range.

A summary of designated use impairments identified using ambient water quality sampling and water quality assessments completed or in progress and TMDL status are shown in Table 1. In addition to beneficial uses not supported, the parameter exceeded is identified and the TMDL(s) and TMDL implementation status are indicated. The beneficial uses are listed by number with:

- 1 - Domestic water supply waters
- 2 - Coldwater permanent fish life propagation waters
- 3 - Coldwater marginal fish life propagation waters
- 4 - Warmwater permanent fish life propagation waters
- 5 - Warmwater semipermanent fish life propagation waters
- 6 - Warmwater marginal fish life propagation waters
- 7 - Immersion recreation waters
- 8 - Limited contact recreation waters
- 9 - Fish and wildlife propagation, recreation, and stock watering waters
- 10 - Irrigation waters; and
- 11 - Commerce and industry waters

A TMDL status of delisted indicates either that additional water quality sampling indicated the parameter to be within established standards or there was a change in listing criteria, i.e. use of trophic state index (TSI) as an indicator of nonsupport.

While delisting may have removed an impaired designation and identification as a priority waterbody which requires development of a TMDL, the data collected during water quality assessments will be used to target BMP installation to areas identified as sources of greater NPS loads. Doing so will:

- contribute to implementation of TMDLs of the entire Lewis and Clarke, Lake Andes and other subwatersheds in the project area that receive runoff from sources identified and
- protect water quality and thereby minimize instances of impairment and subsequent requirement to develop TMDLs in the future.

For a detailed description of the waterbodies, water quality assessment reports, impairment status and TMDLs developed for the waterbodies, access the following web sites.

<http://denr.sd.gov/documents/12irfinal.pdf>

<http://denr.sd.gov/dfta/wp/tmdlpage.aspx>

Project Segment 1 Accomplishments

Project Segment 1 was completed during spring 2009 with the final report submitted during November of that year. Segment 1 accomplishments included:

- formation of a project steering committee with representation from local, state and federal project partners,
- expansion of the project area to include the west river portion of the Lewis and Clark and Lake Andes Watersheds,
- completion of TMDLs for the east river portion of the project area and
- installation of BMPs that reduced NPS pollution originating from approximately 25,500 acres of cropland, and 8,900 acres of grazing lands and 19 animal feeding operations.

The location of the BMPs installed during Segment 1 is shown in Figure 4 (Page 11).

Table 1. Summary of Designated Use Impairment and TMDL Status.

Waterbody	Water Quality Support							
	Impaired Beneficial Use(s) [*]	Parameter(s) Exceeded	TMDL Status	Reductions Needed to Implement TMDL				
				N	P	Sediment	E.Coli	DO (mg/m ₂ /day)
Academy Lake	4	TSI	Delisted	**				
Lake Andes	6,7, 8	DO	Public Noticed		50% = 17.46 T/yr			
		TSI	Delisted					
Antelope Creek	5							
Burke Lake	5	DO, pH	Approved		88% = 24 lb/yr			Aerate to compensate for O ₂
		Phosphorous (TSI)	Approved		Chemical treatment			deficient rate of 510 mg/m ₂ /day
Corsica Lake	6	DO/pH	Delisted					
		TSI	Delisted					
Choteau Creek (Wagner to Mouth)	5	DO	Delisted			Zone 1 89% = 2,910.6 T/day		
		TSS	Approved			Zones 2, 3 & 4 - 0%		
Dante Lake	4	TSI	Approved	64% = 101 lb/yr (tributary) Inlake				
		DO	Delisted	(TP) chemical trt = 30%				
Emmanuel Creek Lewis and Clark Lake to S20,T94N,R6W	5,8	Fecal Coliform Bacteria/E.coli.	Approved			High flow 58% = 803T/day	By flow: High 99%	
		TSS	Approved				Middle 23%	
							Low 0%	
Geddes Lake	5	TSI, DO	Approved	30% = 615 lb/day Chemical trt				Aerate to compensate for O ₂
		pH	Not initiated	during growing season				deficient rate of 72.01 mg/m ₂ /day
Keya Paha River: Keya Paha to Nebraska border	5,8	Fecal Coliform Bacteria	Approved		By flow		By flow	
		E.coli.	Approved		High 86%=968T/day		High 64%	
		TSS	Approved		Moist 65%=32.5T/day		Moist 57%	
					Mid 30%=5.36T/day		Mid 38%	
Lewis and Clark Lake	4,7,8	TSS	Delisted					
		Fecal Coliform Bacteria	Delisted					
Platte Lake	6	TSI	Delisted					
Ponca Creek: Gregory to St. Charles	5,8	Fecal Coliform Bacteria	Approved		By Zone		By flow	
		TSS	Approved		1 – 85%=935.1T/day		High 19%	
					2 – 47%=15.55 T/day		Moist 0%	
					3 – 0%		Moist 0%	
							Mid 11%	
							Dry 0%	
							Low 95%	
Rahn Lake	4	TSI – Chlorophyll - a	Assessment initiated					
Roosevelt Lake	4	Mercury	Assessment initiated					
		TSI	Delisted					
Sand Creek	9,10	Insufficient data						
Slaughter Creek Missouri River to Headwaters	9,10	TDS/Conductivity	Assessment initiated					

** Reduction needed either not applicable (Delisted) or available (assessment not initiated or complete).

Load reductions realized from the BMPs installed are summarized in Table 2. The basis for grouping of Lewis and Clark reductions by east or west of the Missouri River is outlined in the Goal, Objective and Task Section of this report.

Table 2. Segment 1 Load Reductions.

Watershed	NPS Load Reductions		
	Nitrogen lb/yr	Phosphorous lb/yr	Sediment Tons/yr
Corsica Lake	68,970	18,867	3,315
Lewis & Clark East River	212,558	53,631	28,534
Lewis & Clark West River	106,716	34,862	20,157
Total	388,244	107,360	52,006

The Randall Resource Conservation and Development Association (RC&D), the project sponsor, accomplished the tasks included in the project PIP using the services of a project coordinator provided through a contractual agreement with the South Dakota Association of conservation Districts (SDACD).

Both DENR and sponsors of other watershed projects have found that contracting with SDACD for coordinator services has resulted in:

- staff trained in implementing TMDL implementation projects being available during the entire project period and
- project milestones being met, data supporting the accomplishments recorded and the project goal being attained.

The coordinator planned and installed the BMPs through partnerships with local, state and federal agencies and organizations. The partnership facilitated:

- matching practices that best yielded the load reduction results needed to implement the TMDL with each producer's operation and management capabilities,
- targeting cost share funds from project partners to specific practices and activities and
- more efficient use of project and partner resources.

USDA Farm Service Agency (FSA) Conservation Reserve Program (CRP) and Natural Resource Conservation Service (NRCS) Environmental Quality Incentive Program (EQIP) were determined the best source of funds with which to provide farmers and ranchers with cost share funds to install the BMPs. Other major sources of cost share funds included the US Environmental Agency Clean Water Act Section 319 and South Dakota Consolidated Water Construction Fund Grants provided through the SD Department of Environment and Natural Resources (DENR).

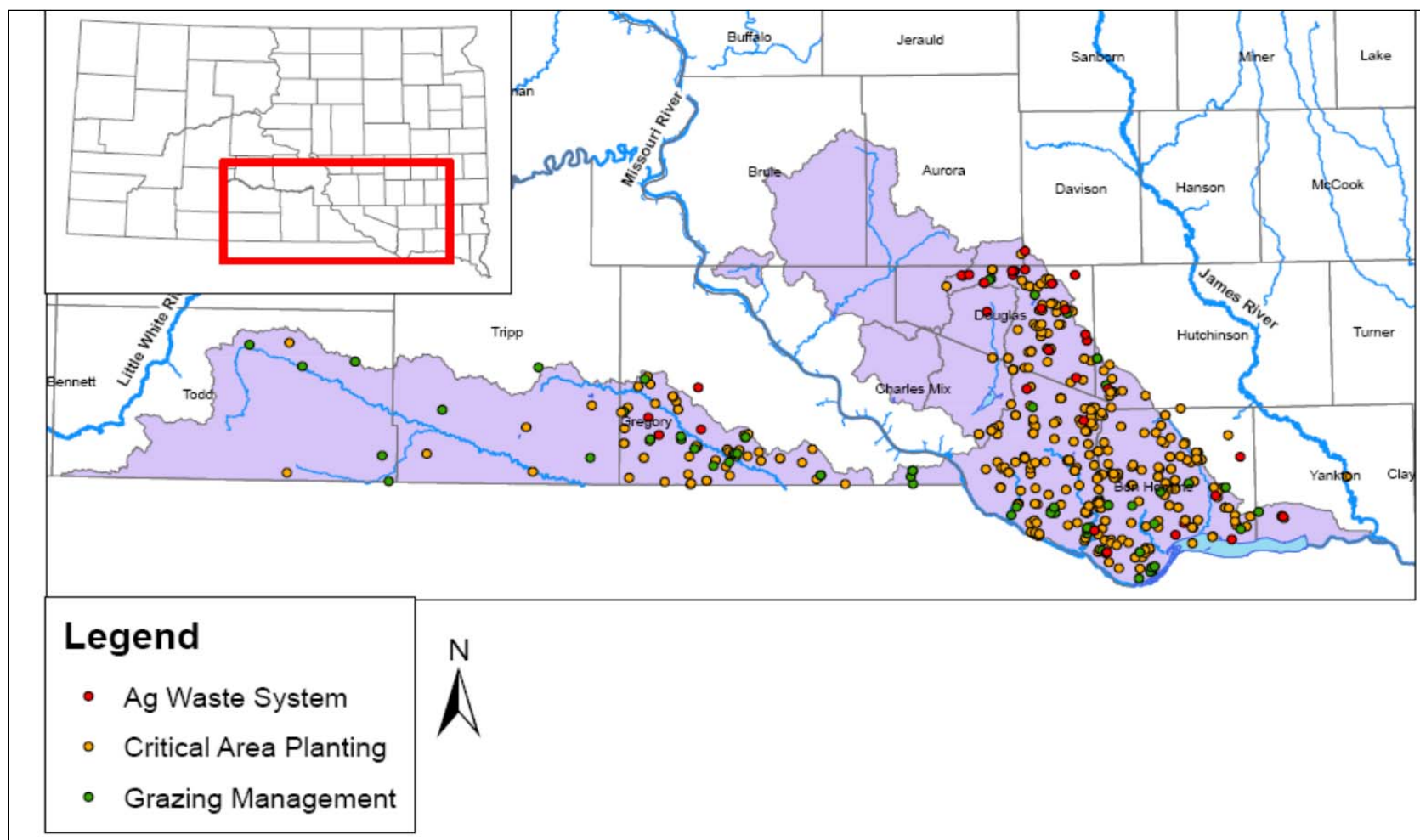


Figure 4. BMPs Installed During Project Segment 1.

Technical assistance for the design and construction of the BMPs was provided by:

- Conservation Districts – BMP planning and information and education,
- SD Discovery Center and Aquarium – Volunteer Water Quality Monitoring Program,
- Rosebud Cattlemen’s Association – Feedlot inventory/assessment in Gregory County,
- NRCS certified private sector technical service providers (TSPs) - Animal Waste Management System (AWMS) design,
- South Dakota Grasslands Coalition (SDGLC) – Grassland BMP design,
- South Dakota Association of Conservation Districts (SDACD) – Project staff and administration
- SD Pheasants Forever – BMP planning,
- South Dakota State University (SDSU) – Information transfer and public outreach activities,
- South Dakota Department of Game Fish and Parks (GFP) – Grassland BMP planning and installation and information and education activities,
- Randall Resource Conservation and Development Association (RC&D) – information and education, administration and coordination,
- USDA Natural Resource Conservation District Conservationists and Ag Waste Management Team – BMP planning and design and
- US Fish and Wildlife Service (FWS) – Grassland BMP planning and installation.

A copy of the Segment 1 final report describing the activities in detail is available by accessing either of the following web sites.

http://denr.sd.gov/dfta/wp/wqprojects/tmdl_lewisandclark319final.pdf
<http://iaspub.epa.gov/pls/grts/f?p=110:3000:696634353236701>

The second web site accesses the EPA Grants Tracking and Reporting System (GRTS) in which the states enter Section 319 project information. The site is available to the public (Guest) as a read only application. When the site “comes up”, click on the “Login as Guest” link to access the GRTS home page. This site may also be accessed directly at:

<http://iaspub.epa.gov/pls/grts/f?p=110:199:0>

Use the tab in the upper left of the page to access projects. Project information is entered by state and year the project grant was awarded. For example, the Lewis and Clark Watershed Implementation Project is located in the South Dakota section; Federal Fiscal Year (FFY) 2009.

A state sponsored program to address nutrient and sediment loads originating from confined animal feeding operations (CAFOs) was in progress during the time period the water quality assessments and implementation activities were being initiated to address NPS loading from the watershed. The DENR–South Dakota Department of Agriculture (SDDA), Ag Manure Management System Engineering and Design Assistance for CAFOs Project, provided financial assistance for the design and construction of AWMSs at permitted animal feeding facilities. SDDA’s Soil and Water Conservation Grants Program (Commission Grant), DENR’s Pollution Prevention Grant from EPA and EQIP provided financial assistance. Technical assistance for

system design was provided by private sector engineers, to include TSPs and the NRCS Animal Nutrient Management Team.

The program resulted in AWMSs being constructed for five CAFOs located in the current project area. Of the total, three were located in the Platte Creek subwatershed; two in the Keya Paha. The load reductions realized from the construction of the CAFOs are not included in this report.

Project Segment 2

Project Segment 2 was initiated during June 2009 to:

- continue BMP implementation in the Lewis and Clark and Lake Andes watersheds with installation targeted towards priority BMPs identified in the watershed assessment and
- conduct a public education and outreach campaign to inform landowners, stakeholders and area residents of the water quality issues and opportunities for participation in the project.

The Segment 2 practices planned when the Segment 1 PIP was developed are summarized in Table 3. The practices listed in the table are those estimated as needed to reduce NPS loads during the first nine of the projected 10 to 15 year TMDL implementation strategy.

Information presented previously (Executive Summary) and that will be presented in subsequent sections of this report, indicate that project segment 1 BMP milestones were exceeded and that Segment 2 BMP installation also exceeded benchmarks established during initial project planning activities.

Table 3. Estimated Nine Year Best Management Practice Milestones.

Best Management Practices Identified During the Watershed Assessments.	Acres/Practice to Attain the Project Goal	Acres/Practices Planned Segment 1 (2 years)	Acres/Practices Planned Segment 2 (4 years)	Acres/Practices Planned Segment 3 (4 -9 years)
Best Management Practices				
Cropland BMPs	40,000	750	10,500	28,750
Filters/Buffer Strips/Grassed Waterways/Tree Planting	2000	95	500	1,405
Grassland BMPs				
Planned Grazing Systems	140,000	1,500	30,000s	108,500
Grass Seeding	20,000	350	5,750	13,900
Riparian Buffers	1,200	15	500	6,850
Animal Feeding Operations				
Animal Waste Systems	100	8	15	77

The tasks completed during Project Segment 2 to install BMPs that reduce NPS pollution from the watershed are described in the Project Goals, Objectives and Activities report section that follows.

PROJECT GOAL, OBJECTIVES AND ACCOMPLISHMENTS BY TASK

The project goal was:

Restore the beneficial uses of the surface waters in the Lewis and Clark Lake subwatersheds through the installation of best management practices (BMPs) that target sources of sediment, nutrients and fecal coliform bacteria.

Three objectives were established to facilitate attaining the goal:

1. Objective 1: Reduce nutrient, sediment and fecal coliform loadings from the Lewis and Clark and Lake Andes Watersheds through the installation of BMPs.
2. Objective 2: Provide project and BMP information to a minimum of 100 watershed landowners, 20 watershed organizations, and 2,500 area citizens to inform them of this project's need and progress in addition to the results and recommendations from the Phase I Watershed Assessment.
3. Objective 3: Complete water quality monitoring, monitor project progress and complete project administration and management to document project progress toward reaching project objectives and meet grant administration policies and guidelines.

Activities identified for each of the tasks were completed by partnership of local, state and federal agencies and organizations. The activities included:

- BMP selection, design and installation;
- development and implementation of an information transfer campaign and
- completion of water quality monitoring and BMP installation progress toward accomplishing project milestones.

Implementation of the PIP was completed through partnerships with local, state and federal agencies organizations. Coordination of the partner's efforts was continued by project staff (coordinator) provided by SDACD through the contractual agreement entered during previous project segment. Mid-way through the project period, SDACD provided a second staff person. The additional staff was necessary to provide BMP planning and implementation assistance to the producers located in the west river portion of the project area.

The sources of funds accessed for financial assistance included:

- SDDA - SD Soil and Water Conservation Grant awarded through the SD Conservation Commission,
- GFP - State Acres for Wildlife Enhancement (SAFE),
- DENR – Consolidated Water Facilities Construction Fund Program,
- USDA NRCS – Environmental Quality Incentive (EQIP) and Wildlife Habitat Incentive (WHIP) and Farm Bill Implementation Technical Assistance Programs,

- USDA FSA – Conservation Reserve and Continuous Conservation Reserve Programs (CRP and CCRP),
- USFWS – Annual appropriation for SD habitat projects and
- EPA - Clean Water Act Section 319 Implementation Project Grant and 303(d) Watershed Planning and Assistance Grant awarded to SDACD through DENR.

Technical assistance for the design and installation of the BMPs and the completion of other project tasks was accomplished through partnerships with several agencies and organizations. Among these were:

- Local conservation districts – Grassland and cropland BMPs and O & M compliance,
- NRCS certified TSPs - Animal Waste Management System (AWMS) design, Crop and Grassland BMP design and installation
- SDGLC – Grassland BMPs
- SD Pheasants Forever – Grassland BMPs
- SDACD 303(d) project employees – BMP planning
- South Dakota Department of Game Fish and Parks (GFP) – Grassland BMPs
- USDA NRCS District Conservationists and Ag Waste Management Team – Grassland, cropland and riparian BMP planning and installation oversight and AWMS design and
- US FWS – Grassland BMP planning.

Additional project partnerships providing resources that supported the successful design and installation of the BMPs are discussed in the Coordination Section of this report. Contributions made by these project partners were essential to reaching and exceeding project milestones, and included activities such as gaining producer trust and participation, information transfer and project administration.

During project segments 1 and 2, a combined total of 855 of the conservation practices listed in Table 4(Page 16) have been used to install BMPs in the ten country project area. For a description of the practices, refer to USDA FSA standards for Conservation Practices or the USDA NRCS electronic Field Office Technical Guide (efotg). The NRCS guide is available by accessing:

[Field Office Technical Guide \(FOTG\) | NRCS.](#)

Areas targeted for cropland and grassland BMP installation were identified and prioritized using AnnAGNPS data provided by the watershed assessments. Animal feeding operations were prioritized using data from the AnnAGNPS stand alone feedlot model and other factors such as proximity to a stream or stream segment. Feeding operations identified as priorities for AWMS construction in the project area east of the Missouri River typically had scores between 75 and 100 with 100 the highest score on the rating scale.

The location of each BMP installed was mapped (Figures 4, 5 and 6 – Pages 11, 17 and 18) using data entered into the DENR Project Management System (Tracker) and NRCS Program Contacts system (PROTRACTS).

Table 4. Practices Used to Install BMPs.

Best Management Practice	Practices	NRCS Practice Code
Grassland Management	Riparian Buffers (Marginal Pasture and Riparian Continuous Conservation Reserve Program)	342 Critical Area Planting 380 Windbreak/Shelterbelt Establishment 472 Access Control 595 Pest Management
	Windbreaks (Fabricated and Earth Constructed)	561 Heavy Use Protection
	Grazing systems Fence Pipeline Water Tanks Pond/Dugout Cleanout	528 Prescribed Grazing 382 Fence 516 Pipeline 614 Watering Facility 378 Pond
	Wetland Restoration	657 Wetland Restoration
Cropland Management	Grass Seeding (CRP)	327 Conservation Cover 342 Critical Area Planting
	Buffer Strips and Grassed Waterways (CCRP and RAM rentals)	412 Grassed Waterway 393 Filter Strip
	Tree Planting	380 Tree Planting
Livestock Nutrient Management	Animal Waste Management system Nutrient Management Plan	312 Waste Storage Facility Construction 590 Nutrient Management

Load reductions realized from the BMPs installed were determined using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) developed by EPA Region 5. The load reductions achieved during each project year were provided to DENR in partial fulfillment of reporting requirements. The data was included in the annual reports prepared using the format provided by DENR to facilitate entry into EPA's Grants Reporting and Tracking System (GRTS).

Landowners and operators provided BMP design and installation assistance were required to enter an agreement that outlined the responsibilities of the cooperator and project sponsor. The agreement included an operation and maintenance (O&M) clause which specified the operation and maintenance requirements, procedures for BMP failure or abandonment, time period (life span) for which the BMP must be maintained and the other responsibilities of the parties to the agreement.

Compliance with O & M requirements was completed by the conservation districts. Funds to defray the costs incurred by the districts were provided by NRCS and SDACD's technical assistance grant from the agency.

Compliance with cultural resource and threatened and endangered species requirements was completed. Section 401 and 404 stormwater construction permits were obtained prior to installing practices.

Milestones for the BMPs associated with each project task are as amended. A cumulative summary of BMPs installed during Project Segments 1 and 2 is located in Table 5. The reader is directed to the Monitoring and Evaluation section of this report for a summary of milestone achievement for the project to date and a comparison of how the accomplished levels relate to that required for full TMDL implementation.

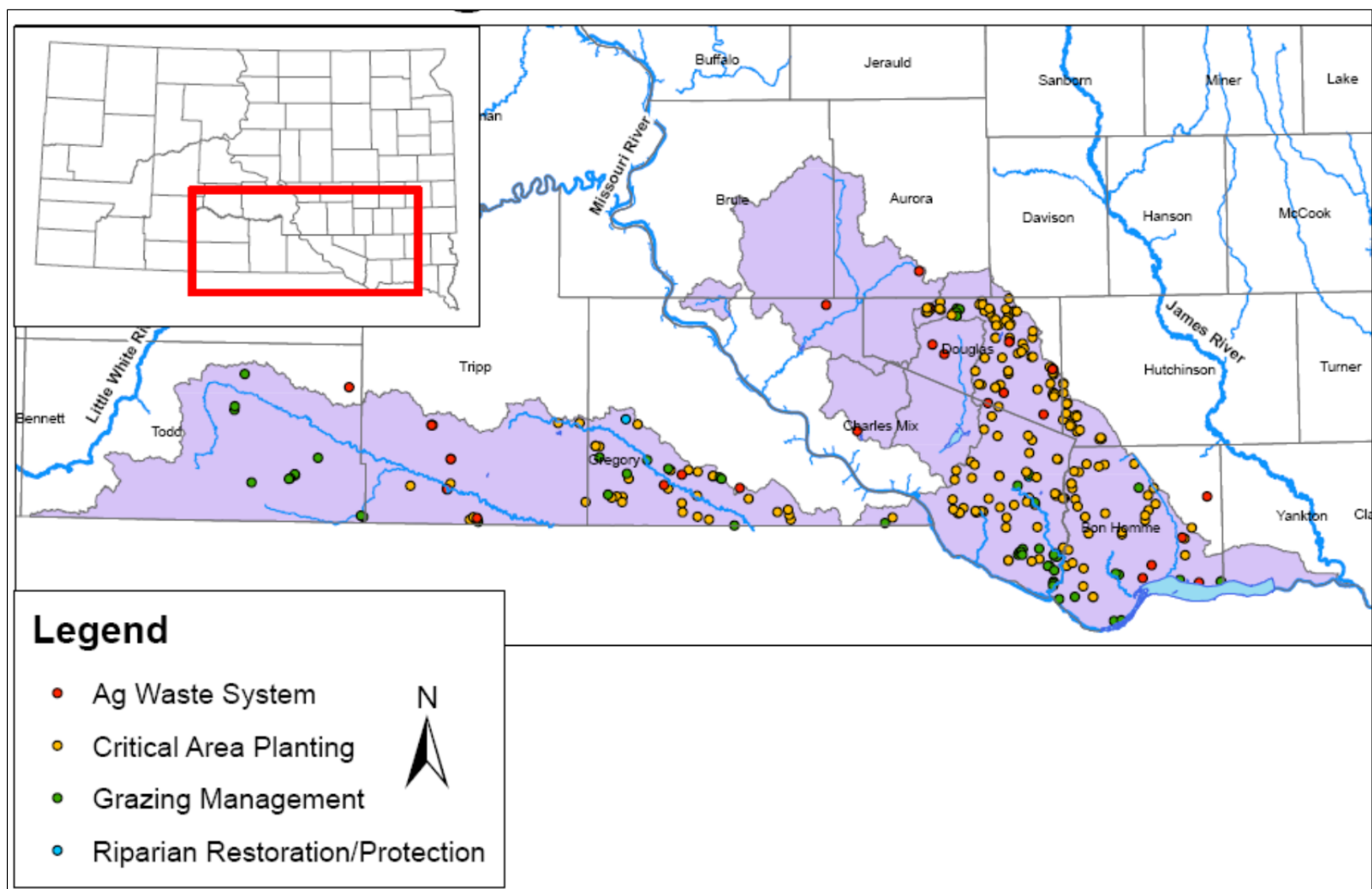


Figure 5. Location of BMPs Installed During Project Segment 2.

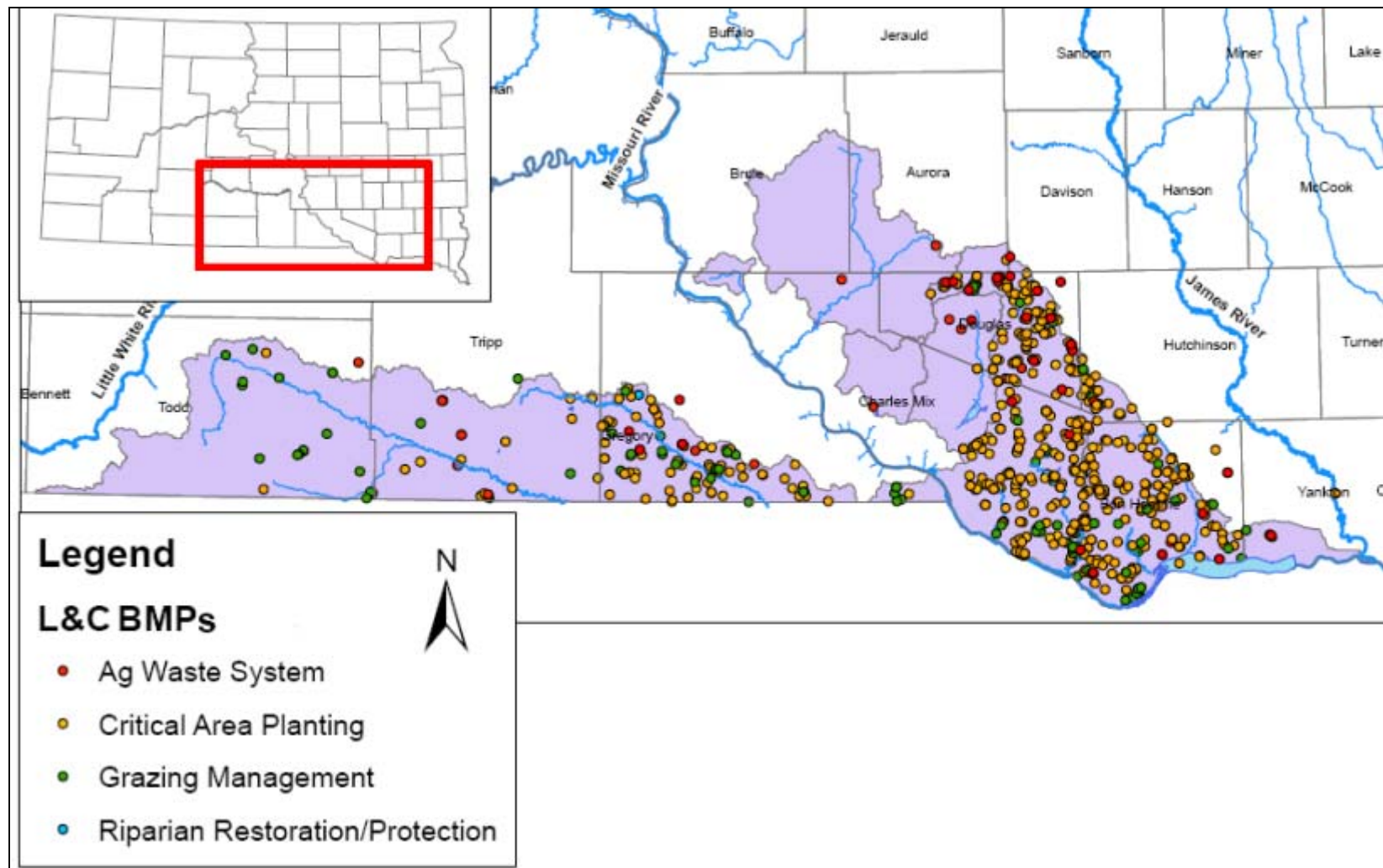


Figure 6. Location of BMPs Installed During Project Segments 1 and 2.

Objective 1: Reduce nutrient, sediment and fecal coliform loading in the Lewis and Clark Watershed and the Lake Andes Watershed through the installation of best management practices.

Task 1: Plan and implement cropland and grassland best management practices (BMPs).

Provide assistance to landowners with the installation of BMPs on cropland and grasslands to reduce fecal coliform bacteria, nutrient, and sediment loadings. BMPs will be targeted to critical cells identified in the watershed assessment.

During Project Segment 1, the installation of cropland BMPs was more prevalent than grassland. The preference reversed during the second. See Figures 4 and 5. The shift to grassland BMPs was related to three major factors:

1. The predominance of row crop agriculture in the subwatersheds east of the Missouri River where project implementation was initiated immediately after project start-up.
2. With the west river subwatershed added to the project area, livestock based agriculture became a larger portion of the farms and ranches. And, systems planned during Segment 1 but not installed, were completed.
3. The use of Section 319 funds for the installation of cropland BMPs was limited during Project Segment 2.

See Table 4 for the practices used to install cropland and grassland BMPs, Table 5 for the BMPs installed by impaired waterbody (= subwatershed/TMDL). Nutrient and sediment load reductions realized from the BMPs installed are listed in Table 6. Fecal coliform and E. coli reductions were not monitored during either project segment 1 or 2 and therefore, are not included in the data presented. Table 9 located in the Monitoring and Evaluation section and the milestone comparisons at the end of the descriptive summary for each product (Table 5) provide information regarding BMPs and units of each practice installed to those planned.

Grouping the load reduction data by Missouri River Reservoir receiving the NPS pollutants from project subwatersheds was determined a practical way to present BMP installation and load reductions realized as of the 17 project waterbodies listed (Table 1) as requiring a TMDL when the project was initiated:

- ten have been delisted because of listing criteria change, i.e., TSI or data collected subsequent to the listing indicated the parameter is not exceeded,
- TMDL water quality assessments have either not been completed or there is insufficient data for four waterbodies and
- NPS loads from 13 of the subwatershed are deposited into Lewis and Clark Lake; the remainder Lake Francis Case, therefore implementing a TMDL for either waterbody requires load reductions from the respective clusters of subwatersheds.

During Project Segment 1, most Cropland BMPs were installed using funds provided by the Conservation Reserve Program (CRP), which has the beneficial facet of a fifteen year rental payment on land enrolled in the program. Section 319 funds were used to install grassed

waterways on fields that did not meet the cropping history requirement of the CRP program. The cropland BMPs included the adoption of tillage practices that reduce NPS loading. Producers adopting the practice agreed to use reduced or no till practices for a ten year period. Costs associated with tillage practices were for design of the practice with no cost share for implementation.

The use of Section 319 funds for cropland BMPs was not allowed during Segment 2 by DENR. The department has concluded that cost share funds to install cropland practices such as grass waterways, farmable wetlands, and field windbreaks were readily available. However, as funds for grassland BMPs and project administration and technical assistance were not Section 319 funds should be directed toward these activities to ensure TMDL implementation was not delayed.

The installation of grassland BMPs required livestock exclusion for all of the riparian areas controlled by the producer. The use of CP-30, a practice of the CRP program, made this requirement attractive for producers. CP-30 pays a rental rate for the excluded area and allows a higher cost share rate for fencing than could be offered using Section 319 or other sources of funds such as those available from GFP and FWS. To access technical and financial assistance to install pipelines, tanks and cross fencing, two of the producers assisted during Project Segment two agreed to install grazing management practices that excluded livestock from several miles of Lewis and Clark Lake shoreline.

Priority to plan and install grazing BMPs that excluded livestock from waterbodies was given to operations for which the affected stream/creek was located within five miles of a TMDL waterbody. The preferred alternate source of water tapped to service the systems varied by location - east or west of the Missouri River. East of the Missouri River rural water systems were the preferred and the only source tapped. Wells were dug west of the river as many areas are not served by rural water. Wells drilled have all been less than 200 feet deep. When a new well is drilled, the producer assisted is required to seal two abandoned wells.

System size was also related to side of the river. Systems averaged 440 acres east of the river; averaged 2,270 acres west of the river.

Tree planting were cost shared if grazing was excluded from riparian areas. The tree plantings provide protection from the elements during winter months as access to wooded breaks along waterways is no longer available. It is anticipated that tree plantings will increase during Project Segment 3 as more of the systems installed will be in the west river portion of the project area.

Technical assistance for the design of grazing systems was provided by NRCS, the Section 319 funded Grasslands Management and Planning Project and Lewis and Clark project staff.

The primary sources of financial assistance for the installation of managed gazing systems were Section 319, EQIP and FWS. GFP funds were used to install grazing practices when a producer indicated that participation in the program would not occur if cost share funds were from a federal program/agency. GFP paid cost share directly to the producer.

An example of a grazing system plan developed during this project segment is shown in Figure 7; water source Figure 8 and a cross fence installed to exclude grazing in a riparian area Figure 9.

The acres benefiting from the BMPs installed are shown by subwatershed cluster in Table 5 (Page 23). Load reductions realized from the reductions area located in Table 11.

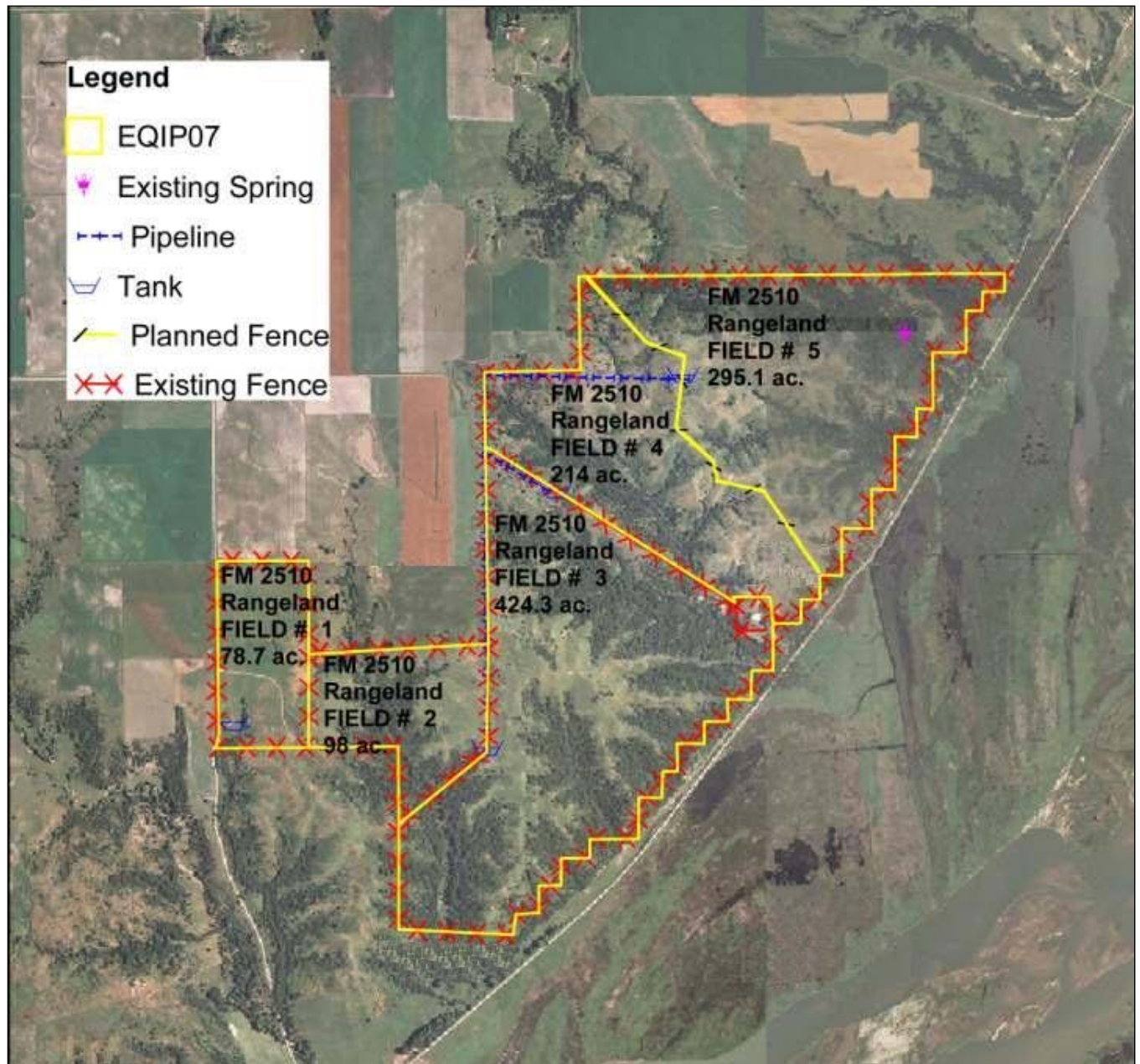


Figure 7. Grazing System Plan.



Figure 8. Water Tank Made From Recycled Tire.



Figure 9. Fence Constructed to Exclude Grazing in the Riparian Area.

Table 5. BMPs Installed During Project Segment 2 by Subwatershed Cluster.

Watershed	Subwatershed	BMP				
		Cropland	Grazing		Livestock Feeding Systems	
		Acres Benefited	Acres Benefited	LF Riparian exclusion	AWMS	Winter Feeding Area
Lake Francis Case						
	Lake Andes	10.8				
	Academy Lake					
	Platte Lake				1	
	Geddes Lake				1	
	Lake Francis Case				1	
Total Lake Francis Case		10.8			3	0
Lewis and Clark Lake						
East						
	Choteau Creek	8,024.7	1,539.7	3,230	4	
	Corsica Lake					
	Dante Lake	22.2				
	Emmanuel Creek	715.1	502.4	5,780		
	Slaughter Creek	348.6				
	Lewis and Clark Lake	2,153.7	1,368.7	9,814	3	
Total East		11,264.3	3,410.8	18,824	7	0
West						
	Ponca Creek	2,111.2	704.6	34,737	1	
	Roosevelt Lake					
	Keya Paha River	641.9	1,659.7	19,684		3
	Rahn Lake					
	Sand Creek		133.8			
	Antelope Creek		916.2	14,302		
	Snatch Creek					
	Burke Lake					
	Other Areas		375.8		1	
Total West		2,753.1	3,789.4	68,723	2	3
Total Lewis and Clark		14,01.4	7,200.2	77,783	9	3
Project total		14,028.2	7,200.2	87,547	12	3

Milestones: Planned – Accomplished:

BMP/Practice	Planned	Accomplished
Cropland BMPs (Acres Benefited)	10,000	14,028
Prescribed grazing (Acres Benefited)	4,000	7,201
Livestock Exclusion (Linear Feet)	0	87,547

Task 2: Reduce fecal coliform loadings originating from animal feeding operations.

Product 3: 12 animal waste management systems (AWMS).

Twelve AWMS and three riparian winter feeding areas were constructed at animal feeding operations (AFOs) during the project period. Sources of cost share funds accessed during Project Segment 2 were EQIP, Section 319, Consolidated and SRF.

The winter feeding areas were installed in the west river portion of the project area. The location of the feeding area was selected based on the best location for planting trees and/or building fabricated wind breaks. Local conservation district staff, NRCS personnel and the project coordinator worked as a team to determine the location.

The 12 AWMS includes three systems designed but not constructed during Segment 1. Six systems, for which designs were completed during this project segment but not installed, will be constructed during the next project segment. Construction of these systems was delayed because of wet conditions, to include flooding along the Missouri River, during spring and into summer 2011.

The NRCS Ag Waste Management Team designed five of the systems; NRCS certified TSPs designed the remainder. Nutrient management plans for the systems were prepared by NRCS district conservationist.

Cost share for the design and construction of a system was limited to 75 percent or a maximum from Section 319 funds of \$187,500 at the beginning of Project Segment 2. In recognition of a decrease in the sources of potential cost share funds and the increase in construction costs related to increased fuel costs, the dollar amount was changed to a combined Section 319 EQIP maximum of \$200,000 near the end of the project segment.

Relocation of a system often required “dirt work” that doubled construction cost. The construction of all systems installed involved at least a partial relocation. In one instance, finding a suitable site for the system required moving the feedlot 11 miles.

AWMS design and construction assistance was provided based on the ranking system referenced previously. Systems with scores in the top fourth of the list were given priority. Systems ranked 1, 3, 5, and 8 were designed and constructed during Project Segment 1; those ranked 2, 4, and 6 during Segment 2. The remaining systems constructed ranked among the top 15 percent of the total priority operations identified.

Livestock producers selected from four system types. The type of system recommended was based on size of the operation, location, the operator's management capabilities and finances.

The system types and number constructed during each project segment are shown in Table 6. Hoop, (Figure 10) monoslope (Figure 11) and vegetative treatment area (VTA) based systems all give the producer the advantage of not constructing what is often a large lagoon to catch and hold liquids that run off the open lots (Figures 13- Page 30). The lagoons (ponds) must be pumped and the liquids land applied.

For both hoop structures and monoslope barns, the lagoon is replaced with manure stacking area and basin to collect liquids from the stacking area. With a VTA, the lagoon function is replaced by channeling the liquids to a vegetated area sized to accommodate the anticipated amount of run off. The plant growth from the vegetated area is periodically harvested for forage.

Table 6. Types of AWMS Constructed.

System Type	Project Segment		Total
	1	2	
Open lot	17	8	25
Hoop structure	2	2	4
Monoslope barn	2	2	2
VTA	0	0	0
Total	19	12	31

Producers electing to build either a hoop or monoslope structure did so in order to address ground water concerns that have otherwise required relocation of the feeding operation.

Constructing hoop structures and monoslope barns to house cattle on feed has been found to provide the operators with improved community relations. The cattle on feed are not readily visible and odors associated with waste storage and land application of manure tends to be reduced. It has been found that area residents and visitors usually pass by without being aware the facility is an AFO.

Feeders changed from a preference of hoop structures during Segment 1 to monoslope barns during Segment 2. While both types of structures provide nearly identical benefits as a NPS pollution prevention BMP and increased livestock rate of gain over open lots, the monoslope has the added advantage of construction that will withstand higher wind velocities that accompany summer thunderstorms. For example, the fabric cover of some hoop structures was damaged beyond repair. Replacement of the fabric cover negated the initial construction savings that selecting hoop structures gained over the cost of building a monoslope barn.

Milestone Planned – Accomplished

BMP/Practice	Planned	Accomplished
Systems Designed	5	15
Systems Installed	16	12
Nutrient Management Plans	12	11
Riparian Winter Feeding Areas	2	3



Figure 10. Hoop Structures Have Many Uses at the Feeding Operation.



Figure 11. Monoslope Barns Became the Feeders Choice.

Objective 2: Provide project and BMP information to a minimum of 100 watershed landowners, 20 watershed organizations, and 2,500 area citizens to inform them of this project's need and progress and the results and recommendations from the Phase 1 Watershed Assessment.

Task 3: Implement an Information and Education campaign to inform the public and stakeholders on project need and progress, results, and recommendations of the Watershed Assessment Final Report.

Product 4: Information and education campaign of informational meetings (2), tours (2), newsletters (4), steering committee meetings (2) and press releases (4).

The project coordinator, working in partnership with the Randall RC&D, conservation districts and NRCS district personnel continued to provide resource managers and project area resident's opportunities to learn about the project at workshops, tours and through the media. Project activities planned versus accomplished are summarized in Table 7. The table also includes the number of individuals reached by each activity.

Because of the phase out of the RC&D Program, many of the records of attendance at outreach activities are not available. Therefore, the number of individuals reached is based on records available and estimates provided by individuals involved with planning or hosting the activity.

Table 7. Outreach Activities Milestone Comparison.

Activity	Project Segment 2		
	Planned	Completed	Individuals Reached
Informational Meetings	4	19	380
Press Releases	4	4	NA ¹
Presentations	30	30	410
Newsletters	4	3	NA
Steering Committee Meetings	2	2	33
Tours	2	5	100
Total			

1 – Not Available

A comparison of the cumulative number of outreach activities planned to accomplished is included in Table 10 located in the Monitoring and Evaluation section of this report.

Many of the activities completed during this project segment were a continuation of activities initiated during previous project segment and built on previous success. Therefore, the information that follows is a summary of outreach and educational activities completed during all project segments.

The purpose and outcome of the activities is summarized in Table 8. Selected activities representative of the project information transfer program follow.

Table 8. Outreach Activities Summary.

Activity	Coverage/Distribution	Purpose	Result
Meetings Informational Steering Committee	Project area. Representatives from participating agency conservation district, and organization.	Offer opportunities for assistance. Project coordination and evaluation.	Informed project area residents and BMP installation.
Workshops Conservation and Wildlife Habitat Holistic Grazing School	Primarily Lake Andes Watershed. Held in Amour but open to all area residents.;	Information regarding agency priorities and financial and technical assistance available. Integrated resource management.	BMPs installed. Improved grassland/riparian area management..
Press releases	Mostly weekly news papers in the project area	Project information and opportunities for involvement.	Outreach activities well attended; BMPs installed exceeding established milestones.
Newsletters	Project area conservation districts (11) and the Randall and South Central RC&D program areas.	Project information and opportunities for involvement.	Outreach activities well attended; BMPs installed exceeding established milestones.
Presentations Charles Mix Lake Assoc. Missouri rivers Futures	Lake Andes Watershed Resource managers and interested individuals.	Project awareness/progress and opportunities for involvement. Coordinate/accelerate actions being taken to protect natural resources in this portion of Missouri River Watershed.	Lake clean up day(s); BMPs installed.. Coordination of agency actions to attain the individual goal (s) of each.
AWMS tours	Five locations in the project area.	Information regarding what an AWMs is and how to access assistance to install a system.	Planning and construction of AWMs exceeds the milestones for both this and previous project segments.
Displays Rancher's Workshops	White river and Winner areas	Information regarding the project and assistance offered for BMP installation.	Managed grazing systems installed in west river portion of the watershed these exceeded both the number of and total acres expected..
Project brochure	Eleven county project area.	2009 updated to include Lake Andes subwatershed; 2010 updated to include the Platte, Geddes and Academy Lake subwatersheds..	Informed project area residents and project milestones exceeded.

The Randall RC&D and several project partners hosted a multi-organization workshop in Lake Andes to bring together all the organizations with conservation or wildlife programs and incentives for private landowners. Those involved in giving presentations were the USF&WS, NRCS, FSA, Pheasants Forever, SD GFP, SDACD, Randall RC&D, Charles Mix Conservation District (CD), and the Charles Mix County Lake Restoration Organization (CMCLRO). The workshop resulted in landowners and agency participants gaining a better understanding of the priorities and financial and technical assistance available from each agency.

A presentation about the Lewis and Clark Watershed Implementation Project (L&CWIP) was given by the Randall RC&D Council Coordinator to the nearly 200 attendees at a dinner meeting sponsored by the (CMCLRO). The organization sponsored a lake clean-up day the next weekend.

A presentation about the scope and accomplishments of the L&CWIP was given by the Randall RC&DC Council member at a multi-organization meeting at Ponca State Park sponsored by the Missouri River Futures Organization. The meeting was held to share information regarding each participating agency's goal and accomplishments during the past year toward attaining the goal.

Randall RC&D Council members serve on the Missouri River Action Partnership (MRAPS) committee, the Conservation Districts Missouri River Sedimentation Committee and attend SD NPS Task Force Committee meetings. During the meetings, individuals representing the council shared information relative to their activities and discuss how they might coordinate efforts to facilitate attaining each entities goals.

A feedlot tour was held in Bon Homme County, co-sponsored by Randall RC&D and the Bon Homme County CD, to provide 20 livestock feeders and interested individuals the opportunity to see how a system is constructed (Figure 12) and operated (Figure 13). As a result of the tour, one of the producers in attendance installed an AWMs.

Producer meetings were held in Tyndall, Armour, and Winner as the project area was expanded to provide information regarding the project and financial and technical assistance opportunities available to install BMPs. Attendance at each meeting averaged approximately 30 producers and led to BMP installation through initial contacts established at the meetings.

A holistic grazing workshop was sponsored in Armour and was well attended by local producers.

Examples of selected information transfer and education products can be found in Appendix A of this report.

Objective 3: Completion of water quality monitoring, monitor project progress and complete project administration and management to document project progress towards objectives and meet administration policy and guidelines.

Task 4: Monitor water quality through water quality sampling related to BMP installation and after storm events to assess changes in water quality from BMPs and from the initial watershed sampling.



Figure 12. Project Staff Explain How an AWMS Waste Storage Lagoon Functions.



Figure 13. Feedlot Tour in Bon Homme County.

East Dakota provides a summary of the each year's volunteer water quality monitoring activities to Discovery Center.

A copy of the report is available by accessing:

<http://eastdakota.org/dakotawaterwatch/ArchivedData.html>

The data collected is provided to DENR for entry into STORET.

Sampling at Lake Andes continued during 2009, 2010 and 2011 with samples collected over a seven month period (April through October) each year. Samples were taken at three sites each month for a total of 21 samples during project Segment 2. Water quality parameters monitored during each sampling period included a Secchi depth measurement, a bacteria sample, water temperature, air temperature, a wind direction, cloud cover, recent precipitation, water level, presence of invasive species, water color and odor.

Secchi disc readings for the months July – October during 2008 – 2010 are shown in Table 9.

Table 9. Lake Andes Secchi Disc Reading in Meters.

Month	Year		
	2008	2009	2010
July	0.27	0.40	0.33
August	0.37	0.15	0.27
September	0.33	0.14	Obscured by algae
October	0.29	0.43	0.27

Of the 21 bacteria samples taken during 2010 and 2011, fifty-two percent detected the presence of E. coli. This is an increase from 2009 when six of 18 samples (33%) contained detectable numbers.

The E. coli levels were well below both the EPA and South Dakota standards. The increase in E. coli is projected to have resulted from record rainfall received in 2010 and 2011.

Task 5: Monitor progress, complete progress reports and complete grant administration to meet project requirements and guidelines.

Product 6: Semi-annual (2), annual (2) and final (1) reports completed according to grant guidelines and requirements.

Annual reports were submitted to DENR using the electronic report form developed by the department to facilitate entry into GRTS. The reports included a comparison of planned to accomplished milestone status, a narrative summary of accomplishments by task, conclusions, evaluation of progress and load reductions.

The project was on schedule. Therefore, mid-year reports were not required and none were submitted.

An application was prepared and submitted to request Section 319 funding for a third project segment. The application was recommended for funding by DENR and the SD NPS Task force. After approval by the SD Board of Water and Natural Resources and EPA Region 8, a PIP was developed to guide completion of Project Segment 3.

This report fulfills the requirement to submit a final report. The report will be transmitted both electronically and in print form.

Milestones Planned Accomplished:

Activity	Planned	Accomplished
Mid -year reports	3	0
Annual reports	3	3
Final Project Report	1	1
Project implementation plan	1	1

MONITORING AND EVALUATION

Monitoring

Monitoring project progress was based on reaching project milestones. Monitoring activities included tracking:

- the source and use of funds expended,
- progress toward reaching project milestones as amended,
- load reductions realized from BMPs installed,
- progress toward implementation of TMDLs,
- documenting local support and partner records of cash and inkind contributions and,
- outcomes that resulted from outreach activities.

Financial information, milestone accomplishments and load reductions were monitored using the DENR Project Management Program (TRACKER). STEPL and the Feedlots and Grazing (FLGR) load reduction calculation spreadsheet developed by DENR were used to calculate load reductions realized from the BMPs installed.

A comparison of planned to milestones achieved is shown in Table 10.

Table 10. Milestones Planned Versus Accomplished Comparison.

BMP/Practice	Milestones					
	Segment 1		Segment 2		Cumulative	
	Planned	Accomplished	Planned	Accomplished	Planned	Accomplished
Cropland BMPs						
Total Acres Benefited	750	24,502	10,000	14,028	10,750	38,530
Grazing Management						
Planned Grazing (acres)	1,500	8,859	4,000	7,201	5,500	16,060
Livestock Exclusion (feet)	0	0	0	87,547	0	87,547
Riparian Area Management (RAM) (acres)	0	0	50	0	50	0
Ag Waste Systems						
Engineering Design	8	22	15	15	23	37
Nutrient Management Plan	8	33	12	11	20	43
Riparian Winter Feeding Area	0	0	2	3	2	3
System Construction	8	19	16	12	24	31
Information and Education						
Informational Meetings	4	12	8	19	16	27
Press Releases	6	8	4	4	10	12
Presentations	20	22	30	30	50	52
Newsletters	0	0	4	3	4	3
Steering Committee Meetings	0	0	2	2	2	2
Tours	3	4	2	5	5	5
Water Quality Monitoring (Samples)	0	0	24	24	21	21
Total Load Reduction/yr.						
Nitrogen (lbs)		389,754		325,604		715,358
Phosphorous (lbs)		107,834		87,924		195,758
Sediment (tons)		52,340		37,067		89,407

Water quality monitoring activities completed were completed in the Lake Andes subwatershed by volunteers through participation in the SD Volunteer Monitoring Program

The data is insufficient to serve as the basis for evaluating the effect of project activities on load reductions associated with BMP installation in the Lake Andes subwatershed.

Water quality monitoring as a tool to evaluate BMP effectiveness was not completed during either Project Segments 1 or 2. The sponsor recognizes the importance of verifying model data with field data and is initiating actions expected to provide the funds and personnel necessary to complete the activity. – See recommendations presented later in this report.

Monitoring results were reported to DENR for entry in GRTS using the DENR Project Tracker reports function.

Water quality monitoring activities completed were completed in the Lake Andes subwatershed by volunteers through participation in the SD Volunteer Monitoring Program

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Monitoring results were reported to DENR for entry in GRTS using the DENR Project Tracker reports function.

Evaluation

The data collected through monitoring activities indicate that:

- BMPs offered were those producers would accept as cost effective tools that will provide economic sustainability to their operation while yielding environmental benefits to water resources in their area,
- BMP installation milestones, with the exception of that for RAM, were met or exceeded (Table 10),
- BMPs are being installed in project areas where they will support TMDL implementation (Figures 4, 5 and 6 and Tables 5 and 11) and
- outreach milestones actions completed have resulted in successful information transfer and resulted in:
 - BMP installation exceeding milestones and
 - ongoing support of the project by area residents.

A review of project administration indicates that the project sponsor and staff:

- have built the financial and technical assistance partnerships network required to ensure project success,
- complied with DENR project requirements such as use of the department's computerized project management program, offering Section 319 cost share only for authorized BMPs and not exceeding the maximum cost share allowed for a BMP, and
- proactively addressed the challenges encountered by:
 - amending the PIP to fund BMP installation in watersheds added to the project area,
 - increasing project staff to provide technical assistance in an efficient and timely manner and
 - recognizing the need to identify a new lead project partner (sponsor) as the RC&D Program was discontinued.

LOAD REDUCTIONS

Step L and FLGR spreadsheets developed by EPA Region 5 and DENR were used to calculate nutrient and sediment load reductions realized from BMP installation (Table 11). Refer to Table 1 for information relative to parameters exceeded and reductions needed to implement the TMDLs for the waterbodies listed.

While the calculated reductions indicate that progress toward implementing the TMDLs is expected to have occurred, the data is either, or a combination of, not available, insufficient or comparable to the reduction(s) necessary to implement the TMDL for a particular waterbody. For example, the Ponca Creek TMDLs are based on zone and flow.

In addition, the reductions are based on calculations for an entire subwatershed or specific portion thereof and not substantiated by field samples collected at the sampling sites used to collect data during the TMDL assessment.

Table 11. Load Reductions Realized From BMPs Calculated Using STEPL and FLGR.

Watershed	Load Reduction Calculated Using STEPLs								
	Segment 1			Segment 2			Cumulative		
	N lbs	P lbs	Sediment Tons	N lbs	P lbs	Sediment Tons	N lbs	P lbs	Sediment Tons
Lake Francis Case									
Francis Case	*			3,310	370	4	3,310	370	4
Lake Andes	1,510	474	334	79	27	21	1,589	501	355
Academy Lake									
Platte Lake				16,373	3,684	7	16,373	3,684	7
Geddes Lake				13,391	3,013	28	13,391	3,013	28
Total Francis Case	1,510	474	334	33,153	7,094	60	34,663	7,568	394
Lewis and Clark Lake									
East									
Lewis and Clark	61,477	17,687	10,599	107,827	27,441	9,616	169,304	45,128	20,215
Choteau Creek	147,184	37,382	13,400	79,162	20,735	8,922	226,346	58,117	22,322
Corsica Lake									
Dante Lake	568	164	111	139	59	45	707	223	156
Emmanuel Creek	10,646	3,311	2,411	5,991	1,930	1,452	16,637	5,241	3,863
Slaughter Creek	5,456	1,535	1,198	2,427	837	643	7,883	2,372	1,841
Other areas	83,193	22,539	10,687				83,193	22,539	10,687
Total East	308,524	82,618	38,406	195,546	51,002	20,678	504,070	133,620	59,084
West									
Ponca Creek	74,694	23,178	12,536	70,687	23,141	13,351	145,381	46,319	25,887
Roosevelt Lake	300	72	50				300	72	50
Keya Paha River	741	223	159	18,799	4,858	2,489	19,540	5,081	2,648
Rahn Lake									
Sand Creek	1,627	537	386	177	51	55	1,804	588	441
Antelope Creek	446	14	71	7,242	1,778	434	7,688	1,792	505
Snatch Creek									
Burke Lake									
Other areas	233	93	64				233	93	64
Total West	78,041	24,117	13,266	96,905	29,828	16,329	174,946	53,945	29,595
Total Lewis and Clark	388,075	107,209	52,006	325,604	87,924	37,067	713,679	195,133	89,073

*Data Not Available

BEST MANAGEMENT PRACTICES DEVELOPED OR REVISED

The project was designed to implement TMDLs using established practices, therefore, BMP development and/or revision was not a planned activity nor were any developed or revised

However, the installation of practices used to construct the BMPs selected by producers:

- demonstrate the effectiveness of the grazing and winter feeding area BMPs as a NPS reduction tool for livestock producers,
- provide information regarding the selection and placement of practices to achieve reduction of nutrient, sediment and fecal coliform bacteria loads to TMDL waterbodies from winter feeding areas and
- increased the acceptance of managed grazing and winter feeding area BMPs as livestock producers found that the BMPs were cost effective actions that, in most instances, improved herd health and operation profitability.

RELATIONSHIP TO MANAGEMENT PLAN

Activities completed during this and the previous project segment support attaining the SD NPS Program goal as outlined in the SD NPS Management Plan. Examples of support provided by the Lewis and Clark Watershed Implementation Project include but are not limited to the following SD NPS Management tasks:

Task 3 – Provide the public and resource management professionals with water quality information and the opportunity to participate in the TMDL approval process.

Project area residents and organizations are encouraged to participate in the SD Volunteer Monitoring Program offered through the East Dakota Water Development District with financial assistance from the SD Discovery Center and Aquarium's Section 319 Information and Education Grant. Data collected by volunteer monitors is submitted to the East Dakota who, in turn forwards the data to DENR for entry in STORET and use in supporting listing a waterbody as impaired, develop a TMDL or delisting if water quality parameters are not exceeded.

Information about the volunteer monitoring program is available by accessing either of the web sites listed below:

<http://www.sd-discovery.com/WQM.htm>

<http://denr.sd.gov/dfta/wp/SoDakCitizenMonitors.aspx>

Members of the Charles Mix Lake Association are currently active in monitoring water quality of Lake Andes.

Task 4 – Develop and begin implementing project implementation plans for approved TMDLs within two years of approval.

The Lewis and Clark Watershed Implementation Project is designed to begin installing BMPS in subwatersheds located within the project area boundaries as the sources of impairment are identified and made available to the project partners. See Tables 1 and 11 for TMDL implementation status and load reductions realized respectively.

Task 5 - Provide assistance and oversight to ensure the completion of watershed projects that attain TMDL implementation goals according to the milestones established during the project planning period.

Project staff enters financial and BMP Implementation Data into the DENR NPS Management Tracking System (Tracker) and report progress toward milestone accomplishment and load reductions realized for entry in the EPA Grants Reporting and Tracking System (GRTS). Load reductions reported are calculated using STEPL. Annual reports submitted by the project sponsor for entry into GRTS are available by accessing:

<http://iaspub.epa.gov/pls/grts/f?p=110:199:0>

Task 6 – Maintain a working relationship with financial and technical assistance partners.

The sponsor formed a steering committee, with representation from local, state and federal agency and organization partners to coordinate project activities with its partners. Table 12, located in the Coordination section, identifies the project partners and financial and/or technical assistance each provided.

Task 8 – Provide financial and technical assistance for the development and completion of projects that implement TMDLs or clusters of TMDLs on a 12 to 8 HU basis.

DENR and local, state and federal resource agencies and organizations are partnering to implement a cluster of TMDLs located in four, eight digit HUs:

- Keya Paha - HU 1015006;
- Lewis and Clark Lake - HU 10170101,
- Ponca - HU 10150001 and
- Lake Andes – 10140101

Table 12, located in the Coordination section of this report identifies the project partners and financial and/or technical assistance provided.

In compliance with DENR’s project sponsor requirements, project staff:

- use DENR’s NPS Project Management Tracking System
- secure Section 401, 404; 402 stormwater permits prior to BMP installation,
- comply with cultural and threatened and endanger species clearance requirements,
- attend training sponsored by DENR,
- prepare and submit annual reports for entry into GRTS,
- participate in onsite reviews conducted by DENR and
- submit annual reports to DENR.

Task 11 – Provide leadership needed to coordinate and maximize support necessary to develop and implement TMDLs on watershed basis.

The project is designed to implement TMDLs in an area that encompasses a cluster subwatersheds (Figure 3) located in four HUs.

The sponsor formed a steering committee with representation from 11 project partners. Committee members provide input and help coordinate the use of financial and technical assistance resources made available by local, state and federal resource management agencies and organizations (Table 12).

Task 13 – 14 –Evaluate watershed project progress toward TMDL development and implementation and project goals.

The sponsor evaluates progress toward reaching milestones and objectives, attaining the program goal identified in the plan and implementing TMDLs.

Annual reports are submitted to DENR. The reports contain a summary of:

- project activities completed,

- progress toward accomplishing milestone and
- load reductions realized from BMP installed.

COORDINATION

The Randall RC&D was the project sponsor. Project activities were directed by a coordinator provided through a management agreement with SDACD. The coordinator's activities were completed with day to day supervision and policy direction from the Randall RC&D Council.

In setting policy and program direction, the council used direct input from partner agencies, and organizations and meetings with the project steering committee.

The coordinator was responsible for the:

- day-to-day administration of the project,
- coordination of activities with project partners and staff,
- providing BMP planning and installation assistance to producers and
- monitoring and reporting project implementation progress to the RC&D council, project partners, DENR and project area residents.

Coordination to develop and review the accomplishments of cooperative agreements with partner agencies and groups was completed by direct interaction with the partner(s) party to the agreement. Among the partners with which the Randall RC&D Council had formal or informal cooperative agreements during the project period were:

- SD Discovery Center and Aquarium,
- Conservation Districts,
- SDACD,
- DENR,
- NRCS and
- USFWS.

Several local, state and federal agencies and organizations contributed financial and technical resources, both cash and inkind, to facilitate attaining the project goal. Participating agency contributions to the project are summarized in Table 12.

The partnerships developed with county conservation districts and NRCS offices may be the key factor that resulted in BMP installation milestones being exceeded. The working relationship that existed between the entities and the producers prior to the project increased local ownership.

The districts:

- made arrangements for meetings,
- assisted with direct mailing to producers,
- completed all tree plantings in this project area,
- assisted with BMP planning and implementation,
- were sponsors of Soil and Water Conservation Grants from the Conservation Commission,
- served as the entity through which cost share payments were provided to producers and
- will monitor compliance with BMP installation O and M requirements

Table 12. Project Partners Contributions.

Agency/Organization	Contribution
Nongovernmental	
Charles Mix Lake Association	Volunteer water quality monitoring. organize and host meetings.
Private sector technical assistance providers (TSPs)	BMP design services, especially AWMs.
Randall Resource Conservation and Development Association Council	Project sponsor through the Randall Resource Conservation and Development Association.
Rosebud Cattlemen's Association	Livestock grazing and nutrient management advocate west of the Missouri River. Inventory feeding operations in Gregory County.
SD Association of Conservation Districts	Provided interim coordinator through contractual services, technical assistance for administration and BMP planning through the 319 funded 303(d) Watershed Planning and Assistance Project. Financial assistance for BMP planning and installation and O & M compliance activities through a Farm Bill Implementation Technical Assistance grant from NRCS (commonly referred to locally as Farm Bill funds).
SD Discovery Center and Aquarium	Information and education activities and coordinated volunteer water quality monitoring program.
SD Grasslands Coalition	Design managed grazing systems through the 319 funded Grasslands Management and Planning Project.
Governmental	
Local	
Douglas, Aurora, Brule, Bon Homme, Hutchinson, Charles Mix, Gregory, Clearfield/Keya Paha, Todd, Yankton, Tripp, Clearfield, Douglas, Hutchinson, Yankton, Union, Gregory and Hamill Conservation Districts	BMP planning, to include maps and installation, and provide a "conduit" through which cost share funds are distributed to producers installing BMPs. Cosponsor SD Soil and Water Conservation Grant applications. Monitor compliance with BMP O & M requirements.
State	
SD Department of Agriculture	Financial assistance for BMP installation and technical assistance to conservation districts through the Conservation Commission's Soil and Water Conservation Grants Program.
SD Dept. of Game, Fish and Parks	Presentations at meeting and grassland BMP installation through the Partners for Wildlife Program.
SD DENR	Technical assistance and training with water quality sampling and data interpretation, project management and BMP installation through the 319 Program. Financial assistance for water quality sampling using of fee funds, Consolidated Water Facilities Construction Fund grant for AWMs, Section 401 and 404 and stormwater permits through Surface Water Program.
SD Historic Preservation Office and State Archeological Research Center	Cultural Resource clearance/surveys.
SDSU and SDSU Cooperative Extension Service	Information and activities, especially field days/tours.
Federal	
Randall RC&D	Project sponsor and clerical and administration services
US EPA	Financial assistance through Clean Water Act Section 319 project grants.
USDA FSA	Financial assistance for BMP installation through the CRP Program.
USDA NRCS	Financial and technical assistance for BMP installation through the EQIP Program. AWMs design services through the NRCS Ag Waste Management Team and certification of private sector technical assistance providers (TSPs).
USDI FWS	Technical assistance for grassland seeding, grazing systems, multiple purpose ponds and riparian fencing through the Partners for Fish and Wildlife Program and Annual appropriation for SD.

The partnership with NRCS was crucial to project success. NRCS:

- service center staff includes soil scientists, engineers, and range conservationists who facilitated meeting most technical assistance needs with personnel with which producers were familiar;
- tribal liaison personnel facilitated interactions with the Rosebud and Yankton Sioux Tribes who, in varying degrees, are involved with the management of land in the project area that is either owned by the tribe or held in trust for tribal members;
- certified private sector technical assistance providers (TSPs) thereby increasing the pool of BMP planners, especially for AWMSs) and
- provided computer hardware and software used to generate BMP plans, contracts, maps; and office space for the coordinators.

SUMMARY OF PUBLIC PARTICIPATION

Producers in the project area were notified of opportunities for involvement in the project using press releases, fact sheets, newsletters and direct mailings, at partner agency offices, producer meetings, and other public events. See the Objective 2, Task 3 in the Project Goals, Objectives and Activities and Table 12 in the Coordination sections of this report for detailed information and Appendix A for examples of selected outreach items produced.

The first informational meeting was held in Corsica at the start of the Corsica Lake segment, which drew thirty interested non-agency participants. The cross-section of resident's interests represented at the meeting included agricultural producers, lake users, and urban residents. Many expressed interest in the BMPs that were being proposed for the project.

Informational meetings were hosted at the beginning of Project Segment 1 and following each project area expansion. At the start of each project expansion, a public meeting was held to inform both urban and rural project area residents of the goal and benefits and opportunities offered by participation in the Lewis and Clark Lake Implementation program. Tyndall was selected as the site of the east river expansion meeting; Winner the west.

Selection of BMPs that best fit the project area was a major outcome of the east and west river expansion meetings. BMP selection at the east river meeting centered more on options for reducing loads from cropland and livestock feeding operations, to include both AFOs and CAFOs.

West of the Missouri River livestock grazing and cereal grain production dominate. Livestock are commonly wintered in breaks along river and creek bottoms. While the practice is essential to provide protection from the elements in range country, spring snow melt and rain carry manure into the waterways and often make calving in the bottoms difficult. As a result of producer input concerning the need for continued use of the bottoms for wintering livestock, but also recognizing the need to reduce NPS impacts associated with the practice, the preferred practices proposed and later adopted, were those that would reduce NPS loadings originating from winter feeding areas. The practices selected to install a livestock winter feeding BMP included planting trees for livestock protection, fencing to exclude livestock access to the stream and river channels and installing pipelines and tanks to provide livestock water.

The addition of the Lake Andes Watershed to the project area brought with it an active lake association. The Charles Mix Lake Association has taken an active role in promoting practices that reducing nutrient loads entering the lake provided local leadership for a volunteer water monitoring program.

ASPECTS OF THE PROJECT THAT DIDN'T WORK WELL

In general, there were considerably more project positives than negatives.

All milestones established at the start of project were met or exceeded by producer participation. Most of the problems encountered were associated with coordination of agencies rather than producer involvement issues. The level of involvement by conservation districts necessitated a learning period to implement the management structure required to carry out their role. The Conservation Districts were a contact point where producers ask questions about funding practices. The districts made payment directly to the producers using pass-through funds provided by the Project. Once the districts became familiar with the practices offered and handling funds, this partnership became a strong point of the project giving a local face and involvement to the large area covered by the project.

Another challenge encountered was finding engineers to design animal waste systems. Engineers from NRCS were used initially but the project had more designs that NRCS could accommodate which necessitated employing a TSP to cover workload. The arrangement worked well until the TSP became overbooked leading to delays and additional construction costs and for which producers were not prepared. This firm is no longer employed by the project. Other firms are being evaluated with the intent of having more firms with fewer projects for each to complete. Currently there are two TSP firms that are working on AWMS designs for producers in the Lewis and Clark Watershed Implementation Project.

Hiring and retaining technical assistance staff needed to serve the large project area has proven to be a challenge. While attracting qualified staff to live in more sparsely inhabited rural areas is in itself difficult, retention becomes especially so when the employee is trained and experienced. While using a contractual agreement with SDACD has alleviated the challenge somewhat, the size of the project area makes providing technical assistance in a timely manner difficult when an employee leaves or is a new hire requiring at least six months to achieve proficiency.

USDA closed out the Resource Conservation and Development Program during this project segment. The Randall RC&D Council had sufficient resources to assume sponsorship for the project and has continued to serve as the sponsor during Project Segment 3. However, as the council's resources are diminishing, it will be necessary to secure a new sponsor. The project coordinator and members of the Randall RC&D council are currently in discussion with conservation districts that have expressed interest in assuming sponsorship.

RECOMMENDATIONS

Producers readily accepted the opportunity to install AWMS and exclude livestock from riparian areas. It is anticipated that these BMPs will continue as the practices of choice during subsequent project segments. To facilitate maintaining interest and provide operational support to animal feeding facility operators, the steering committee is considering hosting a workshop and conducting annual tours for the feedlot operators.

Acres of cropland BMPs installed exceeded the milestones established for this project segment. While operators of most of the cropland in the east river project area are adapting reduced tillage or no-till farming practices, some of the land closest to Lewis and Clark Lake remain under conventional tillage. Producers in the area still employing conventional tillage methods will be targeted. Activities included in the targeted approach are expected to focus on the advantages of reduced tillage and CRP options that would install riparian buffers.

The load reductions in this report were generated using STEPL and a spreadsheet developed by Tetra Tech, Inc. for EPA. Data collected in the field would add:

- credibility to the numbers calculated using the model and spreadsheet and
- justification for the funds being spent to install NPS reduction BMPs.

To accomplish this, initiating a water quality sampling program to verify reductions is being considered. Prior to collecting samples it is suggested that a two year time period should elapse to allow a BMP to become established. Providing a project coordinator with skills needed to manage a water quality project component is under consideration.

Maintaining the water quality improvements realized during this project will require continuing the information and education activities initiated during this project.

PROJECT BUDGET

The financial resources that facilitated attaining the project goal were contributed by several project partners. A summary of the contributions is shown in Table 13.

Table 13. Summary of Financial Contributions by Project Partners.

Grant Program	Source	319 Match	Amount (\$)		
			Total	Allocated	Used
Clean Water Act Section 319	EPA	No	885,000.00	885,000.00	885,000.00
Consolidated Water Construction Fund	DENR	Yes	130,000.00	130,000.00	130,000.00
Consolidated Water State Revolving Fund (SRF)	DENR	Yes	186,000.00	186,000.00	186,000.00
EQIP	USDA NRCS	No	1,018,000.00	1,011,000.00	578,735.00 ¹
Local Cash	Landowners/ non-agency partners	Yes	632,667.00	624,667.00	785,707.71
Local Inkind	Landowners/ non-agency partners	Yes	46,500.00	46,500.00	26,875.43
Other Federal	USFWS	No	77,446.00	77,446.00	2,822.00
Total			2,975,613.00	2,960,613.00	2,595,140.14

1 – Two systems funded entirely using 319 funds. Therefore, EQIP total used was less than planned.

During the project period the budget was amended four times. A summary of why the amendments were necessary follows.

Amendment 1 –The Section 319 grant award was not changed. The Platte Lake, Lake Geddes and Lake Academy subwatersheds were added to the project area. Line items within the budget were modified to increase funds allotted for information and education activities and add riparian area management as a cost shareable practice.

Amendment 2 –The Section 319 grant award was increased by \$150,000 to cover costs associated with adding a second full time technical assistance staff person to coordinate planning and install AWMS and grassland BMPs in the subwatershed added to the project area.

Amendment 3 The Section 319 grant award was increased by \$50,000 to cover costs associated with an extension of the project period.

Amendment 4 –Increased the Section 139 grant award by \$100,000 to address a short fall of funds for BMP installation related to requests for assistance beyond that anticipated and escalating cost of constructing AWMS.

A comparison of the budget as amended versus actual expenditures appears in Table 14.

Table 14. Budget Comparison – Planned vs. Expended as Amended.

Budget Item	Original	Amended	Expended	319	Other Federal	State – Local (Match)
Personnel						
Coordinator	201,600	178,500	78,037	78,037		
Support Staff						
SDACD/Randall RC&D	26,126	13,126	5,942	5,942		
Conservation Districts		3,000	100			100
Total Personnel	227,726	194,626	84,079	83,979		100
Office/Travel						
Office -space/Supplies/Equipment	38,360	17,000	8,856	8,857		
Travel	33,800	29,260	20,013	20,013		
Total Office/Travel	72,160	46,260	28,737	28,737		
BMP Installation						
<i>Cropland</i>						
Critical Area Planting	35,000	36,137	5,278	1,137	2,822	1,319
<i>Grassland</i>						
Grazing Management	64,000	151,000	146,169	109,627		36,542
Riparian Restoration/Protection			6,924	5,193		1,731
<i>Ag Waste Systems</i>	1,542,000	2,512,363	2,320,391	655,966	578,735	1,085,691
Total BMP Installation	1,641,000	2,699,500	2,478,762	771,923	581,557	1,125,282
Information and Education/Reports	12,000	12,000	3,328	128		3,200
Water quality monitoring	1,560	1,560	102	102		
Total Expenditures	1,954,446	2,953,946	2,595,140	885,000	581,557	1,128,583
Percent			100	34.1	22.4	43.5

CONCLUSIONS

As stated previously in the Monitoring and Evaluation section of this report:

The data collected through monitoring activities indicate that:

- BMPs offered were those producers would accept as cost effective tools that will provide economic sustainability to their operation while yielding environmental benefits to water resources in their area,
- BMP installation milestones, with the exception of that for RAM, were met or exceeded (Table 10),
- BMPs are being installed in project areas where they will support TMDL implementation (Figures 4, 5 and 6 and Tables 5 and 11) and
- outreach milestones actions completed have resulted in successful information transfer and resulted in:
 - BMP installation exceeding milestones and
 - ongoing support of the project by area residents.

A review of project administration indicates that the project sponsor and staff:

- have built the financial and technical assistance partnerships network required to ensure project success,
- complied with DENR project requirements such as use of the department's computerized project management program, offering Section 319 cost share only for authorized BMPs and not exceeding the maximum cost share allowed for a BMP, and
- proactively addressed the challenges encountered by:
 - amending the PIP to fund BMP installation in watersheds added to the project area,
 - increasing project staff to provide technical assistance in an efficient and timely manner and
 - recognizing the need to identify a new lead project partner (sponsor) as the RC&D Program was discontinued.

Based on the above, it can be concluded that:

During the completion of the PIP for developed to guide completion of Segment 2 of the Lewis and Clark TMDL implementation project, progress was made toward restoring the beneficial uses of surface waters in the Lewis and Clark subwatersheds through the installation of BMPs that target sources of sediment, nutrients and fecal coliform bacteria.

APPENDIX

Brochures, Fact Sheets, Press Releases, and Promotional Materials

Available Conservation Practices **Feedlots**

The Watershed Planning and Assistance Project has funding available to assist with feedlot engineering design (animal nutrient systems for animal feeding operations) on a cost-sharing basis. The Resource Management Specialists can provide further information.

Cropland and Grassland Practices

These include Filter Strips, Grassed Waterways, Tree Planting, Planned Grazing Systems, Fencing, Grass Seeding, Pipelines, Tanks, Ponds/Dugouts, Rural Water Hook-up, and Pasture/Grassland Buffers.

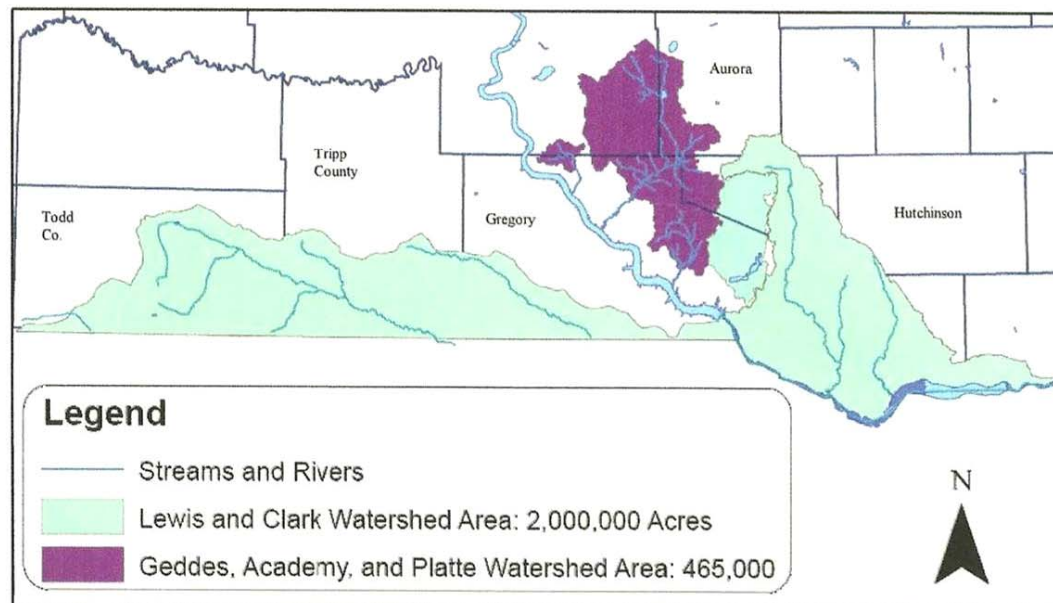
What to do if you want assistance or to find out more.

If you are located in the Lewis & Clark Watershed Project area, or think you might be, contact the following Conservation Districts:
Brule-Buffalo (Chamberlain) 605-734-5413
Gregory County (Burke) 605-775-2770
Hamill (Winner) 605-842-0603
Clearfield/Keyapaha 605-842-0603
Todd County (Mission) 605-856-4440
Aurora (Plankinton) 605-942-7719
Bon Homme County (Tyndall) 605-589-3232
Charles Mix (Lake Andes) 605-487-7577
Davison (Mitchell) 605-996-1564
Douglas County (Armour) 605-724-2846
Hutchinson (Menno) 605-387-5539
Yankton County (Yankton) 605-665-6704
Randall RC&D Office – 487-7077 Ext. 4

Lewis & Clark Watershed Implementation Project



Lewis and Clark Implementation Project Area



Sponsored by the Following:

Randall Resource Conservation and Development (RC&D); Lower James RC&D and South Central RC&D; The following Conservation Districts: Gregory County, Hamill, Clearfield/Keyapaha, Todd County, Brule-Buffalo, Aurora, Bon Homme County, Charles Mix, Davison, Douglas County, Hutchinson, and Yankton County Conservation District; SD Association of Conservation Districts (SDACD); Natural Resources Conservation Service (NRCS); and SD Department of Environment and Natural Resources (DENR)

Why We're Here

A Joint Effort to Reduce Pollution ~

The South Dakota portion of the Lewis & Clark Watershed consists of 1.9 million acres. A two-year Watershed Assessment was completed in 2005 that showed the conservation practices needed to reduce runoff water--water that travels through agricultural land, picking up chemicals, animal waste and eroded soil--eventually depositing the material in our rivers, lakes and streams. Other watershed assessments, since completed, have added an additional 465,000 acres with the addition of Geddes, Academy and Platte watersheds into the Implementation Project Area. The Lake Andes watershed was also added in 2009.

Because the risk of damage from these pollutants can be dramatically reduced through the application of proper land management practices, NRCS, SDACD, Conservation Districts and others have joined hands in the creation of the Lewis & Clark Watershed Implementation Project.

Focus: Impaired Water Bodies

This watershed project is focused on reducing sediment and pollution of all lakes and streams in the watershed. This includes Lewis and Clark Lake at the culmination of the tributaries.

How It Works

Lewis and Clark Watershed Project Area Landowners should contact the one of the Conservation Districts for an initial visit by the project's Resource Management Specialists.

The specialists provide the owners with

their operation, what assistance is available and the voluntary nature of the project.

The selected owners are offered assistance in developing a plan employing land management practices that will benefit their operation while improving water quality and reducing sediment within the watershed. The plan will concentrate on Best Management Practices, some or all of which may qualify the landowner for financial assistance in implementing those practices.

Program Neutral Planning Techniques

The Resource Management Specialists will utilize program neutral planning techniques. Program neutral planning is the development of a plan without regard to funding sources. This means that no specific fund source will be initially targeted. The result is a plan that better fits the needs of the landowner and the resource by not limiting funding opportunities to a single source whose qualification requirements may frequently change.

The Process

Planning assistance offered by the project includes:

- Conducting a survey of land's soil, water, plants, animals, air and cultural resources.
- Determining the landowner's needs and preferences
- Identifying land management alternatives
- Preparing a map of existing and planned

- Developing the landowner's preferred plan
- Selecting appropriate financial assistance sources
- Completing financial assistance application forms

In summary, the project's Resource Management Specialists offer a comprehensive service that includes developing a qualified land management plan as well as help in locating and applying for financial assistance.

Once the practices are funded, the funding agency and the landowner will be responsible for implementation of the practices.



This Watershed project is administered by the Randall RC&D Association, Incorporated. Major implementation funding is provided through a Clean Water Act Section 319 Grant.



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NEWS

For Immediate Release

July 19, 2010

Randall Resource Conservation and Development (RC&D)

Contact: Jeff Stewart, RC&D Coordinator

Lake Andes, SD (605) 487-7077 ext. 4

Email: jeff.stewart@sd.usda.gov

Ag Waste Open House

Clean water is something we all need and therefore it is important to protect and improve water quality. Ag Waste Feedlot systems are designed to keep manure and other contaminants out of clean water supplies. These systems catch all manure and water run-off from the feedlot area; they also allow proper utilization of manure as fertilizer, increase cattle gains, and promote a drier feedlot system. Did you know four inches of mud can decrease feed efficiency by 14%.

There are cost-share programs available for eliminating an existing feedlot system (that is contributing waste into a water body) and then moving to a new site and constructing a new full containment feedlot system. The Environmental Quality Incentives Program (EQIP) when coupled with local watershed programs can cost-share at least 75% of the costs to install an agricultural waste system.

On Wednesday, August 4th starting at 1:00 pm anyone interested in learning more about Ag Waste Feedlot systems is invited to attend an open house at the newly constructed facility on the Gary & Leonard Dvoracek property located ¼ mile south of the corner of 417th Ave and Hwy 52. Pull into the feedlot road on the east side. Snacks and drinks will be provided.

Sponsors of this event are the Bon Homme Conservation District, Bon Homme County Extension Service, the Natural Resource Conservation Service, Randall Resource Conservation and & Development Association, the SD Department of Environment and Natural Resources and the SD Association of Conservation Districts.

If you have any questions please call (605) 589-3232 extension #3. Thank you!

Agenda:

1:00 - 1:15	Introductions	Gary Dvoracek/Mark Rohlfing/Jeff Stewart
1:15 - 2:15	Ag Waste systems/nutrient management	John Lentz/Eric Barsness
2:15 - 2:30	Engineering	Justin Bonnema
2:30 - 2:45	EQIP	Mark Rohlfing
2:45 - 3:00	Lewis & Clark Funding	Rocky Knippling
3:00 - 3:15	Additional comments	Steve Sutura – Bon Homme Extension
3:15 - ?	Questions	

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L&CWIP Steering Committee Meeting

10:00 AM
December 16, 2009

Randall Community Water District Office

Tentative agenda items include:

Review Segment I and Segment I Expansion Grant
Goals and accomplishments (2006 to fall 2009)

Jeff, John, Rocky

Review Segment II L&CWIP milestones/goals
and grant requirements (fall 2009 to fall 2011)

John, Jeff, Rocky

Other Groups/committees working on the Missouri
River and tributaries (Missouri River Futures, MRERP
MoRAST, MRRIC, MSAC, etc.)

Theresa Smydra, Sandy
Korkow, others

Status of L&CW Assessment, final TMDL Report/Plan
and L&CWIP Segment 1 final report

Rocky

Specific conservation needs/opportunities
not being met on a District by District basis
Group

Les Labahn and

Discussion

Other agenda items?

L&CWIP Steering Committee Meeting
Minutes
December 16, 2009
Randall Community Water District
10:00 AM

Introductions were given (registration sheet **attached**).

Jeff opened the meeting with a PowerPoint on the history of the Lewis & Clark Watershed Implementation Project. In June of 2008, the Lake Andes Watershed area was added. The 2006-2009 Milestones/Goals were viewed. The project area was again expanded in 2007. Les explained how South Central Water Development District (SCWDD) helped by getting the 6-lake assessments completed.

The 2009 Nonpoint Source 319 Progress Report Form (GRTS EPA Report) on the Segment I Expansion grant was reviewed. (Attached)

An updated L&CWIP fact sheet and brochure were handed out (both attached)

A second watershed brochure will be completed this coming year and the website will be updated.

Referring to the last page (page 8) of the 2009 - 319 Progress Report Form, the report shows the pollutant reduction numbers. Rocky explained the AnnAGNPS and STEP-L models used to arrive at these numbers.

Jeff handed out and reviewed the latest EPA/DENR watershed approved grant (2010-2011, Second Segment grant). This grant was submitted in September of 2008 by Randall RC&D with great help from Lower James RC&D. The new grant we are now working under actually started on 6-4-09 and runs to 7-31-11. The budget and milestone table were reviewed by the group. (Attached). A new grant application will be due again in September of this year. We are actually in year 4 of a Project we said would take 10 years to complete to bring sediment and water quality to where it should be in the watershed.

Other Groups Working on Missouri River Issues—Jeff reported on Theresa Smydra's job and activities with the Missouri River Futures program. Most recently there was a MRF's meeting at Ponca State Park (Nebraska). Jeff and John Deppe gave presentations.

Many TMDL reports (Total Maximum Daily Loads) are on the DENR website. Some new ones include Fecal Coliform for Emanuel Creek, Total Suspended Solids for Emanuel Creek, and Total Suspended Solids for Keya Paha River. John Deppe said he has a copy of Dr. Howard Coker's report on moving sediment over Gavins Point Dam and down the river. (Copies available from John.)

Discussion about when the L&CW Assessment would be completed. Nobody knows for sure. The priority seems to be on individual parts now (TMDL's) of the watershed as noted previously.

The MSAC (Missouri Sediment Action Coalition) 2008 Summer Report was passed around. The Bad River Study is also available.

Rocky handed out the Segment I – Final Report on the Corsica Lake/Lewis & Clark Lake Watershed Improvement Project ([attached](#)).

Rocky said the report is “warm and fuzzy” but Congress is not happy with any project results because pollution is still a problem. There is a bill in Congress concerning the Chesapeake Bay Hypoxia problem. This bill could possibly include all watershed projects. There is a big meeting coming up in Pierre with DENR and Washington, DC, representatives. Rocky participated in a Webcast that discussed EPA and USDA funds. In the future funds may be expended via a 3-Tier system based on the distance from a receiving water body. SD DENR has identified 29,000 East River feedlots. 17,000 feedlots are in Tier #1 (¼ mile or less to water). These would get 90% cost share, Tier #2 = 60% cost share (¼ to ½ mile from water), and Tier #3 = 30% cost share (1/2 mile and greater). USDA and 319 dollars may be spent according to the 3-Tier system. The landowners will have to follow USDA regulations to get the Farm Program funds from FSA, NRCS, etc. Rocky and Wacey will be conducting water testing/monitoring this spring. Segment II Project grant includes completing 12 feedlots among the other non-feedlot practices;

Les updated the group on the Randall Creek Watershed sediment problem. One more interagency meeting will take place followed by a landowner meeting. RAM could possibly help with this watershed. Watershed landowners have to want and request assistance for any special help.

Rocky said he and Wacey will have a booth at the Mid-Winter Fairs in Todd and Tripp counties.

Needs/Opportunities: We went around the table for comments from everyone and comments were generally favorable about the project. Comments follow:

- It was discussed that more I&E should be done to show how the project is doing good things and making a difference.
- Discussion about the RAM program and using it in the L&CWIP. We will most likely need to wait and include it in the next grant application (Sept. of 2010). We will check on this.
- RAM in Firesteel Ck has some bugs in it. Hard sell to Landowners, lots to fence out, payments get less further from the creek
- SCWDD is very supportive of the Project
- More promotion of project. CD business is slow and pass things on to Districts where there is a possibility of making money
- Would like to see Rocky more often
- Solve engineering support problem, Grazing Sustainability Initiative could help

A pizza and chicken lunch was provided by Randall RC&D.

Conservation and Wildlife Habitat Workshop
Lake Andes 4-H Center
Monday March 15, 2010
1:00 PM -3:00 PM
Draft Agenda

Introductions	5 minutes	Les Labahn, Randall RC&D Vice Chairman
History & Current Status of Lewis and Clark and Lake Andes Watershed Funding	10 minutes	Jeff Stewart, Randall RC&D
Lewis and Clark Segment I Report And Lake Andes Watershed Phase I Assessment Final Report	15 minutes	Rocky Knippling, SDACD
Charles Mix County Lake Restoration Organization	10 minutes	Darryl Deurmier, President
USF&WS Involvement	10 minutes	Mike Bryant, Lake Andes Wildlife Refuge Manager
Break	5 minutes	
USDA Programs and Incentives	15 minutes	George Sherrard, NRCS District Conservationist & Joe Schultz, FSA County Executive Director Charles Mix County
L&CWIP Assistance	10 minutes	Rocky Knippling
Charles Mix Conservation District Assistance	10 minutes	Nick Stotz
Pheasants Forever	10 minutes	Jim Risteau
Game Fish and Parks Programs & Incentives	10 minutes	Brent Nye
Questions from Attendees	10 minutes	Speakers



NEWS RELEASE

United States Department of Agriculture • Natural Resources Conservation Service
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NEWS For Immediate Release

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Conservation and Wildlife Habitat Workshop

1:00 PM to 3:00 PM

Monday March 15, 2010

4-H Building in Lake Andes

100 School St or N. end of 3rd Avenue

A consortium of conservation agencies and organizations have come together to offer landowners and the interested public, the latest information on programs and incentives dealing with land water conservation and wildlife habitat management. Randall RC&D and the Charles Mix Conservation District are sponsoring the 2 hour workshop.

Short presentations will be given from **1 to 3 pm** by personnel from the NRCS, USF&WS, Pheasants Forever, SD GF&P's, FSA, Randall RC&D, the Charles Mix County Lake Restoration Organization and the Charles Mix Conservation District. All will be available to answer questions.

Recent additions to the Lewis and Clark Watershed Implementation Project (L&CWIP) have resulted in additional landowners eligible for cost share dollars and incentives under the Randall RC&D administered L&CWIP. There are also a number of new initiatives and opportunities being offered by the NRCS and other agencies.

The Charles Mix County Lake Restoration Organization will also give a short update on the progress being made on restoring Lake Andes Lake.

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NRCS NEWS RELEASE

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NEWSRELEASE

Randall RC&D Hosts Conservation and Wildlife Habitat Workshop

Landowners and other conservation minded individuals were updated by specialists from nine conservation and wildlife management agencies and organizations on March 15 at the Lake Andes 4-H building. Over 20 people attended the 2 hour event and heard the latest information on what's happening in our watersheds and on our land.

There are just a myriad of programs and opportunities for landowners and operators in our area due to a number of watershed projects, local efforts, and state and federal programs. To name but a few, the Charles Mix Conservation District talked about the attractive incentives for landowners to establish living snow fences. The Charles Mix County Lake Restoration Organization talked briefly about their recent efforts in restoring the south end of Lake Andes called the Park Avenue Project. Through a volunteer program they are also doing monthly water quality testing of the lake to get a handle on long term changes to the lake water. The 95,000 acre Lake Andes Watershed was recently added to the Lewis and Clark Watershed Implementation Project. This watershed project is administered by Randall RC&D in cooperation with the local Conservation Districts and brings in new and additional money for non-point source pollution control. The watershed project assists and accelerates the existing technical assistance and program cost share dollars on certain conservation practices shown to reduce sediment and improve water quality in these watersheds.

Landowners also learned about how the agencies and organizations know about each others programs and how they work together to eliminate any duplication.

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Lewis and Clark Watershed Implementation Project Protecting a National Resource Today

Fact Sheet

Starting in 1930's with the first dam, the six dams on the Missouri River now provide:

- Quality drinking water
- Hydropower
- Recreation
- Navigation
- Water for irrigation
- Flood control
- Fish and Wildlife habitat
- Endangered Species and Cultural Resource Protection

Current Situation: Dams are filling with sediment Reaction vs. Action

Reaction

- Elevation or moving of roads
- Moving drinking water intakes
- Establish new/longer boat launch pad
- Buy-out of homes



Action

In 2002 meetings were held as local organizations and citizens were concerned about sediment in Lewis and Clark Lake. Assistance was requested from Randall and Lower James RC

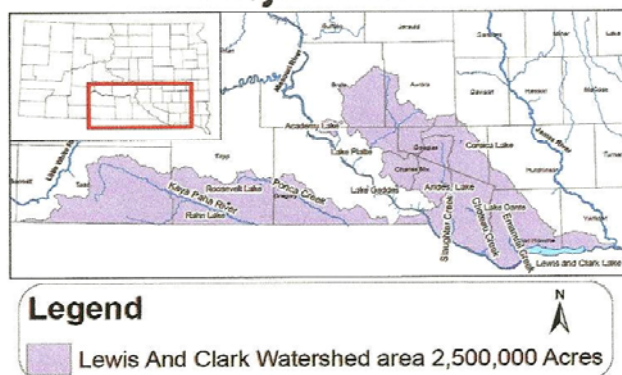
- 2003 to 2005: Randall RC&D administered a watershed assessment project with the help of Lower South Central Water Development District (SCWDD), local Conservation Districts and the SD Department of Environment and Natural Resources. This led to the chronology of implementation efforts below
- July 2006: Starting at the top of the Lewis and Clark Watershed, a two-year **56,300 acre** Corsica project was initiated with \$300,000 federal Section 319 Clean Water Act funds. Local cash and in-kind from Conservation Districts and landowners.
- With the help of the **South Dakota Partnership** (DENR, SCWDD, Douglas County Conservation Association of Conservation Districts, NRCS and others) this project successfully surpassed assigned acreage and goals. Most of the project money was combined with USDA CRP and EQIP for the project.
- In July of 2007 the project was expanded from 56,300 acres to **747,000 acres** and included the entire side of the Lewis and Clark Watershed. \$514,000 of EPA money and \$130,000 from the SD Board of Natural Resources money was added to the project.
- In March of 2008 the watershed acreage in the west river counties of Gregory, Tripp and Todd was added to the project with no additional money bringing the project work area to 1.9 million acres. Seven east and three west river counties and eleven Conservation Districts are now involved with Project Implementation.

- Also in 2008 the **95,000 acre** contiguous Lake Andes Watershed was added as an amendment to the project. The same program neutral non-point source pollution control tasks will be undertaken plus monthly lake water testing by citizen volunteers.
- Addition of Academy Lake, Platte Lake and Geddes Lake increased the total project to 2.5 million acre

LCWIP 2011 Milestones – Best Management Practices (BMPs) Completed

<u>BMP</u>	<u>Sum of BMPS</u>	<u>Units</u>
Ag Waste System	39	Engineering -
Ag Waste System	44	Nutrient Management Plans
Ag Waste System	3	Riparian Winter Feeding Area
Ag Waste System	32	Waste Management System - 312
Critical Area Planting	14028.2	ac
Critical Area Planting	18023.1	ac Cropland BMPs
Critical Area Planting	4301.1	ac Filter Strips
Critical Area Planting	65.9	ac Grassed Waterways
Grazing Management	358	ac Grass seeding
Grazing Management	5744.4	ac Grazing Systems
Grazing Management	98.4	ac Pasture/Grassland Buffers
Grazing Management	7201.1	ac planned grazing systems
Grazing Management	87547	ft River excluded
Grazing Management	62876	LF Fencing
Grazing Management	84413	LF Pipelines
Grazing Management	3	Ponds/dugouts
Grazing Management	2	Rural Water Hookup
Grazing Management	41	Tanks

Lewis and Clark Implementation Project Area



Project in 2012 includes parts of 11 counties.

This Watershed project is administered by the Randall RC&D Association, Incorporated. Major implementation funding is provided through a Clean Water Act Section 319 Grant.

All programs and services of the Randall RC&D are offered on a non-discrimination basis.