CLEAN WATER ACT SECTION 319

NONPOINT SOURCE CONTROL PROGRAM

FINAL REPORT

GRASSLANDS MANAGEMENT AND PLANNING PROJECT

SEGMENT 4

SPONSOR:

SOUTH DAKOTA GRASSLANDS COALTION

PROJECT COORDINATOR:

JUSTIN JESSOP

January 2018

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

Grants C9-99818513 and C9-99818515

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EXECUTIVE SUMMARY

Project Title:	Grasslands Management and Planning Project – Segment 4		
Grants:	C9-99818513 and C9-9818515		
Project Start Date:	July 11, 2013	Project Completion Date:	July 31, 2017

Funding:	Total Project Budget		$1,290,404.49
	Section 319 Grants	998185-13	201,000.00
	Amendment	998185-15	179,000.00
	Total Section 319 Grants		$380,000.00
	Total Expenditures of EPA Funds		$356,219.95
	Total Section 319 Match Accrued		$801,729.63
	[CWSRF-State Funds	Part of Match	$214,734.06]
	Other Federal		$ 132,454.91
	Total Expenditures		$1,290,404.49

The project was the fourth segment of the Grasslands Management and Planning Project –Segment 4, by the South Dakota Grasslands Coalition to improve water quality and wildlife habitat, increase biodiversity and maximize economic sustainability**.** The project goal was to reduce sediment, nutrient and fecal coliform bacteria loading to surface waters in South Dakota by improving range condition.

The Coalition continued its partnership with grassland managers, grassland and livestock organizations, and local, state, and federal agencies formed partnerships to implement a strategy developed during previous project segments to design, implement, and monitor "management intensive" grazing systems that would lead to attain the project goal.
The partners established three objectives to continue progress toward attaining the goal:

1. Provide grassland managers with the technical assistance needed to plan 256,000 acres of managed grazing systems, and complete the implementation of systems on an additional 192,000 acres of grasslands.

2. Transfer grassland management information to a minimum of 20,000 South Dakota producers, 40 researchers, 80 grassland specialists, and the 380,000 members of the public.
3. Monitor and evaluate project progress toward the attaining the project goal realized by implementing the practices selected to reach the objectives established for this project segment.

During the Project period, the budget and workplan was amended five times. The amendments were made to better make use of match provided by project partners and to extend the project end date. As project partners developed grazing plans during this project segment, they continued to select practices to help the grazing system operator to increase profits while improving the ecological status of the grasslands, improving water quality and providing habitat for a healthy, more diverse wildlife population. Partners promoted the concept that managed grazing is a practice which leads to improved soil health through project outreach and information transfer activities.

Segment 4 outreach and information transfer activities provided more than 2,240,000 individuals with the opportunities to learn about the project and the environmental and economic benefits of managed grazing. Five grazing schools, 27 tours, and 21 workshops were held. Fifty-two news articles were in publications reaching more than 1,250,000 readers.

The number increases the cumulative total for all project segments to slightly more than 7.7 million since 2001. The totals include estimated booth traffic at events such as conferences and trade shows, attendance at field days, workshops, and meetings; circulation of periodicals and radio station market share. Working relationships with nature and environmental groups or members of groups such as the South Dakota Ornithologist Union, Ducks Unlimited and the Sand County Foundation continued.

Since 2010 the Sand County Foundation has partnered with the Coalition, South Dakota Cattlemen's Association, SD Discovery Center and Aquarium and other partners to sponsor the Leopold Conservation Award in South Dakota. The award recognizes leadership in voluntary conservation and ethical land management. The award recognizes the accomplishments of farm/ranch families in each of the 11 participating states as each year and showcases conservation programs as viable tools for developing and operating agricultural operations that provide all residents with economic and environmental benefits.

Grazing management practices have been shown to reduce nitrogen, phosphorus and sediment from entering waterways. Improvements in grazing practices resulted in the following nonpoint source reductions to waterbodies using the STEPL model. Acres with a grazing plan written by Grassland Coalition or partners were modeled assuming a change from fair to good condition during Segment 4. Load reductions for Segment 4 of the project are as follows:

Nitrogen (lbs)	183,810
Phosphorous (lbs)	38,555
Sediment (tons)	19,858

INTRODUCTION

The Grasslands Management and Planning Project was developed to continue the implementation of grazing management practices that reduce NPS by improving range condition initiated during 2001 by the Grazing Management & Planning Project. Segment 4 of the current project was funded in part by Environmental Protection Agency (EPA) Clean Water Act Section 319 Project Grant numbers C9-99818513 and C9-99818515 awarded through the South Dakota Department of Environment and Natural Resources (DENR).

According to the National Agricultural Statistics Service (NASS) the number of farms and ranches in the state decreased from 33,191 in 1997 to 31,989 in 2012. NASS data indicates that the number of beef cattle in the state decreased by approximately 51,600 head (1,662,162 to 1,610,559) during the same time period. Pasturelands decreased from 24,448,108 acres in 2007 to 23,244,522 acres in 2012. Rangelands are classified into ecological sites based on soils, topography, and climate that make up their unique characteristics. Each site has a characteristic plant community that has developed on the site according to these factors. Range specialists refer to this as the reference or "Historic Climax Plant Community." Deviations from this "reference" condition are indicated by the similarity index class with 0 showing zero percent of reference class condition (poor condition) and 100 showing alignment with the reference class condition(excellent condition).

The first accurately collected statewide data from Natural Resources Conservation Service's (NRCS) National Resource Inventory (NRI) was in 2003-2004, and below are the numbers from those two years combined:

Similarity Index Class:	Poor	Fair	Good	Excellent
	0-25%	25-50%	50-75%	75-100%
	=====	======	======	=======
	34.9%	33.0%	24.8%	7.3%

While data collection has continued, a wholesale re-evaluation of condition class due to management practices on these ranches has not occurred. Based on information provided by resource inventories and follow-up activities with producers who installed grazing systems, it is estimated using professional judgement from NRCS personnel that the practices installed resulted in 75 percent of a participant's grasslands being improved by one similarity index class when managed grazing is applied.

The Grassland Management and Planning Project is sponsored by the South Dakota Grasslands Coalition (SDGLC) in partnership with agricultural organizations, local, state, and federal

agencies and the academic community. Since the Coalition was formed in 1998, its principle project partners have included, among others, the:

- South Dakota Association of Conservation Districts (SDACD),
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS),
- South Dakota State University (SDSU),
- South Dakota Department of Game, Fish & Parks (GF&P),
- United States Department of Interior-Fish and Wildlife Service (USFWS)-South Dakota Partners for Fish and Wildlife (US FWS),
- South Dakota Discovery Center and Aquarium
- SD Department of Environment and Natural Resources
- SD Farm Bureau
- World Wildlife Fund

The project partners contributed financial and/or technical assistance that generated the synergy which resulted in project acceptance by a wide range of interests and the level of success achieved. A complete list of project partners and their contributions to project success is located in coordination section of this report. SDGLC is part of the Natural Resources Conservation Service's Grazing Lands Conservation Initiative (GLCI). The initiative is a nationwide effort designed to provide technical assistance to private grazing land operators and increase the awareness of the importance of grazing land resources. For additional information about the SDGLC visit:

http://www.sdgrass.org/

During completion of the projects, referred to as project Segments 1- 4, SDGLC and its project partners installed or were responsible for the installation of grazing management practices on nearly 910,000 acres. This reduced nitrogen entering South Dakota's lakes and streams by more than 788,226 pounds and reduced phosphorous by 148,523 pounds and sediment by 88,721 tons.

Conservation practices used to install the grazing systems included:

- water development – wells, pipeline tanks, pasture pumps and dams and dugouts
- fence - cross, perimeter and riparian exclusion
- managed /rotational grazing
- stream crossings and
- grass seeding

Information and education (I&E) outreach activities completed during Segments 1-3 provided managed grazing information and opportunities to more than 4.5 million people who attended project sponsored grazing schools (14) and management workshops and tours (53), or were provided information using print and electronic media releases and feature articles (105) with total circulation/listeners = nearly 4.15 million). Segment 4 was designed to continue the implementation of NPS reduction BMPs on grasslands. During the completion of Segment 4, the SDGLC and its project partners provided:

- 124 livestock producers who manage nearly 496,317 acres of South Dakota grasslands with the assistance needed to design and install grazing systems ranging in size from 30 to more than 31,500 acres
- 2,240,000 individuals with opportunities to learn about the project and the environmental and economic benefits of managed grazing.

More detailed information regarding the accomplishments listed above is provided in the Project Goals, Objectives, and Activities section of this report.

During Segment 4, producers requesting assistance had grazing lands were rated in the fair, good and excellent ecological categories while those with lands rated as poor were less likely to participate. The Grasslands Coalition maintained working relationships with nature and environmental groups or members of groups such as the South Dakota Ornithologist Union, Sand County Foundation, North Dakota and Nebraska Grazing Lands Coalitions, World Wildlife Fund and National Fish and Wildlife Foundation. These alliances have generated support of managed grazing as not only a water quality best management practice (BMP) that has a positive impact for producers installing the practice, but also a practice that promotes preservation of grasslands and therefore habitat for game and non-game species of animals and the preservation of native vegetation. It is suggested that this support may be a critical factor in generating support for programs that will slow the conversion of grassland to croplands that is taking place in the Prairie Pothole Region. Central SD is an area where the rate of conversion is especially high.

During 2010, because of the SDGLC's demonstrated success with the implementation of grassland conservation practices, the Sand County Foundation partnered with the South Dakota Grasslands Coalition and the South Dakota Cattlemen's Association to serve as the sponsors for the Leopold Conservation Award in South Dakota. The Sand County Foundation offers the award in 11 states through partnerships with individuals, organizations and agencies. The award recognizes leadership (in voluntary conservation and ethical land management. Information regarding the award is available by accessing the sites listed below:

https://sandcountyfoundation.org/our-work/leopold-conservation-award-program

State recipients receive a Leopold Crystal, farm/ranch sign and a $10,000 cash award. Information about the South Dakota winners is located on page 23.

During the project period, the implementation plan was amended five times. The actions authorized by the amendments are summarized below.

- provided for procuring the services of a of contract writer to prepare newsletter stories, provide travel funds and funding for an information specialist
- corrected an oversight in the budget as some funding originally identified did not materialize
- eliminated the use of USDA Farm Bill Dollars for activities and decreased the Information & Education portion of the budget to provide additional funds for the range consultant line item
- extended the project period through July 31, 2017 and
- increased the amount budgeted for the project coordinator so that services would be available through the extended project period. The reductions made to accommodate the increase were to SDSU outreach, Administration, Liability, Postage, Computer Maintenance, Vehicle expenses, Information & Education, Supplies and Reporting line items

A descriptive summary of the activities completed during project Segment 4 to achieve the results summarized above, a comparison of planned versus accomplished milestones and an evaluation of the accomplishments in relation to attaining the project goal is provided in the report sections that follow.

PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

South Dakota Grasslands Management and Planning Project Segment 4 was initiated July 11, 2013. Originally slated for completion in two years, the project period was extended through July 31, 2017. The goal of the Project is:

> Reduce sediment, nutrient and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition.

Three objectives for project Segment 4 were established to continue progress toward attaining the goal. These were:

1. Provide grassland managers with the technical assistance needed to plan 256,000 acres of managed grazing systems, and complete the implementation of systems on an additional 192,000 acres of grasslands.
2. Transfer grassland management information to a minimum of 20,000 South Dakota producers, 40 researchers, 80 grassland specialists, and 380,000 members of the public.
3. Monitor and evaluate project progress toward the attaining the project goal realized by implementing the practices selected to reach the objectives established for this project segment.

Objective 1: Provide grassland managers with the technical assistance needed to plan 256,000 acres of managed grazing systems, and complete the implementation of systems on an additional 192,000 grasslands.

Task 1: Provide livestock producers with the technical assistance needed to plan and operate grazing systems.

Product 1: Grazing management plans on 256,000 grassland acres.
One hundred twenty-four producers who manage 496,317 acres have completed plans and are in various stages of implementation. Project funded personnel completed 57 plans on 76,678 acres. Project partners completed 67 plans on 390,885 acres.

The systems planned during Segment 4 increased the number of:

- counties in which designs were completed from 19 to 26
- plans developed by project staff and partners increased from 209 to 333 and
- acres from which plans were developed by staff and partners from 774,000 to 1.6 million over all segments of the Grassland Planning and Improvement Project

The planning process:

- begins with a resource inventory of the land that will be included in the system and determination of the producer's management philosophy and capabilities
- uses practice Prescribed Grazing – Practice Code 528 outlined in the *NRCS National Planning Procedures Handbook, National Range and Pasture Handbook, and the South Dakota Field Office Technical Guide*
- includes development of alternative water sources to facilitate excluding grazing in riparian area and
- considers rural water hook up as the preferred alternative water source

See Product 2 for the practices included in the plans developed.

Both of the NRCS publications referenced are available by accessing: the following web site:

http://www.nrcs.usda.gov/technical/efotg/.

Project partners providing planning assistance include USFWS and NRCS. The planning accomplished by USFWS was possible through a National Fish and Wildlife Foundation (NFWF) grant to the SD Grassland Coalition. NRCS planned acres were accomplished by district, area and state resource specialists using the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP) and Grasslands Reserve Program (GRP). The number of producers and acres managed are listed by program were:

- NFWF - 17 producers, 31,754 acres
- EQIP - 39 producers, 353,122 acres
- WHIP – 9 producers, 37,280 acres
- GRP – 2 producers, 483 acres
- Grasslands Coalition – 57 producers, 73,678 acres

Criteria used to select the source(s) of funds to be accessed to install the grazing systems included:

- "fit-to-program"
- availability in a timely manner
- the operator's preference, and
- compatibility of the program to system manager's operation

The increased reliance of planning services provided by project partners during Segment 4 allowed project staff to concentrate efforts more on outreach and education activities which in turn generated interest in implementing managed grazing practices. Nearly 60 percent (210,000) of the acres attributed to EQIP were from three operations in the western part of the state.

The systems planned ranged in size from 100 acres to 90,000 acres with the average size being in the 1,300 to 5,800 acre range when the three operations referenced above are not considered in the averages. The smaller operations tended to be more in the central to eastern portions of the state with the larger in the west. The averages reflect the operation size difference from east to west as annual precipitation decreases. An example of a grazing plan developed is shown in Figure 1. The system is divided into 10 paddocks using cross fence. Water was supplied using a pipeline and three tanks with each tank positioned to serve multiple paddocks.

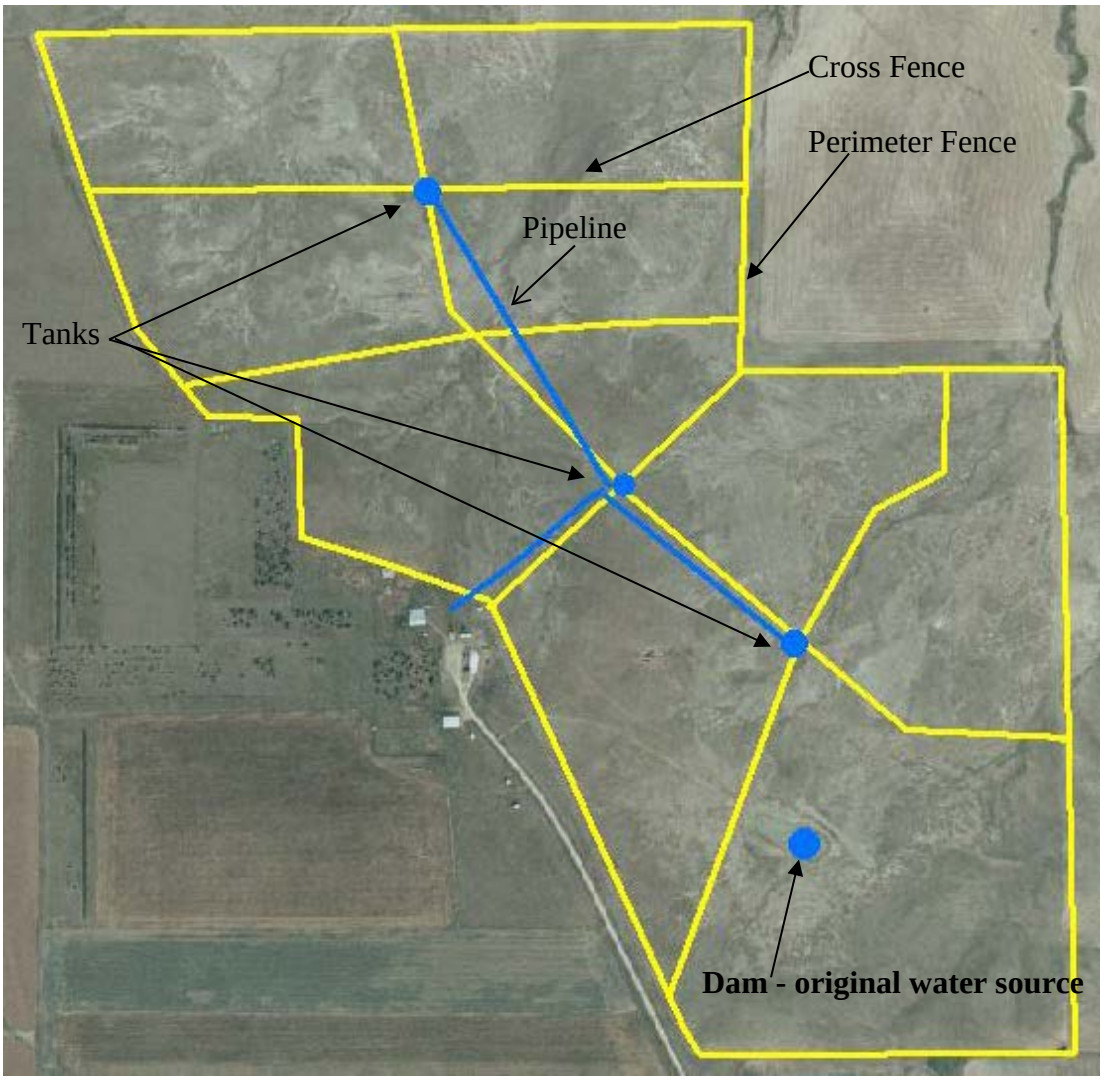

Figure 1. Managed grazing system design.

Grassland managers who are receiving technical assistance are provided with a copy of *Grassland Plants of South Dakota and the Northern Plains*. The book is intended to assist them in their inventory and monitoring activities. The book is also provided to grazing school students, FFA and 4-H chapters. Over 1,600 *Grassland Plants of South Dakota and the Northern Plains* books were purchased through the NRCS contribution agreement during Segment 4.

A grazing stick is a specially designed yardstick with formulas, tips and guidelines printed on the sticks four sides to help manage forage production relative to animal units using the pasture or paddock (Figure 2). Training regarding how to use the stick is always provided prior to distribution. Training occurs at events such as the grazing school (Figure 3) and pasture walks.

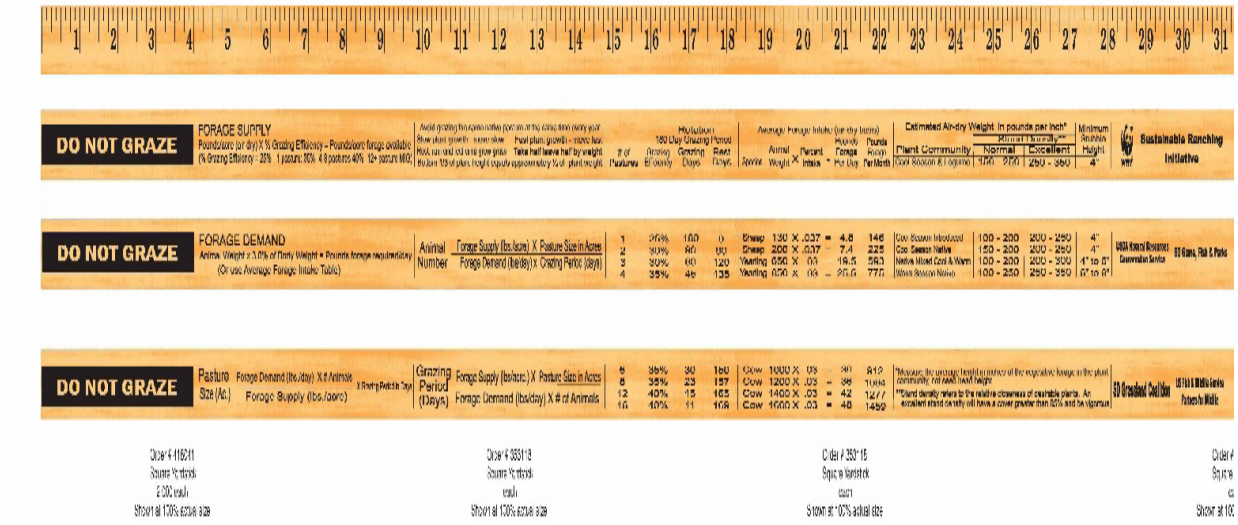

Figure 2. Information on each side of the grazing stick

Figure 3. Attendees at the SD Grazing School learn to use a grazing stick.

Product 2: Install grassland management systems on 192,000 acres.

During the project period 471,434 acres of managed grazing systems were installed using assistance provided by project staff and its partners. The total includes 223,434 acres assisted by the project staff and 248,000 acres by project partners. The locations of the 51 systems installed during Segment 4 appear in Figure 4. The graphic also shows the location of systems installed during previous project segments and the relationship to active 319 project areas.

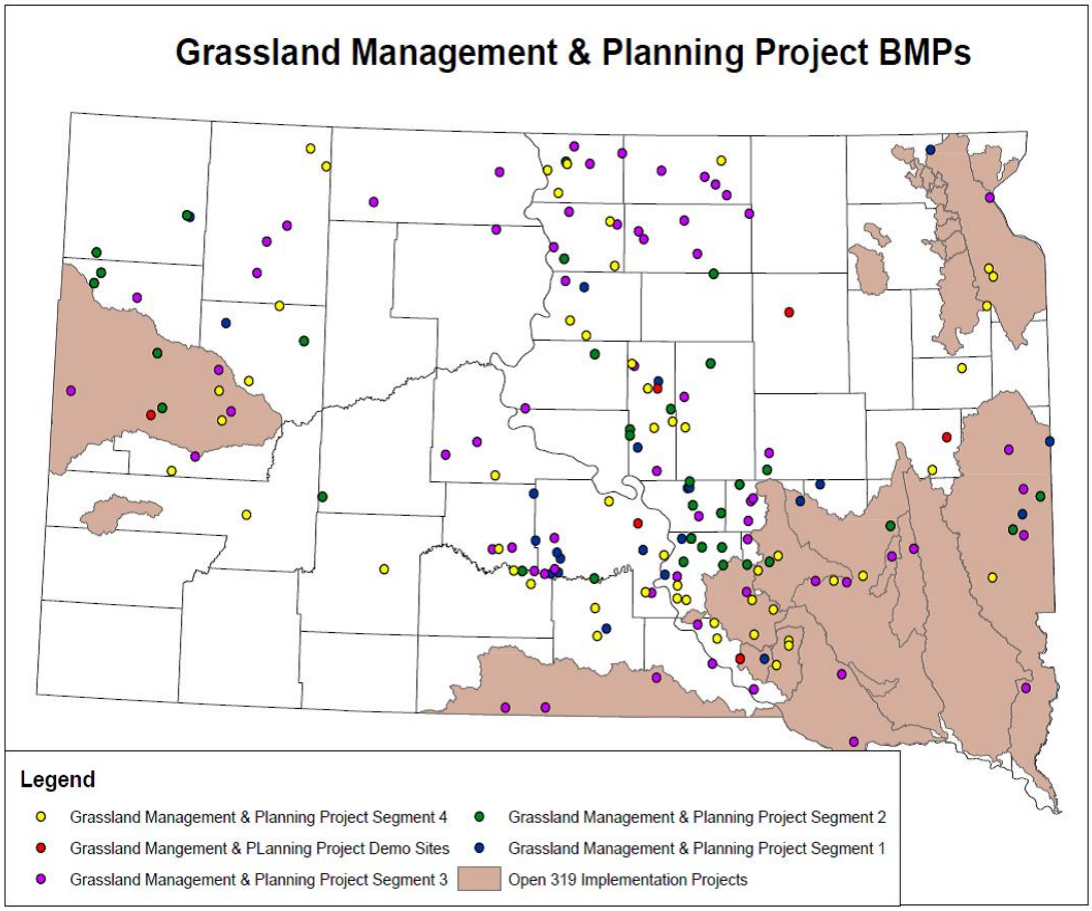

Figure 4. Locations of managed grazing systems installed.

Of the 51 systems, 17 were located in active 319 project areas. Nearly half of the systems are in the central area of the state which has experienced recent cropland conversion. This suggests that even though this area has experienced significant grassland loss, livestock producers who remain are among the most active in installing managed grazing systems as a strategy to maintain profitability.

Assistance to 20 of the producers was provided using funds from a National Fish and Wildlife Foundation Grant during Segment 4. During 2015, the SDGLC was a recipient of a National Fish and Wildlife Foundation Grant, 'Enhancing Rangeland Ecology by Improving Ranch Management Options in South Dakota (Phase I)' to improve grassland management through improved grazing management, with a primary goal of improving overall habitat for all associated species, especially grassland birds.

Seventeen landowners managing 31,618 grassland acres and 136 wetland acres received financial and technical assistance through the Phase I grant. In addition, the 17 participating landowners signed formal 10-year Landowner Agreements specifying the long-term

management plans and goals for each tract of land. Primary partners were the US Fish and Wildlife Service's Partners for Fish and Wildlife Program and the South Dakota Department of Game, Fish, and Parks' Private Lands program.

During 2017, a second grant from NFWF (Phase II) to continue the activities initiated during 2015. Three producers received assistance during project Segment 4. Primary area of focus continued to be western South Dakota, but will included some “fringe” counties in close proximity of the Missouri River. Phase II provided funding to assist 14 private landowners improve habitat on a minimum 12,100 acres through long-term conservation agreements and included habitat improvement techniques such as fencing (9.5 miles) and water development for prescribed/ecological grazing as well as grassland/wetland restoration (340 acres).

Technical and financial assistance to install the practices selected to construct the systems (Table 1).

Technical assistance was provided by:

- NRCS
- SD GF&P
- US FWS, and
- Local conservation districts

Financial assistance was provided by local, state and federal organizations and agencies which included:

- US Fish and Wildlife Service (USFWS) South Dakota Partners for Fish and Wildlife using the North American Wetlands Conservation Act Grants (NAWCA)
- NRCS - EQIP
- South Dakota Game, Fish and Parks (GFP) – SD GF&P Private Lands Habitat program
- SD Conservation Commission – Soil and Water Conservation Fund and
- DENR – Section 319 TMDL Implementation Project Grants

Table 1. Conservation practices used to install grazing systems

Practice	Milestone	
[redacted]	Planned	Achieved
Cross & Exclusion Fence (feet)	240,000	284,375

Pipeline (feet)	250,000	367,292
Rural Water Hook-ups	2	0
Tanks	80	134
Dugouts/Dams	12	0
Stream Crossing	2	1
Grass Seeding (acres)	1,500	1019
Well	8	7

Fencing installed include single wire, three wire, high tensile electric or poly wire. Three wire was most often used for an exterior fence; single wire for cross fence within a system. Grass seeding was used to convert cropland to native vegetation. Occasionally a producer included a non-native species such as alfalfa in the seed mixture planted to provide greater forage value in the event a paddock was harvested for hay. One stream crossing was installed as it was determined to be necessary at the location to provide water access.

Options to supply water to a grazing system included rural water systems, wells and dams/dugouts. Rural water was the method of choice when available. Rural water is a reliable source of water which promotes improved herd health, reduces incidence of livestock entering surface water bodies, and provides consistent, positive environmental and economic benefits. Some rural water system are at or nearing capacity to supply. Producers need to be aware of the limitations of their respective rural water system during their design process. They may need to add storage tanks if the pressure and flow of the system will not supply their herd needs. For example, a producer whose grazing system was located at the end of delivery line installed a storage tank to store meet peak demand periods for his livestock. The source of water to a grazing system was the determining factor relative “delivery” to the livestock within the system. When wells and rural water were the source, pipeline delivered the water to tanks. One hundred thirty-four tanks were installed within the systems during project Segment 4.

Pipeline installed included both above and below ground (buried). While the project does not sell pipe, project staff assisted producers with placing orders for the one inch above ground polyethylene pipe (Figure 5). The pipe is relatively inexpensive, lightweight, and flexible and affords the system manager advantages over installing buried pipe. Using above ground pipe, producers are able to supply water to paddocks to pasture subdivisions at a lower cost than when using buried pipe. In addition, the portability of above ground pipe allows the producer to try water placement in an area before making the decision to put in a permanent system. Using easy to install quick couplers (Figure 5) to tap the above ground pipe allows grass managers a source

of water wherever they determine a tank should be placed. Once the key is inserted into the riser, water is free flowing.

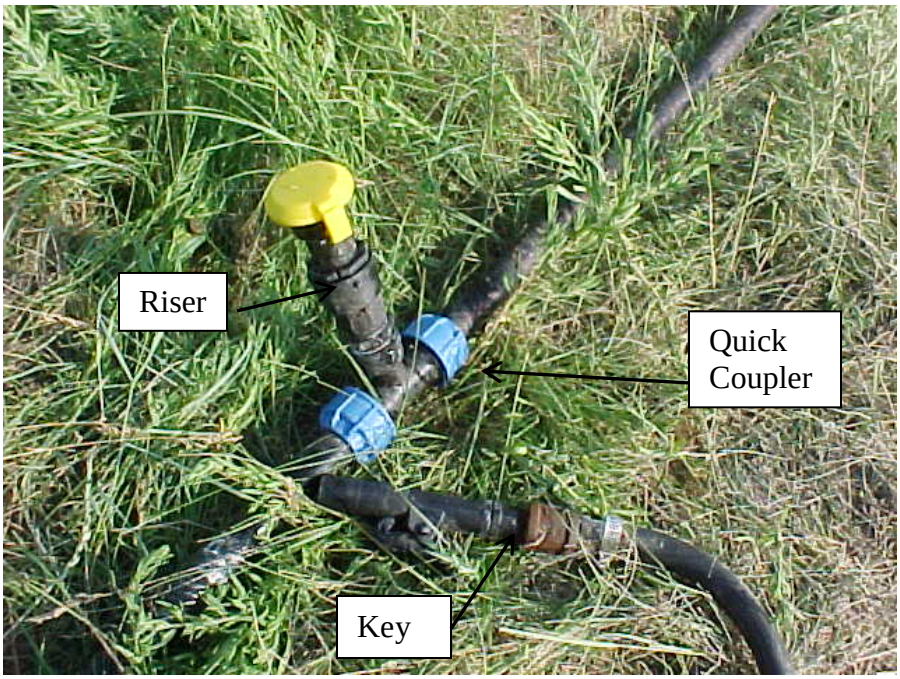

Figure 5. Aboveground pipe with coupler, riser and key.

Load reductions realized from the systems 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 annual reports prepared using the format provided by DENR to facilitate entry into EPA's Grants Reporting and Tracking System (GRTS).

NPS pollution load reductions to SD lakes and streams realized from grazing systems installed during project Segment 4 is listed in Table 2.

Table 2. NPS Load Reductions based on grazing systems installed.

Pollutant	Load Reduction
Nitrogen (lbs)	183,810
Phosphorus (lbs)	38,555
Sediment (tons)	19,858

Objective 2: Transfer information on grassland information in South Dakota to 20,000 producers, 40 researchers, 80 grassland specialists, and approximately 380,000 other individuals.

Task 2: Complete information and outreach activities that promote and provide opportunities for involvement in grassland management and bring about an awareness of the water quality impact(s) of improved grassland management targeted towards 319 TMDL implementation project areas, riparian areas, and grasslands in southeast South Dakota.

Product 3: Existing website maintenance, farmer/rancher workshops, Grazing Schools, News Releases and Summer Grazing tours.

The project coordinator working in partnership with SDSU Range Science and NRCS outreach and public affairs persons and conservation district personnel continued to provide livestock producers, resource managers, the research community, students, and the general public with opportunities to learn about grassland management. The SD Grasslands Coalition lists upcoming events and activities on their website and a Facebook page. URLs for the sites follow:

http://www.sdgrass.org/
https://www.facebook.com/SouthDakotaGrasslandCoalition

The activities provided opportunities to learn about the project and the environmental and economic benefits of managed grazing to more than 2.3 million during this project segment and more than 8.4 million since the project were initiated during 2001. The total includes estimated booth traffic at events such as conferences, and trade shows, attendance at field days, workshops, and meetings; circulation of periodicals, radio station market size, website hits and tweets. Milestone comparisons of planned versus accomplished outreach activities for project Segment 4 and cumulative for all project segments are summarized in Table 3.

Table 3. Information transfer - educational outreach activities milestone comparison

Activity	Project Segment 4			Cumulative		
	Planned	Completed	Individuals Reached	Planned	Completed	Individuals Reached
Grassland Birding Tours	4	4	246	4	11	673
Grazing Schools	4	5	154	11	18	502
Leopold Award Tours	4	4	300	3	7	892
Meetings & Workshops	12	29	1,410	29	80	4,681
News Releases- print articles about project related activities	8	52	2,241,865	181	176	7,786,272
Web Site	1	1	111,000	1	1	451,655
Totals			2,354,975			8,244,675

The information transfer and involvement opportunities were, for the most part, a continuation of activities initiated during previous project segments and build on previous successes. Therefore, the summary of accomplishments/outcomes that follows is limited to a brief description and highlights of transfer and involvement opportunities provide during this project segment, with cumulative information regard all project segments. For a more descriptive summary regarding involvement opportunities visit:

www.sdgrass.org
https://www.facebook.com/SouthDakotaGrasslandCoalition
http://www.sdconservation.org/grassland/managing/gmd/index.html
http://denr.sd.gov/dfta/wp/wqinfo.aspx#Project

The SDGLC had the following presenters at the 2013-2015 Winter Road Shows:

Table 4. 2013-2015 Winter Road Show presenters, locations & attendance.

Presenter	Year	Number of locations	Attendees
Jerry Doan & Gene Goven	2013	4	177
Gabe Brown	2014	3	191
Dave Pratt	2015	5	234
Total			602

Dr. Dwayne Beck presented at the 2016 Winter Road Show. Beck is the manager of Dakota Lakes Research Farm. The farm is a cooperative venture of SDSU and the agricultural producer members of the corporation. The primary goal of the farm, located near Pierre, SD, is to identify, research, and demonstrate methods of strengthening and stabilizing the agriculture economy. Dr. Beck discussed the importance of carbon compounds in the soil, mimicking natural systems with crop rotations, bale and swath grazing, and remote livestock monitoring (Figure 6).

Figure 6. Dwayne Beck present to the Belle Fourche, SD attendees.

Table 5. Locations and attendance at 2016 Winter Road Show.

Locations	Attendance
Belle Fourche	42
Winner	10
Watertown	39
Yankton	16
Chamberlain	83
Total Attendance	190

During January 2014, The SDGLC presented "The Other Side of Disaster"—a two-day seminar in Rapid City, SD by guest speaker, Dave Pratt. Pratt's programs, which include the Ranching for Profit School and Executive Link, have benefited thousands of families and millions of acres. He has researched management intensive grazing and strategic issues impacting the profitability of ranches and he is dedicated to helping people transform their farms and ranches into sustainable businesses. Pratt's presentation provided tools and tips, as well as encouragement, for producers who have experienced setbacks in production because of uncontrollable circumstances, such as October's winter storm Atlas. In addition to classroom time, attendees also had an opportunity to meet with Pratt for evening discussions. The event was open to all producers, but targeted those affected by the October 2013 blizzard. More than 160 people attended the event (Figure 7). Through sponsorships, the meals, breaks and learning materials were provided at no cost to the attendees.

Figure 7. Attendees at 'The Other Side of Disaster' event listen to Dave Pratt.

For more information on Pratt's Ranching for Profit school, SD Grasslands Coalition newsletter highlighting "The Other Side of Disaster" event, Pratt's comments about the workshop and Winter Storm Atlas click on the following links:

http://www.ranchmanagement.com/
http://www.sdgrass.org/wp-content/uploads/2017/10/april_2014.pdf
http://blog.ranchmanagement.com/getting-back-up/
https://www.weather.gov/unr/2013-10-03_05

The Washington Pavilion in Sioux Falls, SD, hosts an Ag Day event. For information about the pavilion's Ag Day event visit:

http://pavilionagday.org/

The coalition has been attending since 2008. During segment the project staff used the "plant-a-brand" activity from South Dakota Ag in the Classroom (Figures 8 and 9). Participants are to trace their "brand" on a construction paper with glue then sprinkle grass seed on the glue thus creating a "brand." Instructions for planting the grass and benefits of a healthy grass ecosystem are printed on the back of the card. This event allows agricultural groups show non-agricultural people practices agricultural producers can implement to enhance water quantity and water quality. See Table 6 for attendance figures during Segment 4.

Figure 8. An Ag Day attendees initials outlined with grass seed.

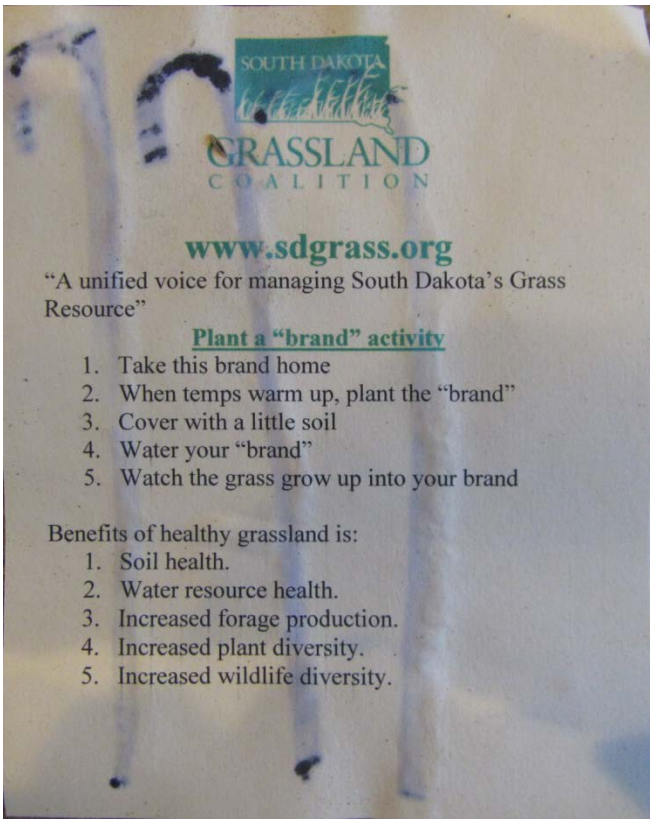

Figure 9. Back side of Plant-a-Brand.

During 2015 Washington Pavilion staff started an Ag Friday event geared towards third graders from Sioux Falls and the surrounding area.

An activity matching toy animals and grass was used at 2015, 2016 and 2017 Ag Friday events (Figures 10 and 11.)

Figure 10: Toy Animals and grass samples for the Ag Friday Event

Figure 11: Sandy Smart, SDSU Range Professor, interacts with third graders at the Washington Pavilion's Ag Friday.

Table 6. Ag Friday and Ag Day attendance figures.

Year	Ag Friday	Ag Fest
2014	na	1,582
2015	563	2,022
2016	557	2,200
2017	448	2,500
Totals	1,568	8,304

During April 2017, the SDGLC partnered with SDSU Extension, NRCS, and others to sponsor the Bugs N' Grubs Road Show (Figure 12). Bugs N' Grubs features a slate of speakers that share information on overall insect and parasite management on farms and ranches. Topics focused on five key areas including: holistic management and diversity, dung beetles, pasture grubs, pollinators, and livestock parasites. Importance of insect, plant, and animal diversity in grassland systems and how management decisions can drive systems away or toward health and profitability, and how indicator species, such as pollinating insects, can help a manager understand the direction they are headed.

Figure 12: Bugs & Grubs workshop attendees listen to a presenter

Table 7. Bugs & Grubs locations and attendance.

Locations	Attendance
Watertown	42
Oacoma	55
Rapid City	31
Total	128

Four bird tours (Figures 13 and 14) were hosted by the SDGLC in partnership with the SD Ornithological Union, SD Game Fish and Parks, US Fish and Wildlife Service and SDSU on working ranches during the project period. The first of the tours hosted during segment 4 was the 2014 tour near Union Center in the western part of the state. The 2015 tour was held near Marvin in the northeastern part of the state. The 2015 host ranch was on the former Blue Cloud Abbey property. The 2016 bird tour was held in central South Dakota near Ft. Pierre on the Bad River Ranch. The Bad River ranch encompasses more than 141,000 acres of private land. The ranch is one of the Ted Turner Buffalo ranches.

During 2017 the 11th annual Birds At Home on the Range Tour at the Dan and Sharon Anderson Ranch, Meadow, SD. The Andersons run sheep and cattle. Some of land they operate is part of the US Forest Service Grand River National Grasslands and Dan Anderson is on the board of the Grand River Grazing Association. This was the first time that the Grasslands Coalition Bird tour has been held on a sheep ranch. Forty five attendees observed 35 different bird species during the tour.

The brochure advertising the 2017 tour follows:

http://www.sdgrass.org/uploads/1/8/6/5/18654664/2017_bird_tour_brochure_4_26_17.pdf

Figure 13: Dan Anderson, 2017 bird tour host explains his grazing plan to tour attendees.

Figure 14: Bird tour participants observe prairie dogs near Anderson ranch.

Table 8. Bird Tour attendance by years and total attendance.

Year	Attendees
2014	45
2015	89
2016	67
2017	45
Total	246

During 2010, the SDGLC and the South Dakota Cattlemen's Association partnered with the Sand County Foundation to start the Leopold Conservation Award in South Dakota. The Leopold Conservation Award, named in honor of world-renowned conservationist Aldo Leopold, is comprised of a farm/ranch sign, a Leopold crystal and a $10,000 cash award. The award is presented annually in 11 states to private landowners who practice responsible land stewardship and management. For more information about the Leopold Conservation Award visit:

http://leopoldconservationaward.org/

The Blue Bell Ranch of Clear Lake, SD is the South Dakota recipient of the 2017 Leopold Conservation Award. Owned and managed by Herb and Beverly Hamann, along with their son

Breck Hamann and daughter Arla Poindexter and her husband Jay (Figure 15). The Blue Bell Ranch includes more than 5,000 acres of native grasslands and wetlands. The ranch is located on the southern end of the Prairie Coteau Hills in eastern South Dakota. A tour was held at the Blue Bell ranch during August 2017.

Figure 15: The Hamann family poses during filming of the Leopold Conservation Award.

South Dakota ranchers receiving the award and links to videos showcasing their operations follows:

2010 Doud Ranch, Midland, SD
http://www.youtube.com/watch?v=DX0G5LY5_Fo
2011 Mortenson Ranch, Hayes, SD
http://www.youtube.com/watch?v=9YsWjpD_SDo
2012 Kopriva Ranch, Raymond, SD
http://www.youtube.com/watch?v=z9cQSnAdcvc
2013 Guptill Ranch, Quinn, SD
http://www.youtube.com/watch?v=DGsjUdScWZM
2014 Rock Hills Ranch, Lowry, SD
https://www.youtube.com/watch?v=LmLc1ZHf65o&t=75s
2015 Jorgensen Land & Cattle, Ideal, SD
https://www.youtube.com/watch?v=W-re0Xc5ONY

2016 Cronin Farms, Gettysburg, SD
https://www.youtube.com/watch?v=t_0skcM0JMk
2017 Blue Bell Ranch, Clear Lake, SD
https://www.youtube.com/watch?v=YItULwuYaI8

During May 2015, The SD Cattlemen's Association, SD Association of Conservation Districts, SD No-Till Association, SDSU Extension, Natural Resources Conservation Service and the SD Grasslands Coalition formed the SD Soil Health Coalition. The coalition's mission is the promotion of soil health.
The Soil Health Coalition has a website and a Facebook page to promote their events and communicate with their members. URLs for both follow.

http://www.sdsoilhealth.org/
https://www.facebook.com/groups/1601091053504662/

The SD Soil Health Coalition held their first annual Soil Health School near Roscoe, SD, during 2016. The SD Grasslands Coalition assisted with the school. The SD Soil Health School used the SD Grazing School as a template for the Soil Health School and adapted including the Pasture Allocation Exercise to cover crops. The 2017 SD Soil Health School will be near Roscoe; the 2018 will be held near Salem in east central part of the state.

The Grazing School developed and held during project segment 1-3 continued. Agencies and organization involved with developing and hosting the South Dakota Grazing Schools during Segment 4 included representatives from several natural resource agencies and organizations. Among these were:

- SD Grasslands Coalition
- SDACD
- SDSU and the SD Cooperative Extension Service
- DENR
- SD Department of Agriculture
- SD GFP
- NRCS
- US Fish & Wildlife Service-South Dakota Partners for Fish & Wildlife.

The mission statement for the schools held during previous project segments was:

> "Give the grazing lands managers of South Dakota the tools to maintain healthy prosperous families, and diverse ecosystems, and profitable livestock operations while contributing to the well-being of communities."

During a strategic planning session held prior to the 2013 school, the grazing school committee adopted the following mission statement:

> "Provide land managers the means to measure, manage and add profit to all types of grazing land."

During the 2 ½ day Grazing school students attend classroom presentations such as: Adaptive Management and Mineral Needs of Livestock. The outdoor activities include the Pasture Allocation Exercise (Figure 16), Transect Reading and Soil Health and Water Infiltration using the NRCS Rainfall Simulator (Figure 17). A complete list of topics can be found on the grazing school brochure.

http://www.sdgrass.org/uploads/1/8/6/5/18654664/sdgc_grazing_school_brochure-generic-_school.pdf

The 2013 South Dakota Grazing School was held in the AmericInn in Chamberlain, SD, with the outdoor portion being held on South Dakota Game, Fish & Parks land north of Chamberlain. The Grazing School was held on Charlie Totton's ranch north of Chamberlain during 2014-2016. Totton has a registered Angus herd and is part of the Mob Grazing Study being conducted by SDSU range professor Sandy Smart. The 15th Annual and future South Dakota Grazing Schools will be held at the AmericInn in Chamberlain, SD with the outdoor portion being held at Totton Ranch.

Figure 16: Grazing School students build their fence for the pasture allocation exercises.

Figure 17: Grazing School students study water infiltration using SD NRCS's rainfall simulator.

Historic and current project segment attendance at the Grazing Schools held is shown in Table 6.

Table 9. Attendance at Grazing Schools.

School Number	Date	Attendance
1	September 2003	36
2	September 2004	28
3	September 2005	23
4	September 2006	18
5	September 2007	24
6	September 2008	26
7	September 2009	28
8 (2 schools)	September 2010	64
9 (2 schools)	September 2011	55
10 (2 schools)	September 2012	46
11	September 2013	25
12	September 2014	34
13	September 2015	33
14 (2 schools)	September 2016	62
Total		502

Objective 3: Monitor project activities and file reports as outlined in the project implementation plan

to determine compliance with grant and contractual agreements, memoranda of understandings, reporting requirements, and the SDGLC by-laws.

Task 4: Ensure all activities, reporting requirements, personnel actions and financial obligations associated with the project are completed, and terms of all agreements complied with as outlined in implementation plans, grant and contractual agreements, memoranda of understandings, any state and federal reporting requirements, and the Coalition's by-laws.

Product 4: Reporting and project management will be completed using a management agreement with the SD Association of Conservation Districts for project management and administration.

Four annual reports were submitted using the format provided by DENR.
This document completes the requirement for the final report for project Segment 4

MONITORING AND EVALUATION

Project monitoring will be completed by a team consisting of:

- the project coordinator
- grassland managers/producers
- SDSU, Animal and Range Science Department staff (Outreach Coordinator)
- other Advisory Team members and other project partners

The data collected was stored and managed by the project staff under the direction of the project coordinator. The project used participating producer and partners' expertise and equipment for data storage and analysis.

The information collected was used by the SDGLC to complete annual (October) reports of project activities, provide a copy to all project partners and funders and prepare the final report.
Mid-year reports were not required as the project was on schedule.
Evaluation of success in reaching the project goal was accomplished by monitoring project activities to measure meeting established milestones and contributions to improving sustainability of grassland operations. Overall, project success was

evaluated based on the monitoring data to ascertain the effectiveness of BMPs in protecting/improving water quality.

Monitoring Activities

Project activities were monitored and evaluated relative to project milestones. The information collected included:

- acres of grazing plans developed
- acres of grassland management plans implemented
- units of conservation practices installed to develop the grazing systems
- project accounting (expenditures, receipts, matching funds and their sources)
- location of operations assisted using GPS and entry into a GIS data base
- load reductions realized from the systems developed and
- evaluation of workshops/schools sponsored to determine if the activity in helping attain the overall project goal

The data collected is included in the Project Goals, Objectives and Tasks Section of this report by product.

Evaluation

The data collected through monitoring activities indicate that:

- most project milestones were met or exceeded
- the outreach component of the PIP was successful in transferring information about and increasing participation in the project
- there is support for managed grazing as an effective environmental practice by conservation and nature groups such as the Sand Country Foundation, ornithologists and the World Wildlife Fund and
- managed grazing practices reduce NPS pollution to surface waterbodies

See next section for load reduction information.

Even though project milestones were met or exceeded, and attendance at outreach meeting greater expected, the rate of the installation of managed grazing practices is projected to have been slowed somewhat by drought.

Drought has always been a factor for grassland management in South Dakota. The central and western portions of the state have been in increasing drought conditions throughout much of the project period. Figures 18 and 19 illustrate the increasing drought-affected area of the state. While interest in forage management has increased due to the drought, the planning and implementation of conservation practices slowed as producers became increasingly focused to locating additional pasture or supplemental feed and possible herd sell down. During September 2017, over 86 percent of South Dakota was categorized D0-D4 which is abnormally dry to exceptional drought. Forty four percent was D2-D4 category.

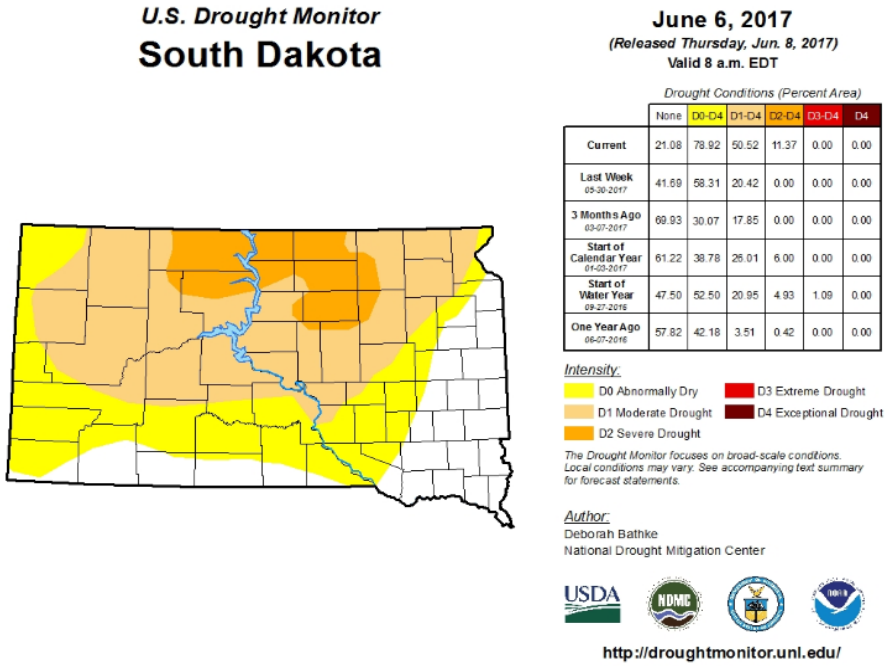

Figure 18: June 6, 2017 US Drought Monitor map of South Dakota

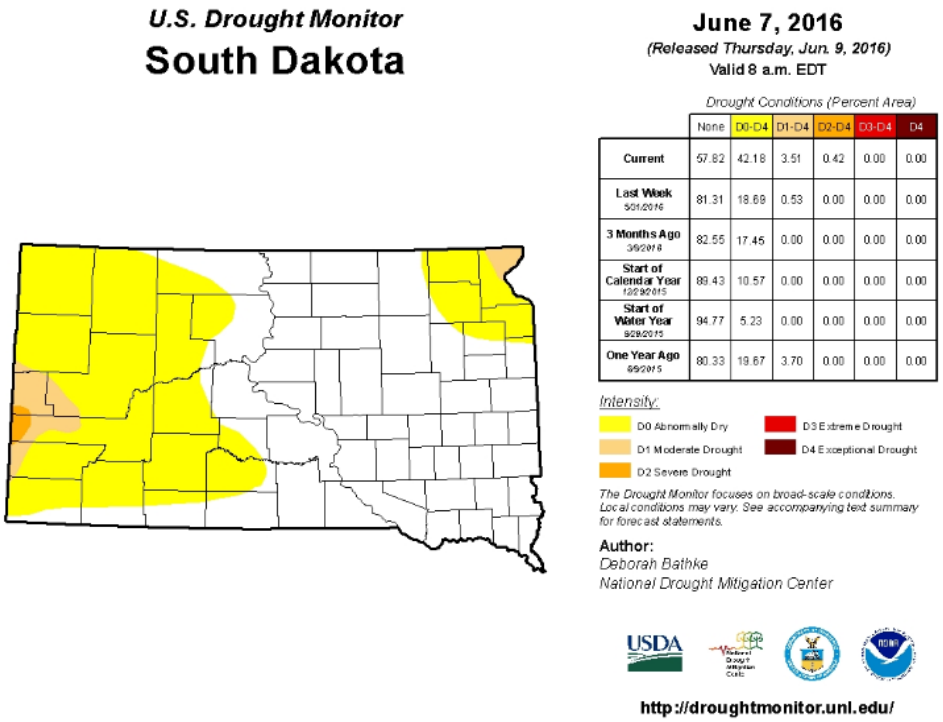

Figure 19: June 7, 2016 US Drought Monitor map of South Dakota

Data collected at riparian demonstration sites in eastern and western South Dakota during previous project segments provided evidence that management practices that entice livestock to drink from sources other than the riparian area are beneficial to water quality.

Results from rainfall simulation show that:

- runoff, sediment yield and nutrients entering eastern South Dakota streams from pasturelands is likely quite low whereas in western South Dakota, runoff and sediment can be significant during intense rainfall periods leading to gully erosion, and that
- proper stocking rates leading to good vegetation and litter cover are important to enhance infiltration and reduce runoff

Data collected at eastern SD demonstration sites during project Segment 2 suggest that:

- livestock grazing of riparian pastures in eastern South Dakota, does not impact sediment loading from the surrounding uplands

- the use of vegetation is was fairly even across the pasture monitored as indicated fusing vegetation measurements at different distances from the stream
- as riparian pasture size was relatively small at the eastern South Dakota locations, livestock distribution tends to be even across the pasture, and
- cattle tend to not overgraze near the stream, possibly because vegetation is not as palatable and/or hummocky terrain deters livestock from over using these areas
- To minimize stream bank erosion and reduce direct access to streams by livestock, alternative water sources, rock crossings, and fencing could be effective strategies. Fencing out wide buffers alongside the stream may not be necessary

LOAD REDUCTIONS

Load reductions obtained from the systems grazing installed (Table 10) were determined using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) developed by EPA Region 5. The load reductions achieved were:

- entered in the DENR project management system (Tracker)
- provided to watershed project coordinators for use in determining total daily maximum load (TMDL) implementation and
- included in annual reports prepared using the format provided by DENR to facilitate entry into EPA's Grants Reporting and Tracking System (GRTS)

Table 10. NPS load reductions realized from grazing system installed.

NPS Pollutant	**Load Reduction**	
	Project Segment 4	**Cumulative**
Nitrogen (lbs.)	183,810	788,226
Phosphorus (lbs.)	38,555	148,523
Sediment (tons)	19,858	88,721

During project Segment 4 the TMDL watershed assessment and implementation projects provided load reduction data for the 27 drainage areas that follow bring the total drainage areas to 107 for Segments 2, 3 and 4, see Table 11.

Table 11. Reductions by Reach

Grassland Management Planning Project Segment 4			
Reach	Nitrogen reduction (lbs)	Phosphorus Reduction (lbs)	Sediment Reduction (tons)
SD-BA-R-BAD_01	4,913	1,279	918
SD-BF-R-BELLE_FOURCHE_05	9,085	1,563	889
SD-BS-R-BIG_SIOUX_03	946	138	63
SD-BS-R-WILLOW_01	2,426	355	175
SD-CH-R-BOX_ELDER_01	5,716	1,183	760
SD-CH-R-CHEYENNE_04	39,083	6,592	3,690
SD-CH-R-CHEYENNE_06	2,545	564	377
SD-GR-R-GRAND_01	1,590	299	181
SD-JA-R-ELM_01	88	23	17
SD-JA-R-FIRESTEEL_01	8,169	798	187
SD-JA-R-JAMES_09	225	30	14
SD-JA-R-WOLF_SP_01	7,506	1,101	542
SD-MI-R-ANDES_01_USGS	10,703	1,467	669
SD-MI-R-CHOTEAU_01	822	178	116
SD-MI-R-CROW_01	2,021	300	150
SD-MI-R-EAST_FORK_PLATTE_01_USGS	1,634	170	48
SD-MI-R-FRANCIS_CASE_01	8,134	1,797	1,197
SD-MI-R-LEWIS_AND_CLARK_01	988	184	111
SD-MI-R-MEDICINE_KNOLL_01	1,950	310	165
SD-MI-R-OAHE_01	8,997	1,606	938
SD-MI-R-PLATTE_01_USGS	4,070	821	314
SD-MI-R-SHARPE_01	2,245		968
SD-MI-R-SPRING_01	1,556	298	183
SD-MN-R-WHETSTONE_S_FORK_01	1,349	188	88
SD-MU-R-MOREAU_01	7,848	1,127	543
SD-WH-R-WHITE_02	1,261	362	270
SD-WH-R-WHITE_04	25,147	11,262	3,411
Unknown	22,793	4,560	2,874
Total	183,810	38,555	19,858

BEST MANAGEMENT PRACTICES DEVELOPED OR REVISED

While the development and/or revision of best management practices was not included in or added to the project implementation plan, monitoring activities:

- documented the effectiveness of the BMP as a NPS reduction tool for livestock producers
- provided information regarding the placement of practices to achieve reduction of nutrients, sediment and fecal coliform bacteria loads to TMDL waterbodies and
- increased the acceptance of managed grazing by not only livestock producers but also teachers, environmental organizations such as birders and the wildlife community
- SDSU mapping project will assist grassland managers in better protecting virgin grasslands and better select grasslands with the best potential for restoration to near virgin state

COORDINATION AND PUBLIC PARTICIPATION

Coordination

Project activities were directed by a project coordinator provided through a management agreement with SDACD. The coordinator was responsible for producer assistance, tour leadership, and assistance at the grazing school**.** The coordinator's activities were completed with supervision provided by SDACD and policy direction from the SDGLC board of directors.

In setting policy and program direction, the coalition board used input from partner agencies and organization. As indicated previously in this report, input and coordination of efforts between the partners was accomplished at resource meetings scheduled by partner agencies for similar purposes.

Coordination efforts to develop and review the accomplishments of cooperative agreements with partner agencies and groups were completed by direct interaction with the partner(s) who were party to the agreements. Among the partners with

which the coalition had formal or informal cooperative agreements during the project period were:

- NRSC
- USFWS
- SD GF&P
- SDSU
- SD Discovery Center and Aquarium and
- SD Farm Bureau

See Table 12 for a comprehensive list of project partners and their contributions to project success.

Public Participation

Public participation was encouraged using the activities completed to implement the project outreach and information transfer program (Objective 2). The activities included:

- workshops
- grazing schools
- news releases
- tours and
- field days

Refer to Table 3 for summaries of the activities listed above.

Table 12. Project Partners' contributions

Agency/Organization	Contribution
Nongovernmental	
SD Association of Conservation Districts	Provided interim coordinator through contractual services; technical assistance for administration and BMP planning through the 319 funded Watershed Planning and Assistance Project.
SD Ornithological Society	Organization and hosting bird tours.
SD Discovery Center and Aquarium	I & E mini grant for the Leopold Award
SD Farm Bureau	Grazing School for BeefSD program participants
World Wildlife Fund	Grazing Calendar cosponsor
Governmental	
Local	
Conservation Districts	BMP planning and installation.
State	
SD Department of Agriculture	Financial assistance for BMP installation and technical assistance to conservation districts.
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 through the use of fee funds; Consolidated Water Facilities Construction Fund grant for AWMs.
SDSU and SDSU Cooperative Extension Service	Project management and coordination; demonstration site establishment and monitoring and outreach activities.
Federal	
US EPA	Financial through Clean Water Act Section 319
USDA FSA	Financial assistance for BMP installation through the CRP Program.
USDA NRCS	Financial and technical assistance for BMP installation through the EQIP Program.
USDI FWS	Technical assistance for implementation of grassland seeding, grazing systems, multiple purpose ponds and riparian fencing Partners for Fish and Wildlife Program.

RECOMMENDATIONS

Aspects of the Project That Did Not Work Well

Some of the supervision strategies that had proven successful during previous project segments were continued.
During the project it was found that these were not working as anticipated. See recommendation for solution.

Recommendations

During Segment 5 the range consultant position will be outsourced to private consultants & SDSU Range personnel.

As demonstrated by the increasing number of participants in outreach activities and demand for the technical assistance to provide grazing management assistance listed below, it is recommended these activities should be continued.

- Persons attending the grazing school recommended continuing the activity and indicated they would encourage others to attend. In addition, attending the school is included in the BeefSD curriculum.
- The project conducted more than three times as many workshops and tours/field days than planned with a commensurate increase in attendance.
- The successes experienced by the project, its leadership and managed grazers have resulted in regional and national opportunities to reach a large urban and policy maker audience and thereby garner support for conservation programs.
- Unsolicited producer requests for assistance and attendance at outreach events often exceeds expectations and often stretches both project and partner staff capacities to provide requested services.

Based on the positive environmental and economic benefits realized from the activities completed during this and previous project segments, the continuation of support for the development and installation of managed grazing systems in SD is recommended.

PROJECT BUDGET AND EXPENDITURES

The project budget was amended during the project period to fund follow-up activities necessary to evaluate use of systems and assist producers with overcoming management skill and system design challenges encountered

The budget as amended with a comparison to actual expenditures appears in Table 13.

Table 13. Project budget expenditures comparison.

Item	BUDGET			EXPENDED		
	319	Other Funds	Budget Total	319	Other Funds	Expended Total
SALARY						
Outreach Coordinator	$29,556.92	$9,234.06	$38,790.98	$30,270.58	$9,234.06	$39,504.64
Project Work Group		$40,000.00	$40,000.00		$70,439.32	$70,439.32
Range Consultant/ Range Specialist	$164,395.64	$286,000.00	$450,395.64	$145,931.46	$324,564.91	$470,496.37
Administration	$10,690.00	$2,375.00	$13,065.00	$10,690.00	$11,390.00	$22,080.00
Range Consultant	$59,930.10		$59,930.10	$59,930.10		$59,930.10
NON SALARY						
Audit/Compilation	$5,130.00		$5,130.00	$5,130.00		$5,130.00
Cell Phone	$5,200.00		$5,200.00	$5,193.00		$5,193.00
Computer Maintenance/Lease	$6,700.00		$6,700.00	$6,335.84		$6,335.84
General Liability	$997.09		$997.09	-$2.91		-$2.91
Cultural Resources	$0.00	$4,000.00	$4,000.00			$0.00
Postage	$1,000.00		$1,000.00	$784.11		$784.11
Supplies	$8,500.00		$8,500.00	$8,337.57		$8,337.57
Travel	$80,785.00		$80,785.00	$79,239.64		$79,239.64
BMPs			$0.00			$0.00
Objective 1		$853,100.00	$853,100.00	$0.00	$510,956.25	$510,956.25
Objective 2	$4,502.14	$55,000.00	$59,502.14	$2,501.51	$5,600.00	$8,101.51
Objective 3	$2,613.11	$2,265.94	$4,879.05	$1,879.05	$2,000.00	$3,879.05
TOTAL	$380,000.00	$1,251,975.00	$1,631,975.00	$356,219.95	$934,184.54	$1,290,404.49
MATCH						
Grassland Coalition		$69,000.00	$69,000.00		$5,600.00	$5,600.00
Landowner Cash/In-Kind		$363,140.00	$363,140.00		$510,956.25	$510,956.25
State(CWSRF)		$215,000.00	$215,000.00		$214,734.06	$214,734.06
Other State		$152,560.00	$152,560.00			
Private Organizations		$10,000.00	$10,000.00		$70,439.32	$70,439.32
TOTAL		$809,700.00	$809,700.00		$801,729.63	$801,729.63
Federal Match-(Farm Bill Technical Assistance) Funds Ineligible					$132,455	
Matching total						$1,157,949.58
Percent Match						69%

CONCLUSIONS

As state previously in the evaluation component of this report, the data collected through monitoring activities indicate that:

- project milestones, were met or exceeded, (see Table 14 below for comparison summary)
- the outreach component of the PIP was successful in transferring information about and increasing participation in the project
- there is support for managed grazing as an effective environmental and sustainable agriculture practice by producer, conservation and nature groups and

Table 14. Comparison of planned vs. accomplished milestones.

Milestone	**Planned**		**Accomplished**	
	Segment 4	**Cumulative**	**Segment 4**	**Cumulative**
Grazing plans developed (acres)	256,000	636,000	496,317	974,000
Grazing plans implemented (acres)	192,000	612,000	363,836	908,362
Fence (feet, cross & exclusion)	240,000	545,000	284,375	960,507
Pipeline (linear feet)	250,000	500,000	367,292	899,265
Wells(number)	8	22	7	12
Tanks (number)	80	175	134	351
Dugouts/dams (number)	12	30	0	9
Grass seeding	1,500	1,950	1,019	1,951
Grassland Birding Tours	4/200	4	4/246	11/673
Grazing School	4/100	11/275	5/154	18/502
Leopold Award Tours	4/300	4/300	3/542	6/892
Meetings & Workshops	12/360	29/1,410	33/2,416	80/4,681
News Releases- print & elect.	8/192,000	181/1,838,800	52/2,241,865	176/7,786,272
Website	1	1	1	1
Reports	5	23	5	23
Administration	1	3	1	3