

CLEAN WATER ACT SECTION 319

NONPOINT SOURCE CONTROL PROGRAM

FINAL REPORT

GRASSLANDS MANAGEMENT AND PLANNING PROJECT

SEGMENT 2

SPONSOR

SOUTH DAKOTA GRASSLANDS COALITION

PROJECT COORDINATOR

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DECEMBER 2010

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

Grants C9998185-03, C9998185-04 and C9998185-07

EXECUTIVE SUMMARY

Project Title: Grasslands Management and Planning Project – Segment 2

Grants: C9998185-03, 99185-04 and 998185-07

Project Start Date: July 1, 2007

Project Completion Date: December 31, 2010

Funding:	Total Project Budget		\$1,762,487.00
	Section 319 Grants	998185-03	18,000.00
		998185-04	112,870.00
		998185-07	400,000.00
	Total Section 319 Grants		\$530,870.00
	Total Expenditures of EPA Funds		\$530,870.00
	Total Section 319 Match Accrued		\$350,779.00
	Total Expenditures		\$906,509.00

The project goal was:

Reduce sediment, nutrient and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition. By reaching the goal, water quality and wildlife habitat will be improved, biodiversity increased and grassland manager economic sustainability maximized.

The South Dakota Grassland Coalition sponsored the three-year project with support from agricultural organizations, agencies, local government, and South Dakota State University. The objectives of this project segment were:

1. Plan (60,000 acres) and implement (120,000 acres) grassland management systems and
2. Complete an information and education program that includes on-ranch demonstrations, tours, workshops, web site, grazing schools, video, and news media events, (feature articles, TV).

Through the South Dakota Grazing Management & Planning Project, initiated during July, 2001, grassland managers, grassland and livestock organizations, and local, state, and federal agencies formed partnerships to design, implement, and monitor "management intensive" grazing systems.

As the partners implemented the workplan for this and previous project segments they were mindful of the need to balance management methods used so that the grazing system operator realized increase profits from improving the ecological status of the grasslands, improving water quality and providing habitat for a healthy, more diverse wildlife population

When the project began, an estimated 83 percent of South Dakota's grasslands were rated in poor, fair, or good condition (ecological status) providing less than optimum environmental and economic benefits. Since 2001, 140 livestock producers who manage nearly 550,000 acres of grassland in 36 counties have received assistance for the development and implementation of managed grazing systems that range from 30 to over 31,500 acres in size. Of the total, 53 producers who manage approximately 166,000 acres were provided assistance during project segment 2. The practices installed and management techniques adopted have resulted in improved range condition by at least one ecological class condition level, primarily from fair to good.

In addition designing and installing managed grazing systems, information learned from on-ranch demonstrations and other producers was shared with other grassland managers, researchers, agency specialists, and the public. Information about the sites and the lessons learned is available by visiting:

<http://www.sdconservation.org/grassland/managing/gmd/index.html>

According to an evaluation conducted by South Dakota State University of two demonstration sites, "good grassland management stabilized forage production and thereby improved efficiency of the water cycle by reducing runoff".

Opportunities to learn about the project and the environmental and economic benefits of managed grazing were provided to over 2,000,000 individuals. The total includes estimated booth traffic at events (conferences, trade shows, etc.); attendance at field days, workshops, and meetings; circulation of periodicals and radio station market share.

An unexpected outcome of the grassland project was the development of working relationships with nature and environmental groups or members of groups such as the South Dakota Ornithologist Union and the Sand County 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 maybe a critical factor in generating support for programs that will slow the conversion of grass to crop land that is taking place in the Prairie Pothole region. Central SD is an area where the rate of conversion is especially high.

The Sand County foundation sponsors the Leopold Conservation Award. The award recognizes leadership in voluntary conservation and ethical land management. During 2010, because of the SD Grasslands Coalition's demonstrated success with the implementation of grassland conservation practices, the foundation partnered with the coalition to serve as the sponsor for the Leopold Conservation Award in South Dakota. The coalition is in the process of identifying additional partners and sponsorships for the awards program.

Using the activities developed, program efforts are expected to continue to bring grassland acres under active grazing management plans, resulting in improved range conditions that will lead to improved water quality across the state.

The project goal was attained.

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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 (formerly the Management Intensive Grazing Systems (MIG) Project). The project was funded in part by Environmental Protection Agency (EPA) Clean Water Act Section 319 Project Grant numbers C9981850-3, C9981850-4 C9981850-7 awarded through the South Dakota Department of Environment and Natural Resources (DENR).

The current, as well as the previously referenced projects, were completed 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 during 1998, its principle project partners have included 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), and
- DENR

Each project partner 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 (NRCS) 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 Managed Intensive Grazing Project Implementation Plan (PIP) from 1999 to 2001, project activities centered primarily on establishing demonstration sites to showcase the grazing system alternatives that grassland managers could employ to improve forage production by improving range condition. The improved range condition and associated forage production increase would, in turn, increase the pounds of livestock produced on a per acre basis while at the same time improving range condition and thereby reducing NPS.

A map showing the locations of the demonstration sites established is available by visiting:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

Accomplishments realized and challenges encountered during the MIG and Segment One projects are summarized below.

For a more complete description of the activities and outcomes visit the web sites listed below:

<http://denr.sd.gov/dfta/wp/WQProjects/Grasslands.pdf>

<http://www.sdgrass.org/>

<http://www.sdconservation.org/grassland/managing/gmd/index.html>

During the implementation of the South Dakota Grazing Management & Planning Project (MIG) grassland managers, grassland and livestock organizations, and local, state, and federal agencies partnered to design, implement, and monitor six managed grazing demonstration sites totaling 7,681 acres. Information gained from the on-ranch demonstrations and other producers was shared with grassland managers, researchers, agency specialists, and the public.

The successes realized from the activities completed during the MIG Project were used to develop the initial Grasslands Management and Planning Project workplan implemented during 2001 – 2007. Financial assistance for the project was provided by a Section 319 Implementation Project Grant number C9998185-01 secured through DENR. During completion of the project, here-in-after referred to as project segment 1, SDGLC and its project partners installed or were responsible for the installation of grazing management practices on more than 380,000 acres that resulted in the reduction of Nitrogen, Phosphorous and fecal coliform bacteria entering South Dakota's lakes and streams by 166,974 lbs, 32,227 lbs and 19,484 tons respectively,

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 Segment one that provided managed grazing information and opportunities to more than 2,200,000 people included:

- 4 grazing schools – total attendance = 78 ranchers and resource managers,
- 15 ranch tours including 3 bird tours – total attendance = approximately 800 individuals,
- 21 media events (number includes news release booths and the *Range & Pasture Journal* insert in the *Cattle Business Weekly*) – total circulation/listeners = more than 1,517,000,
- 12 workshops, including holistic resource management workshops (HRM), total attendance = 345, and
- continuation/expansion of the demonstration sites established during the MIG Project.

Project segment 2 was designed to continue the implementation of NPS reduction BMPs on grasslands initiated during the MIG and project segment 1. During the completion of the two and one-half year project period, The SD Grassland Coalition and its project partners:

- provided 29 livestock producers who manage over 79,952 acres of South Dakota grasslands with the assistance needed to design and install grazing systems that ranged in size from 22 to more than 17,750 acres and assisted 23 producers who manage 86,043 acres with the installation of grazing systems planned by other agencies,
- maintained two of the demonstration sites developed during the MIG and project segment 1 and developed an additional three demonstration sites to showcase managed grazing alternatives and evaluate the economic and environmental benefits provided by the systems,
- sponsored field days and tours attended by more than 1,500 producers and resource managers,
- conducted three Grazing schools attended by 78 ranchers and resource managers,
- maintained the project website which was visited 112,700 times,
- Presented project related information at 27 workshops/conferences attended by approximately 5,600 individuals,
- hosted seven exhibits/displays at livestock shows, conventions, and workshops, and
- distributed 10 news releases to local media outlets.

During all project phases, there was a trend for producers requesting assistance to be those whose grazing lands were rated in the fair, good and excellent categories while those with lands rated as poor were less likely to participate.

Based on information provided by resource inventories and follow-up activities with producers who installed grazing systems, it is proposed that the practices installed resulted in 75 percent of participant's grasslands improving by one ecological class.

The completion of activities planned at the demonstration sites encountered several challenges. Many of the challenges were related to a less than expected level of producer "buy-in" and difficulties with attracting summer interns. The latter difficulty was determined related to challenges SDSU encountered with maintaining continuity in the liaison assigned to coordinate activities with the University. In summary:

- several producers chose to end participation after college interns were not available to assist with the monitoring activities,
- one producer withdrew because of multi-generational farming/family related issues, and
- another producer changed his grazing management program to the extent it did not demonstrate managed grazing practices; which resulted in the SD Grassland Coalition withdrawing the site from the project.

An unexpected outcome of the grassland project was the development of working relationships with nature and environmental groups or members of groups such as the South Dakota Ornithologist Union, Sand County Foundation and North Dakota and Nebraska Grasslands programs.

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 maybe 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.

The Sand County foundation sponsors the Leopold Conservation Award. The award recognizes leadership in voluntary conservation and ethical land management. During 2010, because of the SD Grasslands Coalition's demonstrated success with the implementation of grassland conservation practices, the foundation partnered with the coalition to serve as the sponsor for the Leopold Conservation Award in South Dakota. The coalition is in the process of identifying additional partners and sponsorships for the awards program.

<http://www.sandcounty.net/initiatives/lca/southdakota/>

SD managed grazers recognized for their environmental stewardship accomplishments by other organizations are profiled below.

Bill and Pennie Slovek, who ranch northwest of Philip, SD, were the recipients of the 2006 South Dakota Section of Society of Range Management Excellence in Grazing Management Award. The Sloveks were also nominated National Cattlemen's Beef Association's (NCBA) Environmental Stewardship Achievement Program (ESAP) award during 2009 and 2010. The Environmental Stewardship Award Program recognizes the outstanding stewardship practices and conservation achievements of United States cattle producers from across the nation each year.

Jim and Carol Faulstich along with their daughter and son-in-law Jacquie and Adam Roth were the 2009 Region VII National Cattlemen's Beef Association's Environmental Stewardship Award winners. They were nominated by the South Dakota Grasslands Coalition, and endorsed by United States Fish and Wildlife Service-South Dakota Partners for Fish and Wildlife Program, South Dakota Section-Society of Range Management, and the South Dakota Natural Resources Conservation Service. For additional information visit:

http://www.youtube.com/watch?v=RaT1RHilg_U

During the segment 2 project period, the PIP was amended four times. Two of the amendments were to the project budget. See the budget section of this report for specific information. The third and fourth amendments extended the project period.

A descriptive summary of the activities completed during project segment 2 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

Project Goal

The project goal was:

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

To attain the goal, activities were selected to reach objectives established to provide grassland managers in South Dakota with the technical assistance needed to develop and install managed grazing systems and implement an information transfer program. By completing the activities selected to reach the objectives and thereby attain the project goal, water quality and wildlife habitat will be improved, biodiversity increased and grassland manager economic sustainability maximized in South Dakota.

The project activities and milestones established as indicators of success are presented and summarized as amended

Accomplishments by Tasks

Objective 1: Provide technical assistance to grassland managers to complete the planning and design of an additional 60,000 acres of rotational grazing systems, and complete the implementation of rotational grazing systems on an additional 120,000 acres of grasslands by December 31, 2010.

Grasslands in 319 water quality project areas and riparian areas in southeast South Dakota were given technical assistance priority during this project segment. Completion of the activities included in the workplan tasks were planned to result in the cumulative total number of acres planned and implemented by the project to 210,000 and 450,000 respectively.

Task 1: Provide grassland management system planning, design, and monitoring technical assistance by working cooperatively with project partners.

Product 1: Grazing Management Plans on 60,000 grassland acres.

Information regarding how to request assistance from project staff and how the requests would be evaluated and applications prioritized were available from project personnel, local conservation districts and watershed project offices or by visiting:

<http://www.sdconservation.org/grassland/managing/started.html>

Project staff and contract consultants developed plans for the grazing systems using the methods and practices outlined in the USDA NRCS National Planning Procedures Handbook, National Range and

Pasture Handbook, and the South Dakota Technical Guide. Refer to USDA FSA standards for Conservation Practices or the USDA NRCS electronic Field Office Technical Guide (efotg) for a description of the methods and practices.

Both of the USDA publications are available by accessing: the following web sites:

<http://www.fsa.usda.gov/FSA/webapp?area=fsahome&subject=landing&topic=landing>

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

Plans for 29 producers from 11 Counties who manage 79,952 acres (Table 1) were developed by project staff during project segment two. This number plus those plans developed by other agencies and project partners (Table 2) as a result of project activities equals plans for 52 producers in 16 Counties and encompass 167,995 acres.

Table 1. Managed Grazing Plans Developed By Project Staff.

County	Number of Producers	Acres
Aurora	2	1,615
Brule	6	6,318
Buffalo	6	16,442
Butte	3	12,818
Faulk	1	6,000
Hand	1	4,791
Jerauld	3	4,096
Meade	1	17,756
Miner	1	487
Moody	4	529
Walworth	1	9,100
Total	29	79,952

Table 2. Grazing Plans Developed As A Result of Project Activities.

County	Number of Producers	Acres
Aurora	1	640
Brookings	1	1,036
Brule	2	4,600
Butte	1	6,734
Campbell	1	4,000
Charles Mix	1	2,000
Clark	1	2,212
Haakon	1	7,000
Harding	1	3,384
Hyde	4	10,468
Jerauld	2	2,733
Jones	1	2,512
Lyman	1	2,611
Meade	2	21,676

Potter	2	5,237
Walworth	1	9,100
Total	23	86,043

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 practices used and a comparison of those used to planned for both this and previous project segments are shown in Table 3.

Table 3. Practices used to Install Managed Grazing Systems.

Practice	Practice Code	Units			
		Project Segment 2		Cumulative	
		Planned	Installed	Planned	Installed
Planned Grazing (Acres)	528 Prescribed Grazing	120,000	167,995	420,000	574,526
Fence -Cross &Riparian Exclusion (linear Feet)	382 Fence & 390 Riparian Exclusion	100,000	128,635	205,000	459,850
Pipeline (Linear Feet)	516 Pipeline	80,000	104,476	130,000	396,080
Rural Water Hook-ups (Number)	516 pipeline	2	0	2	2
Tanks (Number)	614 Watering Facility	25	39	55	148
Dams/Dugouts (Number)	378 Pond	2	6	12	6
Grass Seeding (Acres)	512 Introduced Species & 550-Native Species	100 .	505	350	732
Stream Crossings (Number)	578	1	0	1	0
Wells (Number)	642 Water Well	0	4	10	5

An example of a grazing plan developed is shown in Figure 1. The system is divided into 10 paddocks using cross fence. Water is supplied using a pipeline and three tanks with each tank positioned to serve multiple paddocks.

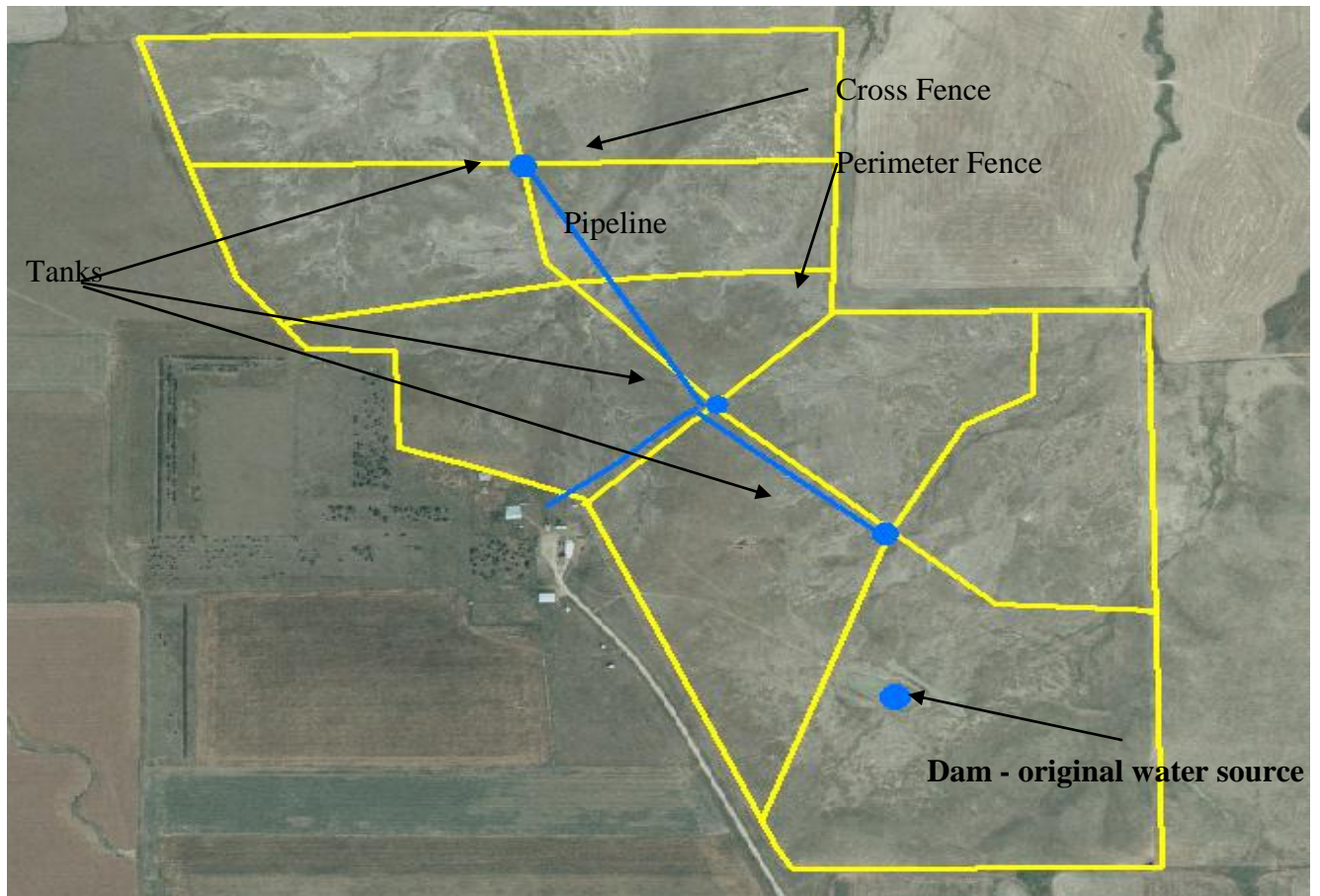


Figure 1. Managed grazing system design.

Funds to provide the technical assistance needed to develop the grazing plans were provided by:

- NRCS – Environmental Quality Incentives Program (EQIP),
- FSA- Continuous Conservation Reserve Program (CCRP) and
- US FWS-SD *Partners for Fish & Wildlife Program* italics is what they call the program in SD.

Livestock producers who developed a grazing system were provided with tools to aid in managing and monitoring the systems. The tools included a copy of *Grassland Plants of South Dakota and the Northern Great Plains* and a grazing stick. *Grasslands Plants of South Dakota and the Northern Great Plains* published with support from the South Dakota Department of Environment and Natural Resource's 1998 Clean Water Act Section 319 NPS Grant from EPA (C9998185-98) and the 319 NPS Grant awarded to SDACD through DENR for the Bootstraps Inventory and Coordination Project (C9990185-97).

A grazing stick, Figures 2 and 3, 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. Funds to purchase 4,000 grazing sticks were provided by the United States Fish and Wildlife Service-South Dakota Partners for Fish and Wildlife program and this project. An additional 2,000 grazing sticks were purchased using funds provided by SDGF&P, US FWS' SD

Partners for Wildlife Program, and the North Central Resource Conservation and Development Association (NC RC&D)

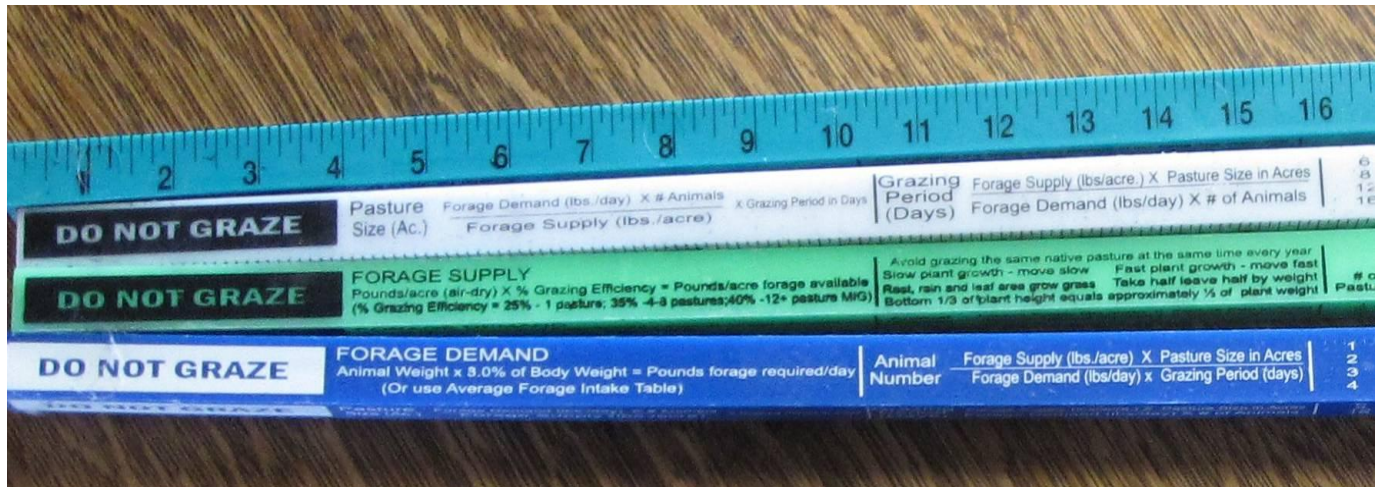


Figure 2. Grazing stick.



Figure 3. Grassland managers and producers learning to use a grazing stick.

Milestones:

Project Segment 2 - Planned - 15 grassland grazing system plans/year @ 2000 ac/plan = 30,000 acres; 30 plans/2 years @ 2,000 ac/plan = 60,000 acres.

Accomplished – 29 plans-encompassing 79,952 acres developed by project staff;
23 plans encompassing 86,043 by project partners. Total = 52
plans encompassing 167,995

Cumulative – Planned – 61 plans encompassing 207,622 acres plus eight demo sites encompassing
7,681 acres

Accomplished – 140 plans encompassing nearly 550,000 acres planned by project staff
and project partners.

Product 2: Implement improved grassland management systems on 120,000 acres of grasslands.
The total includes the 60,000 acres planned by the project, and 60,000 acres planned
and implemented with significant technical assistance from partnering agencies.

Technical assistance to install the practices selected (Table 3) to construct grazing systems that
encompass 165,995 acres in 36 counties for 53 producers (Tables 4 and 5) was provided during
project segment 2. The assistance was provided by project staff and:

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

The Tables 4 and 5 also include cumulative total of acres of managed grazing systems installed since
the project's inception during 1999. When totaled, the acres of managed grazing installed using
plans developed by the project and its partners equals 454,890 managed by 140 producers.

Financial assistance to install the practices 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 Project Grants (Bachelor Creek, and Lake Faulkton watershed projects)

The practices used to install the systems during this project segment and the cumulative total
installed during all project segments are listed in Table 3 (Product 1)

The fences installed include single wire, three wire high tensile electric or poly wire. Three wires
were most often used for an exterior fence; the single wire is used for cross fence within a system.

Grass seedings were 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.

While steam crossings were included in the practices planned, none were determined to be necessary at the locations where systems designed were installed.

Options to supply water to a grazing system included rural water systems, wells and dams/dugouts. Rural water systems were the method of choice because rural water provides:

- a reliable source of water,
- clean water which promotes improved herd health,
- reduced the incidences of livestock entering surface water bodies, and
- the most consistent positive environmental and economic benefits.

Table 4. Managed Grazing Systems Installed Using Plans Developed By The Project.

County	Number of Producers		Cumulative	Acres		
	Project-Segment 2	Project-Segment .1		Project-Segment 2	Project-Segment 1	Cumulative
Aurora	2	1	3	1,615	2,376	3,991
Beadle		1	1		2,895	2,895
Brookings		1	1		2,429	2,429
Brule	6	6	12	6,318	12,645	18,963
Buffalo	6	7	13	16,442	76,455	92,897
Butte	3	3	6	12,818	16,322	29,140
Charles Mix		1	1		2,040	2,040
Clay		1	1		300	300
Faulk	1	10	11	6,000	9,089	15,089
Haakon		1	1		13,000	13,000
Hand	1	1	2	4,791	320	5,111
Hyde		3	3		7,620	7,620
Jerauld	3		3	4,096		4,096
Kingsbury		1	1		720	720
Lincoln		1	1		217	217
Lyman		3	3		20,319	20,319
McPherson		1	1		5,360	5,360
Meade		1	1	17,756		
Mellette		1	1		2,400	2,400
Miner	1	1	2	487	120	607
Minnehaha		2	2		290	290
Moody	4	6	10	529	3,269	3,798
Pennington		1	1		6,400	6,400
Potter		1	1		2,300	2,300
Sanborn		1	1		585	585
Stanley		1	1		13,398	13,398
Tripp		1	1		179	179
Turner		2	2		191	191
Walworth	1	2	3	9,100	6,383	15,483
Total	29	61	90	79,952	207,622	287,574

Table 5. Managed Grazing Systems Resulting From Project Related Activities.

County	Number of Applicants			Acres		
	Project Segment 2	Project Segment 1	Cumulative	Project Segment 2	Project Segment 1	Cumulative
Aurora	1		1	640		640
Brown		1	1		800	800
Brookings	1		1	1,036		1,036
Brule	2		2	4,700		4,700
Buffalo		1	1		86,500	86,500
Butte	1		1	6,734		6,734
Campbell	1		1	4,000		4,000
Charles Mix	1	1	2	2,000	5,000	7,000
Clark	1		1	2,212		2,212
Haakon	1	2	3	7,000	5,500	12,500
Hand		1	1		480	480
Harding	1		1	3,384		3,384
Hyde	4	2	6	10,468	5,077	15,545
Jerauld	2		2	2,733		2,733
Jones	1	3	4	2,512	880	3,392
Lyman	1	7	8	2,611	20,590	23,201
Marshall		1	1		160	160
Meade	3		3	21,676		21,676
Mellette		2	2		31,246	31,246
Minnehaha		2	2		1,301	1,301
Moody		1	1		3,500	3,500
Potter	2		2	5,237		5,237
Sanborn		1	1		240	240
Todd		1	1		12,635	12,635
Walworth	1		1	9,100		9,100
TOTAL	24	26	50	86,043	173,909	259,952

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. Thirty nine water tanks were installed within the systems during project segment two; 148 total during all project segments.

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 4). The pipe is inexpensive, lightweight, and flexible and affords the system manager advantages over installing buried pipe. Using above ground pipe, producers can 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 4) 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 coupler the water is free flowing.

Aboveground pipe was installed during project segment 2 to provide water to 2,000 acres. Added to the above ground line installed to serve 25,000 acres during segment 1, a total of more than 100

grazing systems covering 27,000 acres installed above ground pipeline to supply water within a grazing system.

While there was interest in using portable water systems there was producer reluctance to adapting this alternative.

Although not in the workplan four wells were drilled. The use of a well was sometimes the best option because:

- access to a rural water system was not available or
- economics associated with the size of the system served favored wells over other options.

For large grazing systems (> 5,000 acres), the cost of a well versus other methods of supplying water is less on a cost/acre served basis than from other sources. Financial assistance for the four wells drilled during project segment 2 was provided using EQIP funds made available through NRCS.

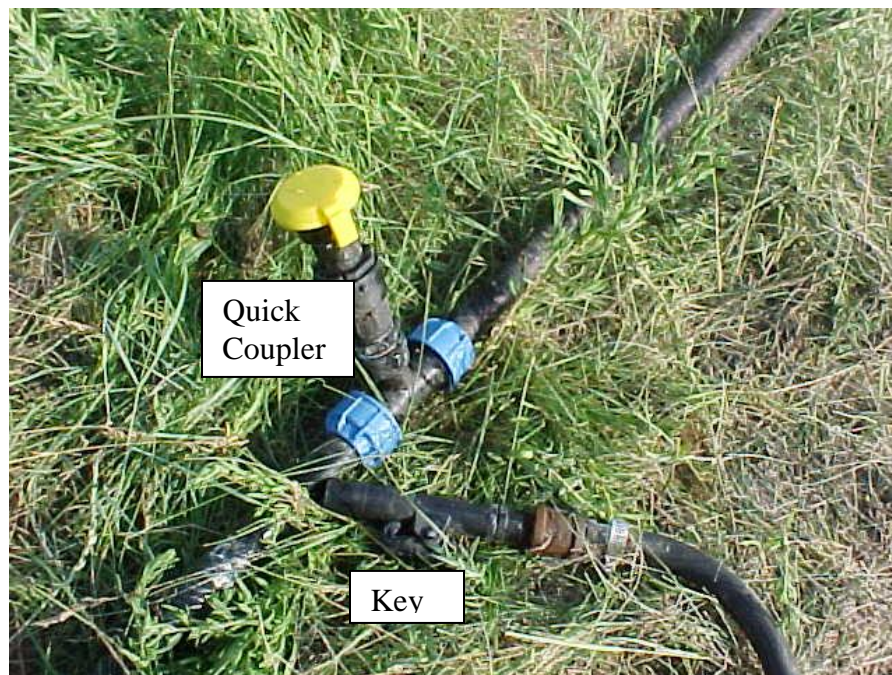


Figure 4. Above ground pipe with quick coupler.

Figure 5 shows the location of grazing systems installed during project segments 1 and 2 and the MIG Project. Systems installed during project segment 1 are coded green those installed during project segment 2 blue and demonstration sites red. For additional information regarding the location of the demonstration sites visit:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

Observations relative to the grazing systems planned and installed include:

- in general, the size of a system and paddocks within the system increases from east to west across the state,
- most of the land in the Buffalo County is owned by the Crow Creek Sioux Tribe,
- after the Crow Creek resource inventory was completed, The Lower Brule Sioux Tribe whose lands are across the river from Crow Creek engaged a private contractor to complete and inventory of their lands,
- the grasslands project and, therefore, many of the systems installed are a direct result of Bootstraps, a holistic farm ranch program developed with financial assistance from EPA 319 and Pollution Prevention Grants awarded through DENR, and
- the use of managed grazing as a water quality BMP has been incorporated into watershed project workplans, i. e., the Bachelor Creek Project in the east central area of the state.

The concentration of managed grazing systems installed in central SD can be attributed to this being the area in which the grasslands project started following a Bootstraps meeting. Since this time, grasslands project has been provided predominately by Bootstraps Program participants working in partnership with natural resource organizations and agencies.

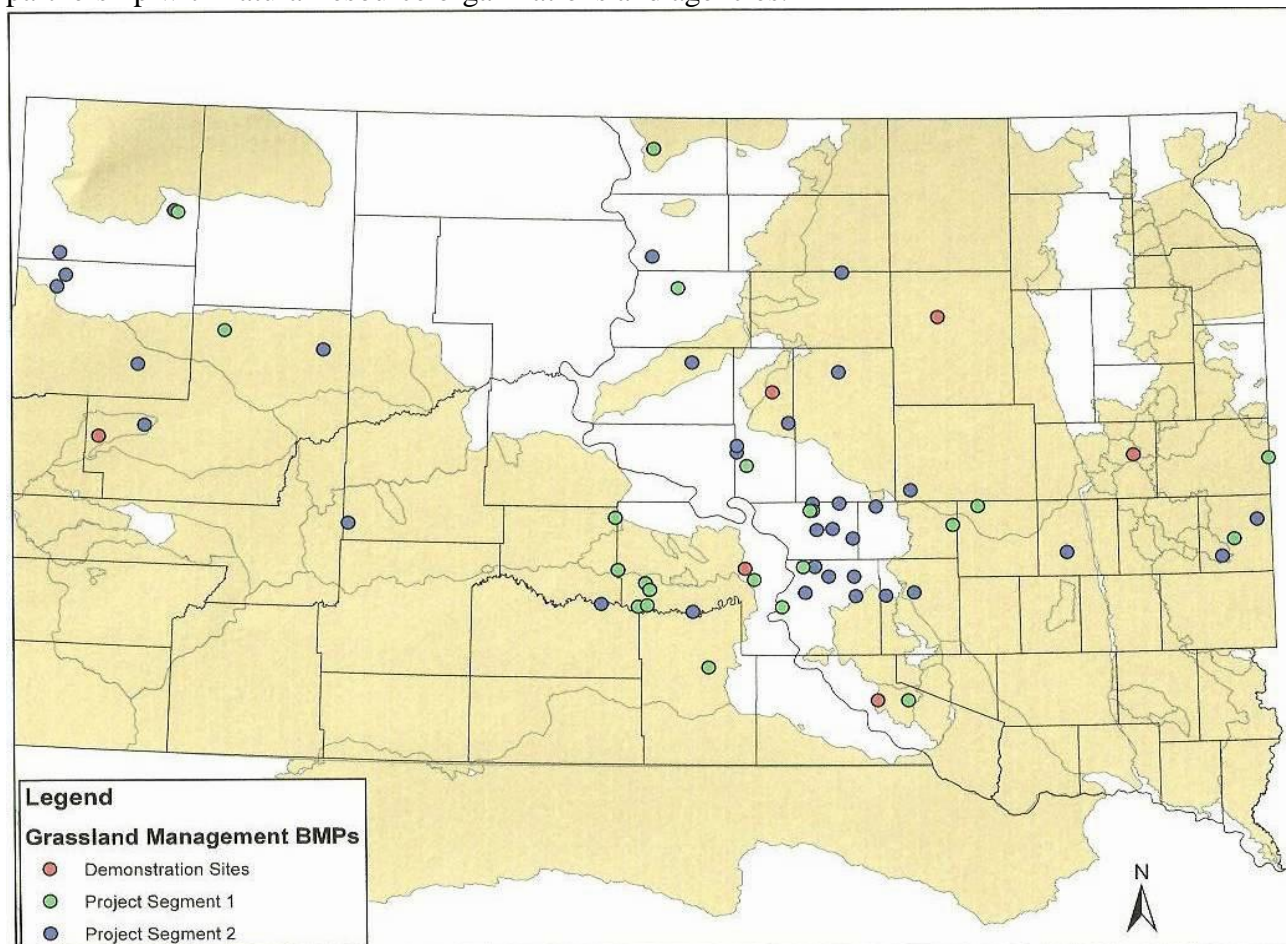


Figure 5. Locations of managed grazing systems installed.

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 this and previous project segments are listed in Table 6.

Table 6. NPS Load Reductions Realized From Rotational Grazing Systems Installed.

NPS Pollutant	Load Reduction	
	Project Segment 2	Cumulative
Nitrogen (lbs)	142,723	309,697
Phosphorus (lbs)	23,765	55,992
Sediment (tons)	13,153	32,637

Milestones:

Project Segment 2 - Planned - 60,000 acres planned by project staff + 60,000 acres planned by project partners - 120,000 acres installed.

Accomplished - Planned –79,952 acres planned by project staff + 86,043 acres planned by project partners = 165,995 acres

Cumulative – 287,574 acres planned by project staff + 286,952 acres planned by project partners = 547,526 acres

Objective 2: Transfer grassland management information to a minimum of 10,000 South Dakota producers, 20 researchers, 40 grassland specialists, and the public (400,000).

Task 2: Maintain two existing and establish one new on-ranch demonstration site, monitor the sites to document BMP effectiveness, and evaluate the impacts of improved grassland management on water quality and sustainability of the operation.

Product 3: Two previously developed on-ranch grassland management demonstration sites and one new on-ranch demonstration site monitored and evaluated.

The two demonstration sites developed during previous project segments selected to be retained during segment 2 were the Faulstich and Sip systems developed during 2000 and, 2001 respectively. The new demonstration site was established near the City of Elkton. The system is located in northeastern portion of the Central Big Sioux 319 Water Quality Implementation Project in accordance with the location priority established during project planning to demonstrate the positive economic and NPS pollution benefits of managed grazing in this area of the state effectiveness of managed grazing.

The practices used to install the new demonstration site with a comparison to the planned are shown in Table 7. The costs associated with installing the practices were shared by the landowner, East Dakota Water Development District, Moody County Conservation District using funds provided by the 319 funded Bachelor Creek Project and USFWS.

Table 7. Practices Used to Install the Big Sioux Grazing System Demonstration Site.

Practice	Conservation Practice	Planned	Actual
Fence	382 Fence 390 Riparian Exclusion	6,000 LF	15,000 LF
Pipeline	516 Pipeline	4,000 LF	3,053 LF
Tanks	614 Watering Facility	2 each	1 each

For information relative to the three sites visit:

[http://www.sdgrass.org/views/SDSU%202008%20riparian%20demonstration%20project%20report%20\(3\).pdf](http://www.sdgrass.org/views/SDSU%202008%20riparian%20demonstration%20project%20report%20(3).pdf)

Monitoring activities at the sites were completed by summer interns. The data collected was evaluated by a range specialist from SDSU whose services were made available through a contractual agreement.

Activities completed relative to the sites was modified during the initial portion of the project period when it became evident that producer involvement and availability of interns would not meet that anticipated during project planning.

Because of the change, the information presented for products 3 and 4 is consolidated and reported primarily using reports prepared by SDSU Range Management specialist in Appendices 1 and 2.

The monitoring plan for the demonstration site in and riparian demonstration sites was modified as outlined in Product 9.

Data relative to the impact of livestock grazing and on litter cover, vegetation cover and plant height was collected at was collected at five sites in eastern SD and two in the western portion of the state. The data indicates that grazing management systems are beneficial to water quality. Reports summarizing data collection by site and conclusion made based on the data is located in Appendix 1 (Eastern South Dakota Riparian Demonstration Site) and Appendix 2 (Riparian Demonstration Sites).

Milestones:

Project Segment 2 - Planned - Continue two existing demonstration sites and establish one new site in SE SD.

Accomplished - Monitoring and evaluation of three sites for two years (see product 9 - Monitoring) as amended.

Cumulative –Planned – 8 sites – 6 sites established during previous project segments and one during segment 2; monitoring data collected and reported for all active sites.

Accomplished – Total sites developed = 7; three maintained and monitored during segment 2; vegetation use and run off data collected at 5 sites in eastern SD and 2 in western SD.

Task 3: Complete information and education activities on grassland management and water quality impacts of improved grassland management targeted towards 319 water quality project areas, riparian grassland areas, and grasslands in South Dakota.

Product 4: Two grassland riparian area demonstration sites established by landowners located in existing 319 water quality areas.

See product 3 for information relative to riparian demonstration sites.

Product 5: Maintain the grazing management web site in partnership with the SD Association of Conservation Districts (SDACD), and update the Grassland Coalitions Display on South Dakota Grassland resources and management.

Activities completed as part of Product 5 were coordinated by the project coordinator.

The web site and display were developed and maintained to provide farmers/ranchers, resource managers, the research community, university students, and the general public information about managed grazing, project activities and opportunities for involvement in the project or other grazing related activities.

The grazing management web site established within the SDACD site during 2000 was expanded and maintained during the current project period. The site is available by visiting:

<http://www.sdconservation.org/grassland/managing/gmd/index.html>

Site features include:

- information about SD grasslands, grassland health and management
- descriptions and journals of demonstration site activities,
- interactive technical assistance bulletin board, and
- links to other grazing information resources.

The site was periodically updated and expanded to better serve producer and resource manager grassland information needs with operation and maintenance of the site being accomplished using services provided by the SDACD web master.

The number of site visits peaked at nearly 60,000 (Table 8) during calendar year 2008. The total number of “hits” exceeds the project milestone by nearly 3 times – 112,686 versus 30,000 and the commutative by more than twice the milestone - 180,400 versus -80,000.

Table 8. Website "Hits" During Project Segment 2.

Time Period	Projected	Actual
Milestone	30,000	
April 2007-June 2007		13,231
January 2008- August 2008		56,297
January 2009-September 2009		39,228
March 2010-October 2010		4,784
TOTAL	30,000	112,686

The Grassland display (Figure 6) was developed during the first project segment (2001). During the current project period, display board graphics and pictures and accompanying materials made available at events were updated by the project coordinator with assistance from NRCS-Public Affairs Personnel to reflect current grassland conditions and management methods and more recent project activities.

The display was used to promote grassland management at workshops, conferences, fairs and other events.



Figure 6. Project display at the 2010 Beef Day at the Capitol in Pierre, SD.

Milestones:

Project Segment 2 - Planned - Web Site maintained and available on continuing basis; 30,000 contacts during the two year project period; display board graphics and

pictures updated with 50 percent plus new material describing current grassland conditions, and management methods.

Accomplished – Web site maintained and available on a continuing basis;
112,686 hits during the project period; display board updated with new graphics and plant mounts both provided by NRCS.

Cumulative –Planned - 80,000

Accomplished – 293,092

Product 6: Complete information transfer and educational outreach activities on grassland management.

The project coordinator working in partnership with SDSU Range Science outreach staff 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 at workshops, tours and through the media. Project activities planned versus accomplished are summarized in Table 10. The table also includes a comparison of the cumulative activities completed to those planned.

The activities listed in Table 9 provided opportunities to learn about the project and the environmental and economic benefits of managed grazing to nearly 4,000,000 individuals 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 and radio station market size

Table 9. Information Transfer - Educational Outreach Activities Milestone Comparison.

Activity	Project Segment 2			Cumulative		
	Planned	Completed	Individuals Reached	Planned	Completed	Individuals Reached
Workshops	6	26	1,256	9	53	>2,000
Grazing Schools	2	3	118	4	8	247
News Releases-print media	4	14	699,219	15	34	1,246,543
News Releases-electronic media	150	5	>800,000	Not Available	15	>2,490,000
Tours/Field Days	2	15	833	15	47	2,350
Riparian-Tours	4	1		4		
Totals			1,501,426			>3,741,140

News releases and radio ads were not completed as planned. The decision not to issue releases as such was made when it was determined that inviting the media to project sponsored functions resulted in lead stories in the reporters publication versus a less visible location given a media releases.

Many of the activities completed during this project segment were a continuation of activities initiated during previous project segments and build on previous success. Therefore, the descriptive

information that follows is a summary of outreach and educational activities completed during all project segments.

Milestones:

Project Segment 2 - Planned – Workshops- 6

- Grazing Schools - 2 schools, 50 students
- News releases print media – 4
- News releases electronic media - 150
- Tours/field days - 2 events, 100 participants
- Riparian Tours - 4

Accomplished - Workshops-26

- Grazing Schools -3 schools; 118 students
- News releases print media – 14; 699,219 individuals reached
- News release/radio – 5; >800,000 individuals reached
- Tours - 15 events; 833 participants
- Riparian Tours - 1

Cumulative –Planned - Workshops- 9

- Grazing Schools –4 schools; 100 students
- News releases print media - 15
- News release electronic media – Not available
- Tours - 15
- Riparian Tours - 4

Accomplished – Workshops- 53; >2,000 individuals attending

- Grazing Schools - 8 schools; 247 students
- News releases print media – 34, 1,246,543 individuals reached
- News release electronic media – number not available; >2,490,000 individuals reached
- Tours - 15
- Riparian Tours - 4

Tours and Field Days

More than 800 farmers, ranchers, and resource managers attended the 15 tours and field days held during the project period (Table 11) to transfer information to producers and resource managers about the benefits of managed grazing. The tours and field days hosted during the current project period bring the total number hosted and attendance to 47 tours and 2,350 respectively.

The South Dakota Grasslands Coalition and the South Dakota Section of Society of Range Management partnered to host the July 2007 tour. The tour was held at the Bill and Pennie Slovek ranch located northwest of Philip, SD. The Sloveks were recipients of the 2006 South Dakota Section of Society of Range Management Excellence in Grazing Management Award. The South

Dakota Grasslands Coalition sponsored Gabe Brown, Bismarck, ND, to speak at the tour. Brown is a grazer and no-till farmer. His presentation described the cover crops he plants for feed or grazing as well as his watering system.

Table 10. Tours and Field Days.

Tour Site	Date	Participants	Comments
Slovek, Philip, SD	July, 2007	102	SD Grasslands Bus Tour
CLC Ranch	September, 2007	30	SD Grazing School Tour
Martin, SD	June 2008	10	Pasture Walk-Terry Gompert
Bristol, SD	June 2008	52	Bird Tour – Peckham Ranch
Sturgis, SD	June 2008	25	Pasture Walk-Terry Gompert
Bismarck, ND	July 2008	46	SD Grasslands Bus Tour
Valentine, NE	October 2008	80	Joint NE/SD SRM & NE Grazing Lands Coalition & SD Grasslands Coalition Tour
Belvidere, SD	June 2009	90	Bird Tour – Rasmussen – Lehman 33 Ranch
Leola, SD	July 2009	65	McPherson County Range Day with SDSU Extension Service& NRCS
Clear Lake, SD	July 2009	25	Coteau Hills Cattlemen’s Tour/workshop with & SDSU Extension Service
Yankton, SD/Plainview, NE	July 2009	85	Joint NE Grazing Lands Coalition/SD Grasslands Bus Tour
Quinn, SD	August 2009	60	Pasture Walk-Terry Gompert
Chamberlain, SD	August 2009	60	Pasture Walk-Terry Gompert
Wessington, SD	June 2010	64	Bird Tour – Paulson Ranch
White River, SD	July, 2010	39	Pasture Walk-LeAnna & Kevin Green
Total		833	

Based on the positive feedback to Brown’s presentation at Slovek ranch, the South Dakota Grasslands Coalition sponsored the 2008 bus tour to the Gabe Brown’s ranch located near Bismarck, ND. During the tour, Brown (Figure 7) emphasized that since he started planting cover crops, his fertilizer and herbicide use has decreased. In addition, Brown spoke about the importance of soil microbial activity.

During the second day of the tour, participants visited the Kenny Miller Ranch located south of Mandan, ND. Miller, an employee of the Burleigh County Soil Conservation District and a rancher, plants cover crops for grazing. During his presentation he discussed the soil health benefits of grazing.

A brochure announcing the bus tour and a copy of the handout that the Burleigh County Soil Conservation District provided during the tour is located in Appendix 3.



Figure 7. Brown and Fuhrer explain the use of cover crops during the 2008 grazing tour.

The 2009 bus tour visited two operations in the Yankton, SD, area July 21 and 22. During day one, the 46 participants toured two certified organic ranches located near Fordyce, NE. The first was a ranch that raises Scottish Highland cattle for grass finished beef (Figure 8); the second at an operation that has converted land with a center pivot irrigation system from cropland to pasture. That evening the participants heard a producer panel discuss extending the grazing season, swath grazing, and grass finished beef. During day two, participants toured a ranch near Plainview, NE, that had also converted a center pivot irrigated field from cropland to pasture. The operator uses stored forages to finish cattle and plants corn to graze instead of harvest for grain thereby reducing fuel and machinery expense.

The partnership with members of the SD Ornithological Society initiated during the first project segment was continued. Since the partnership was formed during 2008, society members and the project have cooperated to host three field days at managed grazing sites. Individuals attending the tours are eligible to receive continuing education credits Dakota State University. During 2008, the South Dakota Grasslands Coalition and the Grasslands Management and Planning Project hosted a bird tour at the Darwin Peckham ranch south of Bristol, SD. Peckham is a member of the South Dakota Grasslands Coalition Board of Directors. Fifty-two individuals participated. Sixty-one bird species, including a Northern Mockingbird, were recorded on the tour. An article about the tour was printed in the June 27, 2008, issue the *Aberdeen American News*.



Figure 8. Highlander Cattle move to a new paddock as tour participants watch.

The South Dakota Grasslands Coalition and the GMPCP hosted a third bird tour at the Rasmussen-Lehman 33 Ranch south of Belvidere, SD, during 2009. Dan Rasmussen, co-owner of the ranch, is a South Dakota Grasslands Coalition Board of Directors member. Ninety individuals (Figure 9) participated. Forty-four bird species were recorded during the tour. Fourteen individuals registered for continuing education credits took advantage of the opportunity. A brochure and a list of the bird species recorded are located in Appendix 4.



Figure 9. 2009 Bird Tour participants.

June 9 - 11, 2009, the South Dakota Grasslands Coalition hosted the National Riparian Team. The team includes representatives from several agency disciplines who work cooperatively to promote training on riparian management issues. Twenty five people attended the event which was headquartered at Sturgis SD. The total included: ranchers and representatives from:

- Bureau of Land Management (BLM)
- USDA Forest Service
- US Fish & Wildlife Service,
- United States Geologic Survey (USGS).
- Employees from the City of Rapid City,
- 319 project personnel,
- SD GF&P,
- SD Cooperative Extension Service
- conservation district personnel,
- RESPEC, 319 project personnel
- National Wild Turkey Federation biologist,
- NRCS personnel
- SD DENR,
- Tatanka RC&D and
- Ranchers .

Workshops

During December 2007, the South Dakota Grasslands Coalition; Brule, Buffalo, and Lyman Counties Bootstraps; Brule/Buffalo Conservation District and the GMPCP hosted Fred Provenza at a workshop held in Oacoma, SD. Provenza's research focuses on understanding behavioral processes and using that understanding to make management decisions. For more than two decades, his research emphasis has centered on understanding the role of learning herbivore food and habitat selection. Provenza has written 51 synthesis papers for peer-reviewed journals, books, and proceedings; and has 120 papers published in peer-reviewed journals. Provenza has been invited to

speak on more than 40 occasions at national and international symposia. Click on the link below to access a copy of Provenza's PowerPoint.

<http://www.sdgrass.org/ItemsOfInterest/ProvenzaPresentation2007.pdf>

During December 2008, the South Dakota Grasslands Coalition; Brule, Buffalo, and Lyman Counties Bootstraps; Brule/Buffalo Conservation District and the GMPCP hosted a workshop featuring Jim Gerrish at Oacoma, SD. Gerrish's experience includes more than 20 years of beef-forage systems research and outreach while on the faculty of the University of Missouri, as well as 20 years of commercial cattle and sheep production on his family farm located in northern Missouri.

The University of Missouri Forage Systems Research Center (FSRC) rose to national prominence as a result of his research leadership. His research encompasses many aspects of plant-soil-animal interactions and provided foundation for the basic principles of management-intensive grazing. Gerrish was co-founder of the 3-day grazing management school program at FSRC. Since their inception during 1990, these schools have been attended by more than 3,000 producers and educators from 39 states and 4 Canadian provinces.

Before moving to Idaho, Gerrish was involved with the Green Hills Farm Project, a grassroots producer group centered in north-central Missouri which promotes sustainability of family farms. His research and outreach efforts have been recognized by the American Forage and Grassland Council, Missouri Forage and Grassland Council, National Center for Appropriate Technology, USDA-NRCS, the Soil and Water Conservation Society, and Progressive Farmer.

A South Dakota Grassland's Coalition's December 2008 newsletter article featuring Jim Gerrish's presentation is available by visiting:

<http://www.sdgrass.org/nwsltrs/2008%20Newsletters/December%202008%20newsletter.pdf>

January 6, 2009, the South Dakota Grasslands Coalition hosted Kirk Gadzia. Gadzia, who is from New Mexico, is a Certified Educator with the Holistic Management International Center. He has more than 20 years of experience teaching the concepts of Holistic Management[®] worldwide.

Gadzia is co-author of the National Academy of Sciences book *Rangeland Health*. He holds a BS degree in Wildlife Biology and an MS in Range Science. He works directly with producers to achieve profitability in their operations and also provides customized training and consulting to a wide variety of conservation organizations. Years of assisting people on the land helps Gadzia approach the course in an interactive, hands-on style. His courses are known for a relaxed atmosphere, open dialogue and practical real-life examples.

The workshop was held at the Cedar Shores Resort located in Oacoma, SD. Forty-nine livestock producers and resource manager attended the workshop. Click on the link below to access an article about Kirk Gadzia's presentation which was printed in the South Dakota Grassland's Coalition's December 2009 newsletter.

<http://www.sdgrass.org/nwsltrs/2009%20Newsletters/February%202009%20newsletter.pdf>

During project segment 2, the South Dakota Grasslands Coalition and the Grasslands Management and Planning Project sponsored nine Holistic Resource Management (HRM) courses attended by a total of 414 livestock producers and resource managers.

The three 2008 courses were taught by Terry Gompert a University of Nebraska Extension Educator with expertise in grazing education. Gompert who is working toward holistically management of his cow herd and ranch located near Center, Nebraska, is enrolled in the Holistic Management Certified Educator Training Program. The workshop locations and attendance at each were:

- Watertown, SD – 91,
- Platte, SD - 45 and
- Parkston, SD – 52.

Five HRM courses were taught during 2009. Four of the courses were taught by Terry Gompert, a University of Nebraska Extension Educator with expertise in grazing education. Gompert is working toward holistically managing his cow herd and land base near Center, Nebraska, and is a Holistic Management Certified Educator. The fifth course, in Bison, SD, was taught by Wayne Berry, Holistic Management Certified Educator, from Williston, ND. The location and attendance at the five sites were:

- Mobridge, SD - 24,
- Ipswich, SD – 35,
- Miller, SD - 36 ,
- Forestburg, SD – 26 and
- Bison, SD - 50.

Added to the 12 HRM workshops sponsored during the first project segment, attended by 345 participants, the cumulative total HRM sessions and attendance equals 21 and 759 respectively

Grazing Schools

The South Dakota Grazing School was developed and the first school held during 2003. The workgroup that developed the school and hosted the event included representatives from several natural resource agencies and organizations. Agencies and organization involved included the:

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

The goal statement established by the 2003 workgroup (see below) guided the school's curriculum through the 2006 event.

“Through an annual Grazing School provide grassland management training to grassland managers and grassland specialists to increase acres of sustainable grassland management resulting in the reduction of sediment, nutrient, and bacterial contamination of South Dakota waterbodies.”

During December 2006, the South Dakota grazing school instructors and the Grasslands Coalition Board met to review and improve the grazing school. An outcome of the meeting was a vision statement for the school:

“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.”

The committee also determined that speakers would be asked to submit an outline of their presentations so consistency could be maintained among the speakers and that presenters should be encouraged to be at the school as long as their schedule allows, thereby being available for further questions

To meet the needs of livestock producers and resource management agency personnel who attend the schools, the curriculum is evaluated and updated annually.

The importance of the school to ranchers and agencies that send their employees to the school are exemplified by the following:

- NRCS requires attendance for participation in the agency’s Grazing Sustainability Incentive Program (GSI),
- individuals who attended a school requested the addition of an alumni event to provide “graduates” with the opportunity to have the skills learned refreshed and acquire information to further improve their grazing management capabilities, and
- Attendance at the school has, with the exception of 2006, essentially equaled or exceeded the target level (Table 11).

Table 11. 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	September 2010	64
Total		247

The Sixth South Dakota Grazing School was held in Oacoma, SD, September 8-10, 2008. The school field site was relocated to Lower Brule Sioux Tribe Trust Land near Oacoma, SD. Twenty-seven grasslands managers participated in the two and one-half day school. Students learned pasture allocation (Figure 10), grassland and natural resources management, grazing and watering systems, year-long grazing and nutritional needs of livestock.



Figure 10. Grassland managers learn to use transects to determine available forage.

An alumni event was added to the 2008 grazing school. The grazing school committee invited Ray Bannister, Wibaux (pronounced Weebo) (Figure 11), from Montana, to speak to the group. Bannister has developed a unique grazing system which uses herd effect to promote forage health. Bannister is known for his “out of the box” approach to grazing management and for his humorous presentations.



Figure 11. Bannister addressing the South Dakota Grazing School Alumni Event.

Twenty-five school alumni and current grazing school participants and instructors attend the presentation.

The Seventh South Dakota Grazing School was held in Oacoma, SD, September 14 -16, 2009. Thirty grasslands managers participated in the two and one-half day school. Grassland managers learned pasture allocation (Figure 12), grassland and natural resources management, grazing and watering systems, year-long grazing, and nutritional needs of livestock. An alumni event was included in the 2009 school offering

Natural Resources Conservation Service (NRCS) of South Dakota has made attendance at the South Dakota Grazing School a requirement for participation in their Grazing Sustainability Incentive program (GSI). Because of increased attendance stemming from increased participation in GSI program, two grazing schools were held during 2010.



Figure 12. 2009 Grazing School students learn pasture allocation.

The grazing school alumni event was concurrent with the 2009 grazing school. Dr. Barry Dunn, then Executive Director King Ranch Institute of Ranch Management, now SDSU Dean of Agriculture, was the keynote speaker for the grazing school and a guest speaker at the alumni gathering. Twenty five alumni plus the current students and instructors attended the event.

Displays

The project's updated display was used at six events during the project period bringing the total events at which the display was used to 18 since it was developed during the initial project segment.

A cumulative list of the events at which the display was used to promote the project and managed grazing and summaries of selected events where used during this project segment follows (Table 12).

Table 12. Summary of Events at Which the Project Display was used.

Years	Event	Location	Estimated Booth Traffic/Attendance (Total all yrs.)
20021, 2002 and 2003	SD Cattleman's Assoc. Convention	Huron, SD	625
2002, 2004, 2005 and 2006	Black Hills Stock Show and Rodeo	Rapid City, SD	1,200,000
2002	SDACD Convention	Pierre, SD	296
	Rancher Workshops		
2002, 2007 and 2009		White River, S D	774
2002		Presho, SD	
2004		Mission, SD	
2004		Miller, SD	
2005		Vermillion, SD	
2003 and 2006	National GLI Convention	Nashville, TN & St. Louis, MI	2,100
2003 - 2010	Grazing School	Oacoma/Chamberlain, SD	247
2004 - 2005 and 2007	DakotaFest	Mitchell, SD	100,000
2008	SD Math/Science Teacher's Convention	Huron, SD	40
2008, -2009 and 2010	Washington Pavilion of Arts and Science Ag Day	Sioux Falls, SD	3,500
2009 and 2010	Beef Day at the Capital	Pierre, SD	600
Total			1,308,182

The Washington Pavilion of Arts and Science located in Sioux Falls, SD, an entertainment, cultural and educational facility hosts an Ag Day each year. The event highlights the role agriculture plays in the economy and people's everyday lives. During the event, exhibitors provide family oriented hands-on activities and education. During the 2008 and 2009 events, the project's display featured SD grasses.

In addition, at the 2008 and 2009 events, project staff provided display visitors an opportunity to complete the "Rangeland Café" and "Plant a Brand" activities (Figures 13a and 13b) included in the South Dakota Ag in the Classroom "Mother Nature's Recycling Machines" unit. When participating in the Rangeland Café activity, students guess which grass is ice cream and which broccoli to grazing animals. Plant a Brand includes drawing a livestock brand on construction paper applying glue to the brand and spreading grass seed over the glue. The students were encouraged to plant the "brand" once they arrived home. More than 1,500 individuals attended the 2008 event; 1,000 the 2009.



Figure 13. "Rangeland Cafe" activity at the 2008 Washington Pavilion Ag Day.



Figure 14. "Plant a Brand" activity at the 2009 Washington Pavilion Ag Day.

During March 2009, the South Dakota Cattlemen hosted Beef Day at the State Capitol in Pierre, SD, during the SD legislative session. NRCS, Ag in the Classroom, SD Cattlemen's Association, the SD Beef Industry Council and the South Dakota Grassland Coalition joined the event to share information about the state's beef industry and its importance it is to South Dakota's economy. Groups partnering with the cattlemen served beef tortilla roll-ups, beef jerky, "grass-fed beef" mini-hamburgers and over 400 beef salad silver dollar sandwiches to legislators and lobbyists.

Presentations

During project segment 2, project staff made 21 project related presentations (Table 13) to a total audience of 1,370 bringing the cumulative total presentations and audience to 35 and 2,075 respectively.

As most of the events at which many of the presentations were made were described previously in this section of the report, the descriptions of presentations listed in the table is limited to two selected to serve as examples of those not otherwise described.

A copy of the presentation made at the 2007 West River/Lyman-Jones Rural Water System annual meeting is profiled as an example of a presentation made by project staff. To review the presentation, see Appendix 5.

A presentation made at the 2007 South Dakota Cattlemen's Association convention by Gabe Brown serves as an example of a managed grazing related presentation sponsored by the project and SDGLC. Brown, a grazer and no-till farmer, uses cover crops for feed or grazing. To view Brown's presentation and the PowerPoint presentation given at the Society of Range Management July 2007 tour referenced previously click on the links that follow:

[Gabe Brown presentation at SD Cattlemen's Association Convention, Watertown, SD](#)

[Brown's PowerPoint presentation](#)

Publications/ News Articles

The project sponsor continued the use of print as a medium to convey information about managed grazing and opportunities for involvement in project activities. While the use of news releases was continued as mechanism conveying opportunities for involvement to a wider audience, the use of other publications was initiated to reach livestock producers, the projects primary customers.

The publications completed during project segment 2 include an insert in an industry weekly publication and publication in the. *Range & Pasture Journal*

Project staff and the South Dakota Grasslands Coalition Board of Directors were contacted by Trailhead Promotions, reporters for the *Cattle Business Weekly* during 2008. The firm proposed, that with financial assistance from the South Dakota Grasslands Coalition, writing a 12-16 page insert for distribution in an issue of *Cattle Business Weekly*. The insert, published in the March 2009 issue, included an article about the South Dakota Grasslands Coalition, a biography of the current SDGLC chairperson, a calendar listing pasture and range events, and grazing tips. A copy of the Range & Pasture Journal insert is located in Appendix 6.

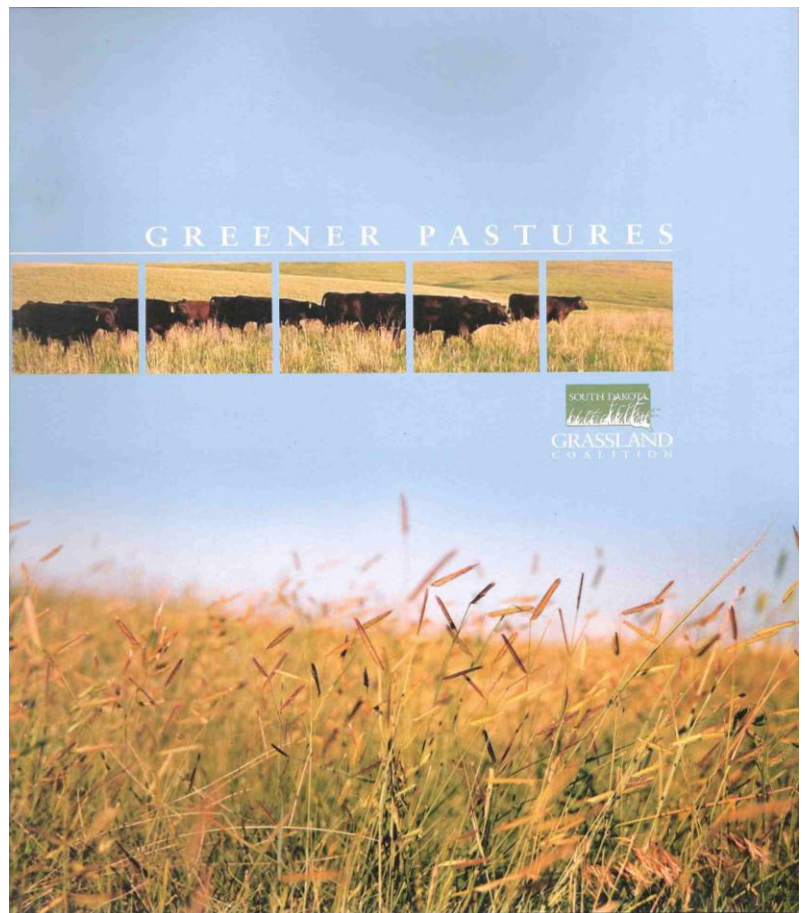
During 2010, South Dakota Grasslands Coalition partnered with the Nebraska Grazing Lands Coalition to publish the *Range & Pasture Journal*. Four issues have been published.

Table 13. Project Related Presentations.

Year	Event	Location	Attendance
2002	USDA-Forest Service Range Conservationists meeting	Pierre, SD	109
	South Dakota Association of Conservation Districts convention	Pierre, SD	40
	South Dakota Ornithological Society meeting	Rapid City, SD	40
	Tatanka RC&D meeting	Bison, SD	26
2003	Bootstraps meeting	Chamberlain, SD	20
2004	North Dakota/South Dakota Joint Projects Coordinator meeting	Bismarck, ND	20
	Bootstraps meeting	Highmore, SD	20
	South Dakota Project Coordinators meeting	Pierre, SD	25
	Lake Faulkton watershed meeting	Faulkton, SD	30
2005	Rancher's Workshop	Highmore, SD	30
	Rancher's Workshop	Gettysburg, SD	30
	Rancher's Workshop	Vermillion, SD	25
	Nonpoint Source Task Force meeting	Pierre, SD	40
2006	Bootstraps meeting	Oacoma, SD	55
2007	West River/Lyman Jones Rural Water Annual Meeting	Kadoka, SD	300
	SD Cattleman's Convention	Watertown, SD	25
	Provenza Workshop	Oacoma, SD	76
2008	HRM Workshops	Watertown	91
		Platte	45
		Parkston	52
	SD Math/Science Teacher's Convention	Huron, SD	40
2009	Gerrish Workshop	Oacoma, SD	54
	Gadzia Workshop	Oacoma, SD	56
	HRM Workshops	Mobridge	24
		Ipswich	35
		Miller	36
		Forestburg	26
		Bison	50
	Wildlife Society - SD Section	Oacoma	130
2010	HRM Workshop	Bison	50
	Pratt Workshop	Kadoka, SD	60
	Rancher's Workshop	Mission, SD	145
	Farm/Home Show	Webster, SD	35
	GLC Annual Meeting	Oacoma, SD	57
	Winter Range Camp	Isabel/Bison, SD	70
	Sisseton-Wahpeton Oyate Grazing Workshop	Sisseton, SD	53
Total	Innes Workshop	Chamberlain, SD	55
			2,075

The South Dakota Grasslands Coalition, in cooperation with its project partners, published *Greener Pastures* (Figure 14), a grazing guidebook during project segment 1. Sections included in the guide are:

- Why managed grazing?
- General principles
- Choosing a grass species
- Water quality
- Grazing riparian areas
- Native and introduced grasses
- Cool and warm season grasses
- Wildlife
- Grazing systems
- Designing a program
- When and how much to graze
- Monitoring success
- Demonstration sites
- Contact information



15. Greener Pastures.

Project staff continues to distribute copies of the guide at events such as grazing school, workshops, grassland and bird tours and to applicants for technical assistance.

The publication is also available upon request by contacting project staff at:

kyle.schell@sdstate.edu or

jjessop@sdconservation.org

News releases, articles and inserts about the project and project related activities have been printed by nearly 20 newspapers and agricultural trade papers with a combined circulation of more than 730,000 since the project was initiated during 2001. See Table 14 for a comprehensive list of the releases, articles and inserts. The month, publication, subject and circulation are included in the table.

Table 14. Project Related News Articles.

Date	Publication	Subject	Circulation
June 21, 2002	Tri-State Neighbor	Sip Tour	28,000
August 1, 2003	Charles Mix News	2003 Bus Tour	686
August 2, 2003	Gregory Times	2003 Bus Tour	2,132
August 3, 2003	Huron Plainsmen	2003 Bus Tour	6,000
August 4, 2003	Mitchell Daily Republic	2003 Bus Tour	12,447
August 5, 2003	Pierre Capitol Journal	2003 Bus Tour	3,979
August 6, 2003	Platte Enterprise	2003 Bus Tour	1,954
August 8, 2003	Sioux Falls Argus Leader	2003 Bus Tour	60,000
March 25, 2004	Dakota Farmer	Article About Lavern Koch & Mark Kieffer, SD Grasslands Board Members	30,000
July 26, 2005	Sioux Falls Argus Leader	2005 Bus Tour	60,000
September 1,	Beef Magazine	Amazing Grazing Efforts	100,000
April 22, 2006	Sioux Falls Argus Leader	Larry Wagner, Grass Fed Beef	60,000
May, 2006	Cattle Business Weekly	Changes for the Better	13,000
July, 2006	Sioux Falls Argus Leader	2006 Bus Tour	60,000
August, 2006	Tri-State Neighbor	2006 Bus Tour	28,000
August, 2007	Agweek	2006 Bus Tour	26,000
May, 2007	Cattle Business Weekly	NRCS Award	13,000
May, 2007	Farm Forum	NRCS Award	26,000
May, 2007	Farm Market News and Auctions	Organic Grass Feed Beef	3,126
June 2007	Cattle Business Weekly	2007 Bird Tour	13,000
August 2007	Cattle Business Weekly	Slovak Ranch Tour	13,000
June 2008	Aberdeen American News	Bird Tour at Peckham's	15,874
August 2008	Cattle Business Weekly	Range and Pasture Insert	13,000
October 2008	Stockman Grass Farmer	SDGLC Board Member article - Larry Wagner	11,000
November 2008	Dakota Farmer	SDGLC Board Member article - Larry Wagner	30,000
December 2008	Dakota Farmer	Pasture Management for horses	30,000
December 2008	Cattle Business Weekly	Range and Pasture Insert	13,000
January 2009	Cattle Business Weekly	Garza Presentation	13,000
March 2009	Cattle Business Weekly	Range and Pasture Insert	13,000
June 2009	Cattle Business Weekly	Range and Pasture Insert	13,000
June 2009	Dakota Farmer	Faulstich Receives ESAP Award	30,000
July 2009	Farm Forum	Faulstich Receives ESAP Award	36,345
September 2009	Tri-State Neighbor	Grazing School	28,000
January 2010	Successful Farming	Swath Grazing	440,000

Electronic Media

Radio

Eight radio project related interviews were broadcast since the project was initiated. Interviews completed during project segment 1 were:

- WNAX, Yankton -South Dakota Grassland Coalition chair Mark Sip,
- *Dakota Farm Talk* (aired on 12 stations) - Project Coordinator,
- KWYR, Winner - Project Coordinator discussing 2003 bus tour - ,
- KGFX, Pierre - Project Coordinator My Daily News discussing 2003 bus tour,
- KWYR, Winner,- Project Coordinator promoting 2006 bus tour,
- KWYR. Winner - Grazing school staff promoting the 2006 grazing school, and
- KGFX, Pierre (My Daily News) - South Dakota Grasslands Coalition's 2007 Excellence in Conservation Award.

Project related interviews and stories completed during project segment 2 included:

- Dakota Outdoors Radio - Project Coordinator interviewed about the 2009 Bird Tour,
- Brownfield Network – Audio clip about Faulstich 2009 ESAP Award , and
- American Ag Network - Audio clip about Faulstich 2009 ESAP Award.

Market share for Dakota Outdoors and Brownfield Network are estimated as 36,435 and 9,000 respectively; combined share = 45,435. Market share for the American Ag Network was not available.

Television and Training Video

During project segment 2, three television programs with a combined market share of approximately 760,000 viewers featured project related activities. The programs and viewers were:

- 2007 grazing school – Today's Ag and Ag Day/US Farm Report with 10,000 and 700,000 viewers respectfully, and
- 2009 ESPA Award to Faulstich family – Cattlemen to Cattlemen – RFD TV - 48,000 viewers.

A five segment program was produced for and aired on television (*Today's Ag*) during project segment 1. The segments were used to produce an informational / training video. The program was aired on November 7 and 14, 2004 (approximately 90,000 viewers each segment). Five hundred videos and 500 DVDs were produced using tape shoot to produce the program segments. Copies of the videos were sent to 77 NRCS offices, conservation district offices and 95 vocational agricultural teachers in the state. NRCS shows the video in their introductory range planning class.

The video provides the livestock industry and general public with information about managed grazing and how the practices protect the environment while improving producer profitability. The video may be viewed by clicking on "Grassland Management Video" after accessing:

<http://www.sdgrass.org/ItemsOfInterest/grasslands.mp4>

A summary of outreach activities completed during project segment 2 with a comparison of the purpose for the activity versus the result is shown in Table 15.

Table 15. Summary of Outreach Activities.

Activity	Coverage/Distribution	Purpose	Result
Existing Demonstration sites	Sites at Highmore and Geddes maintained;	Continue to showcase grazing alternative and promote project involvement	Continue opportunities for project outreach through tours and the media, i. e. Dakota Outdoors Radio.
New demonstration and Riparian site	Southeastern SD	Expand opportunities for livestock producer to visit a system and highlight grazing impacts and riparian management	New demonstration site in eastern SD; Data acquired to evaluate grazing impacts on vegetation and NPS.
Website	State Wide	Project awareness	Project awareness increased; recognition of SDGLC as the voice for grazing lands in SD; SDGLC invited to join Ag Unity .
Display Board	Shows and workshops	To highlight Project and Coalition activities	Display used at 11 events – 7 by project 4 by NRCS.
Grazing School	Statewide	Grass management ideas and networking worth other producers and grass managers	78 Systems installed or improved
Print and Electronic Media	Statewide	Project awareness & happenings	Increased project awareness and attendance at project sponsored events such as tours and grazing schools which resulted in development of grazing systems and installation of grazing related practices/BMPs.
Tours	Statewide	Increase project awareness, ownership, support, and participation; availability of cost share for BMP installation	Antidotal information indicates a positive effect relative to increasing participation in other project sponsored events or the installation of grazing practices.

Objective 3: Monitor and evaluate the two on-ranch demonstrations, two riparian demonstration sites, complete the load reduction study, and provide for the day-to-day project administration and project management to complete project goal, objectives, tasks, and products by July 1, 2009.

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

The management agreement with SDACD initiated during 2001 was continued through the project period. Under terms of the agreement, SDACD provides administrative, financial, and personnel management services. A project advisory committee with representation from each party to the agreement meets periodically to review project progress, rank requests for assistance, and provide direction to the Association.

The functions of the advisory committee formed during project segment 1 to keep the coalition's project partner agencies and organizations apprised of project activities, recommend future activities and coordinate joint efforts was assumed by the coalition board of directors during project segment 2. The decision to accomplish the committee functions in this manner was made based on several considerations which were all related to the questionable need to bring the group together for a meeting to discuss what had already been accomplished at another meeting involving the same organizations and agencies. Examples of such meetings are the partner's meetings hosted by the NRCS state director and meetings of the grazing school planning group.

Milestones:

Project Segment 2- Planned – Hire and supervise employees and consultants.

- Accounting completed to meet federal grant requirements
- 2 mid-year project progress reports (April 08, and April 09).
- 2 Annual project progress reports (October 07, October 08).
- 1 Final project progress report (July 2009).

Accomplished - Employees and consultants hired and supervised.

- Accounting completed and requirements met as notified by DENR and the grant agreement.
- 4 Annual project progress reports completed (October 2007, 2008, 2009, 2010).
- 1 Final project report completed (August 2011).

Task 5: Complete the monitoring of the three on-ranch rotational grazing system demonstrations, the two on-ranch grassland riparian demonstrations, and monitor vegetation and infiltration on 60 cooperating ranches for input and validation of the Annualized Agricultural Nonpoint source (AnnAGNPS) model to estimate load reductions, provide vegetation data for EROS for remote sensing capabilities, and complete written reports on evaluating efforts.

Product 8: Complete monitoring of the on-ranch rotational grazing demonstrations and riparian grassland on-ranch demonstrations.

Monitoring was accomplished by seasonal employees, the project coordinator, and SDSU range department staff. See Products 3 and 9 and Appendices 1 and 2 for information regarding amendment of Task 5 related products

Milestones:

Project Segment 2 – Planned - Data collected through monitoring of the two grassland riparian area on-ranch demonstration sites, and evaluated to include a written report by a certified range specialist. Data collected through monitoring on the three rotational grazing demonstration sites, and evaluated to include a written report by a certified range specialist.

Accomplished - See Products 3 and 9

Product 9: Complete monitoring of the on-ranch vegetation and infiltration sites used to develop the AnnAGNPS model for making estimations of sediment, N, and P load reductions.

Monitoring was completed under the leadership of SDSU Plant Science Department and Animal and Range Science Department faculty, the outreach coordinator, research associate, and student hourly employees. The SDSU team collected Cornell sprinkle infiltrometer measurements with the vegetation data on the on-ranch sites. The infiltrometer measurements were correlated with small plot sprinkle runoff, sediment, N, and P measurements with this and other 319 projects. Water quality samples collected from these measurements were analyzed at SDSU laboratories.

The amended monitoring plan follows.

Western South Dakota Riparian demonstration site

In partnership with USFS and others, SDSU is a participant a cottonwood revegetation project on the Lower Grand River north of Bison, SD. Livestock impacts on vegetation and cottonwood survival from off-site watering points and watering from the river will be compared. Visual obstruction measurements and cottonwood sapling counts will be made each year to determine the effects of grazing and watering source. Samples will be collected in the fall of each year during the project period.

Eastern South Dakota Riparian demonstration sites

Several riparian pastures that differ in management practices will be monitored. The management practices vary from total exclusion, rotational grazing, and continuous grazing. Visual obstruction measurements using the Robel pole technique will be made several times during the grazing season on each site. Infiltration, runoff and sediment yield will be measured at each site using the Cornell sprinkler infiltrometer technique. Water quality samples will also be collected and analyzed for phosphorus. Vegetation parameters such as plant height, vegetative cover, litter cover, and aboveground biomass will also be measured.

Eastern South Dakota Riparian research sites

Infiltration, runoff, sediment yield, and vegetation parameters from riparian pastures that differ in grazing management from poor to excellent condition will be monitored. Sampling will be accomplished working cooperatively with the SDSU researchers who are documenting stream

characteristics and water quality at 60 sites in eastern SD. The cooperative effort will facilitate identifying relationship between upland infiltration and vegetation with stream characterization and water quality data. The data will be used to develop AGNPS models for these small watersheds.

All data collection was completed during the 2008 and 2009

AGNPS modeling planned as a cooperative activity with DENR was not completed during the project period.

Milestones:

Project Segment 2 – Planned -Vegetation data and infiltration data collected by NRCS NRI and SDSU team at 30 locations each year.

Training on AGNIPS for SDSU soils research associate by SD DENR staff during first year.

Collection of runoff and sediment and analyzing for N and P each year at the RESPEC sites on the Belle Fourche watershed district. Running model simulations with first year's vegetation data and validation through runoff and sediment collected at the RESPEC sites

Estimate sediment, N, and P load reductions from AnnAGNPS of the 570,000 planned acres by the past and current Grassland and Planning project.

Accomplished –See Product 3 and Appendices 1 and 2

MONITORING AND EVALUATION

Project monitoring will be completed by a team consisting of:

- the project coordinator,
- seasonal employees and/or interns working during the summer,
- grassland managers/producers,
- SDSU, Animal and Range Science Department staff (Outreach Coordinator) and
- 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. Water quality data was forwarded to DENR or the volunteer monitoring program for entry in the STORET database. QAQC for all water quality monitoring aspects of the project will be provided by DENR.

The information collected was used by the SD Grassland Coalition to complete mid –year (April) and annual (October) reports of project activities, provide a copy to all project partners and funders and prepare the final report.

Mid-year reports included current activities and an evaluation relative to project milestones, as well as cumulative progress toward reaching the project goal.

Evaluation of success in reaching the project goal was accomplished by monitoring project activities to measure:

- meeting established milestones,
- effects on water quality and vegetation parameters, and
- contributions to improving sustainability of grassland managers operations.

Overall, project success was evaluated based on the monitoring data as an indicator of grassland improvement as an effective BMP to protect/improve water quality and the profitability of the owner's operation.

Monitoring Activities

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

- number of on-farm visits and landowner/operator contacts – 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 and demonstrations sites 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.

Water quality, vegetation soil characteristics and litter and were monitored at five sites in eastern SD; two in western. See Appendices 1 and 2 for location and data.

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 nature groups such as the Leopold foundation and Ornithologists, and
- managed grazing practices reduce NPS pollution to surface waterbodies.

See next section for load reduction information.

Data collected at riparian demonstration sites in eastern and western South Dakota 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 gulley 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 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 realized from the systems grazing installed (Table 16) 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 16. Load Reductions Realized From Grazing Systems Installed.

NPS Pollutant	Load Reduction	
	Project Segment 2	Cumulative
Nitrogen	142,723	309,697
Phosphorus	23,765	55,992
Sediment	13,153	32,637

TMDL watershed assessment and implementation projects (HUC 12 name) provided load reduction data included:

- Lower West Fork Elm Creek
- Johnny Creek-White River
- Deer Creek-Belle Fourche River
- Upper Hermaphrodite Creek
- Center Pearl Creek
- Lower Fourmile Creek
- Duck Creek
- Jamesville Colony-James River
- Lower South Chapelle Creek
- Mule Creek
- Upper Spring Creek
- Powell Creek
- Alkali Creek
- Kennebec Lake-Medicine Creek
- Park Slough
- Spring Creek-Red Owl Creek
- Deer Creek-Belle Fourche River
- Lower Shaefer Creek

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 and
- 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 environmental organization such as the teachers, birders, wildlife community.

RELATIONSHIP TO MANAGEMENT PLAN

Activities completed during the project period supported attaining the goal of the SD NPS Program as outlined in the SD NPS Management Plan. Examples of support provided by the Segment 2 and the cumulative activities of all project segments of the Grazing Management and Planning Project include but are not limited to the following SD NPS Management Tasks:

Task 4 – Implement TMDLs within two years of completion.

The Grassland Management and Planning Project is a statewide effort that provides grazing management BMPs planning and implementation assistance in watersheds where TMDLs are being implemented and developed. The technical assistance and outreach activities provided by the Grasslands project is a resource local TMDL project planners and implementation coordinators can use to move their projects toward completion within the two year window.

- Tasks 5 – Maintain working relations with financial and technical assistance partners.

The project PIP is structured to promote the development and use of partnerships that include resource management agencies, industry and environmental organizations and the academic community to include the cooperative extension service to plan and implement BMPs.

- Task 8 – Implement clusters of TMDLs on a 12 or 8 digit Hydrologic Unit Codes (HUCs).

The project provides services across eight digit Hydrologic Unit (HUC) boundaries regardless of size. Therefore, the project supports the implementation of TMDLS in 8 and 12 digit clusters.

- Task 10 – Implement multiple TMDLs for several waterbodies across county and conservation district boundaries using financial and technical assistance from federal, state and local project partners to expand the TMDL implementation capabilities of the SD NPS Program.

The Grassland Management and Planning Project implemented grazing management BMPs in 36 counties in partnership with local, state and federal agencies and organizations. (See Tables 1, 2, 4 and 5).

- Task 12 – Develop and implement an outreach program that provides information and participation opportunities through partnership.

The project implemented an outreach and education program (Table 14) that resulted in acceptance of managed grazing as BMP livestock producers can use to

reduce NPS pollution while increasing profitability. The program has gained recognition of environmental organizations as a program that provides habitat for game and nongame species.

- Task 14. –Annual GRTS reports with load reduction data.

GRTS reports with load reduction data were provided to DENR for use in meeting 319 Program reporting requirements. The reductions were calculated using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL)

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,
- Lower Brule Sioux Tribe (Grazing School location) and
- Crow Creek Sioux Tribe (grazing system development on lease land).

See Table 17 for a more 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 information transfer program (Objective 2). The activities included:

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

Refer to Tables 9 – 15 for summaries of the activities listed above.

Table 17. 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.
Governmental	
Local	
Moody, Brule, Faulk American Creek 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	
North Central RC&D	Funds to purchase grazing sticks.
Crow Creek Sioux Tribe	Project participation
Lower Brule Sioux Tribe	Grazing School Field Exercise Location.
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

There were several challenges encountered with maintaining the demonstration sites. While the producers offering the use of their operation for the sites were initially enthusiastic and actively involved, commitment of several of the cooperators waned when student interns were not available to assist with the monitoring activities. Much of the difficulty with hiring interns was attributed; in part, to lack of continuity of SDSU liaison staff tasked with hiring and supervising student interns.

The challenges referenced above required amending the monitoring plan.

Recommendations

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

- Persons attending the grazing school uniformly recommended continuing the activity and indicated they would encourage others to attend.
- The project conducted twice as many tours as planned with double the attendance.
- Workshops tripled from what was planned with triple the planned attendance.
- During the initial stages of the project, i. e. 2002, it was necessary to solicit producer participation whereas as the project matured toward the end of Project segment 1 and during the Segment 2 project period, unsolicited producer requests for assistance and attendance at outreach events often exceeded expectations and often capacity to provided 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 twice during the project period. The first amendment was made to reflect changes in the PIP with respect to demonstration site establishment and monitoring... The second budget amendment increased the project grant award by \$18,000 to provide additional funding to cover the costs associated with hiring rangeland consultants needed to accommodate the requests for assistance for the project beyond the anticipated level.

The budget as amended with a comparison to actual expenditures appears in Table 18.

Table 18. Project Budget - Expenditures Comparison.

Item	Budget		Total Expenditure	Match Non Federal	Other Federal	319
	Original	Amended				
Personnel						
Range Specialist/Project Coordinator salary & benefits	\$107,062	+ \$61,472	\$168,534		\$14,587	\$153,947
Range Specialist/ Planning & Implementation & benefits	\$70,000	+ \$42,356	\$112,356		\$9,725	\$102,631
Range Consultant - contractual	\$55,000	+ \$30,369	\$85,369			\$85,369
Outreach Coordinator/ Information Specialist (SDSU)	\$30,625	+ \$12,711	\$43,336			\$43,336
Research Associates (SDSU)	\$21,467	(- \$21,467)	\$0			0
(2) Undergraduate Students (SDSU)	\$25,600	(- \$25,600)	\$0			0
SDSU Benefits for Employees	\$18,342	(- \$5,780)	\$12,562			\$12,562
SDSU Indirect Costs - Salaries	\$24,969	(- \$5,192)	\$19,777			\$19,777
SDSU Facility Salary In-Kind Match	\$100,152	(- \$54,336)	\$45,816	\$45,816		0
Seasonal Employees/Interns	\$10,000	(-\$9,313)	\$687			\$687
Administrative Staff						
Support Staff	\$2,000	(- \$2,000)	\$0			0
Project Work Group: Grassland Coalition	\$2,000	+ \$37,487.82	\$39,487.82	\$39,487.82		0
State: GF&P, DOA	\$4,000	(- \$4,000)	\$0			0
Federal: NRCS, SDSU, USF&WS	\$4,000	(- \$4,000)	\$0			0
Private: DU, Ranchers	\$1,000	(-\$ 1,000)	\$0			0
Project Administration						
General Liability	\$1,000	+ \$1,207	\$2,207			\$2,207
Audit	\$1,500	(- \$1,500)	\$0			0
Endangered Species / Cultural Surveys	\$2,000	(- \$2,000)	\$0			0
Office Supplies/Operation						
Supplies	\$7,500	(- \$5,989)	\$1,511			\$1,511
Postage	\$250	+ \$619	\$869			\$869

Table 18 Continued

Item	Budget Original	Budget Adjustment	Total Expenditure s	Match Non Federal	Other Federal	319
Cell Phone	\$1,250	+ \$1,530	\$2,780			\$2,780
Computer Maintenance/Lease	\$1,400	+ \$4,000	\$5,400			\$5,400
Computer Software	\$600	(- \$600)	\$0			0
Office Space		+ \$1,153	\$1,153			\$1,153
Travel						0
Vehicle Lease	\$7,500	+ \$15,600	\$23,100			\$23,100
Vehicle Mileage	\$6,400	+ \$12,776	\$19,176		\$491	\$18,685
Vehicle Insurance	\$1,750	+ \$3,018	\$4,768			\$4,768
Lodging / Meals	\$900	+ \$2,962	\$3,862		\$58	\$3,804
SDSU Travel / Lodging / Meals	\$24,000	(-\$24,000)	\$0			0
SDSU Indirect costs for Travel	\$6,240	+ \$805	\$7,045			\$7,045
Subtotal Personnel, Administration, supplies, Travel						0
Rotational Grazing Plans Implemented	\$288,500	(- \$126,844.06)	\$161,655.94	\$161,655.94		0
Maintain 2 and Establish 1 New Demonstration	\$17,150	(-\$17,150)	\$0			0
Riparian Demonstration Sites	\$21,650	(-\$21,650)	\$0			0
Website/Grassland Display	\$2,500	(- \$1,640)	\$860			\$860
Radio Ads, Tours Workshops, Grazing Schools, News Releases	\$54,500	+ \$73,356.45	\$127,856.45	\$103,819.45		\$24,037
Reports/Project Management	\$21,875	(-\$5,570)	\$16,305			\$16,305
Monitoring	\$9,710	(-\$9,674)	\$36			\$36
Modeling SDSU	\$11,340	(-\$11,340)	\$0			0
Match from Range Consultants			\$0			0
Subtotal Activities						
Total	\$965,732	(- \$59,223)	\$906,509	\$350,779	\$24,861	\$530,870

CONCLUSIONS

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

- project milestones, except as noted, were met or exceeded, (see Table 19 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 practice by conservation nature groups such as the Leopold foundation and Ornithologist, and
- managed grazing practices
 1. entice livestock to drink from sources other than the riparian area,
 2. reduce NPS pollution to surface waterbodies, and
 3. improve the ecological status of range and pasture lands (=range condition).

Table 19. Comparison of Planned vs. Accomplished Milestones.

Milestone	Planned		Accomplished	
	Segment 2	Cumulative	Segment 2	Cumulative
Planning of grassland management systems	60,000	210,000	167,995	550,000
Implementation of grasslands management systems	120,000	450,000	165,995	547,526
Fence	100,000	205,000	128,635	459,850
Pipeline	80,000	130,000	104,476	396,080
Wells	0	10	4	5
Tanks	25	55	39	148
Dugouts/dams	2	12	6	6
Grass seeding	100	350	505	732
Demonstration sites	3	9	3	12
Web site & hits	30,000	80,000	112,686	293,092
Tours/participation	6/NA	19/NA	16/833	47/
Media events	4	19	21	75
Video	1	1	0	1
Workshops/participants	6/NA	9/NA	26/1,256	53
Grazing schools/participants	2/50	6/150	3/118	8/247
Administration & oversight	1	2	1	2

The project goal was attained.

APPENDIX 1

**319 Non-point Source Pollution Program
Eastern South Dakota Riparian Demonstration Project
South Dakota State University
2008 Report
Alexander J. Smart**

Vegetation use of riparian pastures

Seven riparian pastures along tributaries of the Big Sioux River in eastern South Dakota were monitored for the impact of livestock grazing on litter cover, vegetative cover, plant height, and visual obstruction measurements. Transects running parallel to streams at a distance of 5, 25, 50, 75, and 100 m away from the streams were established at 3 to 4 sites per pasture. All sites were monitored in spring (June) and late summer (August) of 2008. Three of the sites were rotationally grazed and 4 sites were continuously grazed. Table 1 and 2 describes the effect of livestock distribution across the pasture as a function of transect distance from the stream in the spring and summer. Plant height and visual obstruction were significantly different at distances from the stream. These data show that cattle did not overgraze the areas adjacent to the stream (5 m away), but tended to graze more between 25 and 50 m away from the stream. There were no differences in percent litter or vegetative cover at different distances away from the stream. The cover of litter and vegetation was higher as the season progressed (Tables 1 and 2). There was no difference in any of the measurements between rotational grazing and season long continuous grazing systems. This was likely due to the fact that pasture size at these locations were generally less than 100 acres and distances to water or other parts of the pasture was never greater than 0.5 miles.

Runoff and sediment yield

Sprinkle infiltrometer measurements were made during the summer of 2007 and 2008 at two western and five eastern sites in South Dakota. Runoff and sediment yield were estimated using a Cornell sprinkle infiltrometer (Fig. 1). Infiltration runs were made on dry field conditions. Rate of application was approximately 0.5 cm/min for 45 minute runs. This was equivalent to applying at a rate of 11.8 inches/hr. Additional vegetation measurements of plant height, vegetative cover, litter cover, and vegetative weight were made for the modeling purposes. Soil moisture, bulk density, and slope also were made. Average runoff ranged from 0.08 cm/min at Summit to 0.36 cm/min at Sturgis (Table 3). Average sediment yield was greater for the two western South Dakota sites compared to the five eastern sites. This was supported by the fact that vegetative and litter cover tended to be less at sites from the mixed-grass prairie in western South Dakota compared to tallgrass prairie sites in eastern South Dakota. In addition, western South Dakota sites were comprised of clayey or dense clay ecological sites compared to silty and thin upland ecological sites in the east which would have coarser soil textures.

These infiltration runs would mimic intense, short-lived rainfall events. The fact that very little sediment yield was produced from the eastern South Dakota sites suggests that erosion from these grasslands is actually quite low. Sedimentation of streams feeding into the Big Sioux River would more likely be due to the process of natural stream bank erosion or sediment entering the stream from hoof action of livestock activity and not from overland flow. In western South Dakota, sedimentation of streams could come from soil erosion from uplands as indicated by our sediment yield estimates.

Another mechanism of sediment loadings that our measurements technique does not explain is the process of overland flow resulting in gully formation. During intense rainfall events, overland flow could create cutting and gulley erosion. At the high experimental application rates, 66 and 72% of the water applied ran off at Cottonwood and Sturgis, respectively. At the eastern South Dakota locations, runoff rate accounted for 16 to 64% of the application rate.

Conclusion

These data suggest that livestock grazing of riparian pastures in eastern South Dakota, does not impact sediment loading from the surrounding uplands. Use of vegetation was fairly even across the pasture as indicated from the vegetation measurements at different distances from the stream. Since riparian pasture size was relatively small at the eastern South Dakota locations, livestock distribution was even. Cattle tend to not overgraze near the stream. One reason might be the fact that 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.

Table 1. Litter cover, vegetative cover, plant height, and visual obstruction measured at seven sites in eastern South Dakota, June 2008.

	Distance from stream (m)				
	5	25	50	75	100
Litter, %	27.9	28.2	29.0	30.3	30.8
Vegetative cover, %	45.2	43.1	40.1	42.7	48
Plant height, cm	13.5 a	11.4 b	12.0 ab	13.1 ab	14.5 a
Visual obstruction, cm	10.3 a	8.7 b	9.1 b	10.1 a	10.7 a

^{a,b}Means followed by a similar letter are not significantly different ($P>0.05$).

Table 2. Litter cover, vegetative cover, plant height, and visual obstruction measured at seven sites in eastern South Dakota, August 2008.

	Distance from stream (m)				
	5	25	50	75	100
Litter, %	72.6	73.6	77.1	75.9	78.4
Vegetative cover, %	59.6	55.9	57.9	59.8	63.4
Plant height, cm	13.8	11.1	13.2	14.6	15.0
Visual obstruction, cm	11.9 ab	10.6 b	11.2 b	13.1 a	13.8 a

^{a,b}Means followed by a similar letter are not significantly different ($P>0.05$).

Table 3. Summary statistics of runoff, sediment yield, vegetation and soil parameters adjusted to a constant sprinkler application rate of 0.5 cm/min.

Site	Parameter	Mean	Stdev	Min	Max
Brookings	runoff (cm/min)	0.11	0.07	0.02	0.24
n=24	sediment (kg/ha)	13.01	18.73	0.14	65.88

	Plant height (cm)	27.96	17.13	7.00	50.00
	Veg cover (%)	62.71	19.89	25.00	95.00
	Litter cover (%)	78.33	16.53	15.00	95.00
	Veg weight (g/0.25m ²)	57.00	28.47	19.50	115.60
	Bulk density	1.32	0.09	1.22	1.62
Cottonwood	runoff (cm/min)	0.33	0.08	0.11	0.43
n=34	sediment (kg/ha)	333.22	615.34	0.43	2882.98
	Plant height (cm)	16.65	8.40	3.00	30.00
	Veg cover (%)	31.26	13.44	15.00	60.00
	Litter cover (%)	53.88	26.59	12.00	95.00
	Veg weight (g/0.25m ²)	23.76	8.99	6.65	38.61
	Bulk density	1.31	0.13	1.07	1.60
Clear Lake	runoff (cm/min)	0.32	0.09	0.08	0.47
n=32	sediment (kg/ha)	40.81	46.92	4.07	200.97
	Plant height (cm)	15.53	7.04	6.00	33.00
	Veg cover (%)	27.59	10.32	15.00	65.00
	Litter cover (%)	81.44	25.29	10.00	98.00
	Veg weight (g/0.25m ²)	33.29	20.22	9.06	86.31
	Bulk density	1.13	0.20	0.10	1.25
Colman	runoff (cm/min)	0.27	0.14	0.00	0.48
n=46	sediment (kg/ha)	62.64	76.04	0.00	268.36
	Plant height (cm)	8.79	5.59	3.00	25.00
	Veg cover (%)	51.52	19.60	20.00	85.00
	Litter cover (%)	63.91	32.53	15.00	100.00
	Veg weight (g/0.25m ²)	32.21	23.75	3.60	86.87
	Bulk density	1.18	0.08	1.01	1.34
Aurora	runoff (cm/min)	0.25	0.14	0.01	0.47
n=41	sediment (kg/ha)	77.51	91.80	0.00	467.10
	Plant height (cm)	12.35	7.50	3.00	28.00
	Veg cover (%)	39.66	16.36	15.00	85.00
	Litter cover (%)	74.10	21.61	15.00	100.00
	Veg weight (g/0.25m ²)	33.22	22.51	4.22	80.37
	Bulk density	1.39	0.13	0.89	1.62
Sturgis	runoff (cm/min)	0.36	0.09	0.10	0.46
n=24	sediment (kg/ha)	706.83	1070.03	2.13	4939.88

	Plant height (cm)	23.00	6.52	13.00	35.00
	Veg cover (%)	39.92	15.26	15.00	70.00
	Litter cover (%)	27.00	34.81	1.00	90.00
	Veg weight (g/0.25m ²)	47.83	23.63	20.50	104.55
	Bulk density	1.50	0.12	1.28	1.70
Summit	runoff (cm/min)	0.08	0.09	0.00	0.34
n=28	sediment (kg/ha)	25.58	30.71	0.00	135.18
	Plant height (cm)	18.07	6.43	4.00	27.00
	Veg cover (%)	38.96	18.72	15.00	85.00
	Litter cover (%)	84.04	17.24	40.00	98.00
	Veg weight (g/0.25m ²)	40.30	23.74	12.75	94.00
	Bulk density	1.08	0.09	0.88	1.32



Figure 1. Cornell sprinkler infiltrometer.

APPENDIX 2

RIPARIAN DEMONSTRATION SITES

Modification to the riparian demonstration project as part of the Grasslands Project Monitoring Plan was necessary because of discontinued producer involvement. We modified the eastern South Dakota riparian site project to include a set of riparian pastures where we measured vegetation structure, infiltration and runoff using a sprinkler infiltrometer, and collected water quality samples at points up and downstream of land ownership during two high flow events in 2008.

The western South Dakota demonstration site included a comparison of vegetation structure measured along the lower branch of the Grand River on two US Forest Service allotments where one pasture had an alternative water source and the other did not.

RESULTS

Vegetation use of riparian pastures

Seven riparian pastures along tributaries of the Big Sioux River in eastern South Dakota were monitored for the impact of livestock grazing on litter cover, vegetative cover, plant height, and visual obstruction measurements. Transects running parallel to streams at a distance of 5, 25, 50, 75, and 100 m away from the streams were established at 3 to 4 sites per pasture. All sites were monitored in spring (June) and late summer (August) of 2008. Three of the sites were rotationally grazed and 4 sites were continuously grazed. Tables 1 and 2 describe the effect of livestock distribution across the pasture as a function of transect distance from the stream in the spring and summer. Plant height and visual obstruction were significantly different at distances from the stream. These data show that cattle did not overgraze the areas adjacent to the stream (5 m away), but tended to graze more between 25 and 50 m away from the stream. There were no differences in percent litter or vegetative cover at different distances away from the stream. The cover of litter and vegetation was higher as the season progressed (Tables 1 and 2). There was no difference in any of the measurements between rotational grazing and season long continuous grazing systems. This was likely due to the fact that pasture size at these locations were generally less than 100 acres and distances to water or other parts of the pasture was never greater than 0.5 miles.

Table 1. Litter cover, vegetative cover, plant height, and visual obstruction measured at seven sites in eastern South Dakota, June 2008.

	Distance from stream (m)				
	5	25	50	75	100
Litter, %	27.9	28.2	29.0	30.3	30.8
Vegetative cover, %	45.2	43.1	40.1	42.7	48
Plant height, cm	13.5 a	11.4 b	12.0 ab	13.1 ab	14.5 a
Visual obstruction, cm	10.3 a	8.7 b	9.1 b	10.1 a	10.7 a

^{a,b}Means followed by a similar letter are not significantly different ($P>0.05$).

Table 2. Litter cover, vegetative cover, plant height, and visual obstruction measured at seven sites in eastern South Dakota, August 2008.

	Distance from stream (m)				
	5	25	50	75	100
Litter, %	72.6	73.6	77.1	75.9	78.4
Vegetative cover, %	59.6	55.9	57.9	59.8	63.4
Plant height, cm	13.8	11.1	13.2	14.6	15.0
Visual obstruction, cm	11.9 ab	10.6 b	11.2 b	13.1 a	13.8 a

^{a,b}Means followed by a similar letter are not significantly different ($P>0.05$).

Runoff and sediment yield

Sprinkle infiltrometer measurements were made during the summer of 2007 and 2008 at two western and five eastern sites in South Dakota. Runoff and sediment yield were estimated using a Cornell sprinkle infiltrometer (Fig. 1). Infiltration runs were made on dry field conditions. Rate of application was approximately 0.5 cm/min for 45 minute runs. This was equivalent to applying at a rate of 11.8 inches/hr.



Figure 1. Cornell sprinkler infiltrometer

Additional vegetation measurements of plant height, vegetative cover, litter cover, and vegetative weight were made for the modeling purposes. Soil moisture, bulk density, and slope also were made. Average runoff ranged from 0.08 cm/min at Summit to 0.36 cm/min at Sturgis (Table 3). Average sediment yield was greater for the two western South Dakota sites compared to the five eastern sites. This was supported by the fact that vegetative and litter cover tended to be less at sites from the mixed-grass prairie in western South Dakota compared to tallgrass prairie sites in eastern South Dakota. In addition, western South Dakota sites were comprised of clayey or dense clay ecological sites compared to silty and thin upland ecological sites in the east which would have coarser soil textures.

Table 3. Summary statistics of runoff, sediment yield, vegetation and soil parameters adjusted to a constant sprinkler application rate of 0.5 cm/min.

Site	Parameter	Mean	Stdev	Min	Max
Brookings	runoff (cm/min)	0.11	0.07	0.02	0.24

n=24	sediment (kg/ha)	13.01	18.73	0.14	65.88
	Plant height (cm)	27.96	17.13	7.00	50.00
	Veg cover (%)	62.71	19.89	25.00	95.00
	Litter cover (%)	78.33	16.53	15.00	95.00
	Veg weight (g/0.25m ²)	57.00	28.47	19.50	115.60
	Bulk density	1.32	0.09	1.22	1.62
Cottonwood n=34	runoff (cm/min)	0.33	0.08	0.11	0.43
	sediment (kg/ha)	333.22	615.34	0.43	2882.98
	Plant height (cm)	16.65	8.40	3.00	30.00
	Veg cover (%)	31.26	13.44	15.00	60.00
	Litter cover (%)	53.88	26.59	12.00	95.00
	Veg weight (g/0.25m ²)	23.76	8.99	6.65	38.61
Clear Lake n=32	Bulk density	1.31	0.13	1.07	1.60
	runoff (cm/min)	0.32	0.09	0.08	0.47
	sediment (kg/ha)	40.81	46.92	4.07	200.97
	Plant height (cm)	15.53	7.04	6.00	33.00
	Veg cover (%)	27.59	10.32	15.00	65.00
	Litter cover (%)	81.44	25.29	10.00	98.00
Colman n=46	Veg weight (g/0.25m ²)	33.29	20.22	9.06	86.31
	Bulk density	1.13	0.20	0.10	1.25
	runoff (cm/min)	0.27	0.14	0.00	0.48
	sediment (kg/ha)	62.64	76.04	0.00	268.36
	Plant height (cm)	8.79	5.59	3.00	25.00
	Veg cover (%)	51.52	19.60	20.00	85.00
Aurora n=41	Litter cover (%)	63.91	32.53	15.00	100.00
	Veg weight (g/0.25m ²)	32.21	23.75	3.60	86.87
	Bulk density	1.18	0.08	1.01	1.34
	runoff (cm/min)	0.25	0.14	0.01	0.47
	sediment (kg/ha)	77.51	91.80	0.00	467.10
	Plant height (cm)	12.35	7.50	3.00	28.00
Sturgis n=24	Veg cover (%)	39.66	16.36	15.00	85.00
	Litter cover (%)	74.10	21.61	15.00	100.00
	Veg weight (g/0.25m ²)	33.22	22.51	4.22	80.37
	Bulk density	1.39	0.13	0.89	1.62
	runoff (cm/min)	0.36	0.09	0.10	0.46
	sediment (kg/ha)	706.83	1070.03	2.13	4939.88
	Plant height (cm)	23.00	6.52	13.00	35.00

	Veg cover (%)	39.92	15.26	15.00	70.00
	Litter cover (%)	27.00	34.81	1.00	90.00
	Veg weight (g/0.25m ²)	47.83	23.63	20.50	104.55
	Bulk density	1.50	0.12	1.28	1.70
Summit n=28	runoff (cm/min)	0.08	0.09	0.00	0.34
	sediment (kg/ha)	25.58	30.71	0.00	135.18
	Plant height (cm)	18.07	6.43	4.00	27.00
	Veg cover (%)	38.96	18.72	15.00	85.00
	Litter cover (%)	84.04	17.24	40.00	98.00
	Veg weight (g/0.25m ²)	40.30	23.74	12.75	94.00
	Bulk density	1.08	0.09	0.88	1.32

These infiltration runs would mimic intense, short-lived rainfall events. The fact that very little sediment yield was produced from the eastern South Dakota sites suggests that erosion from these grasslands is actually quite low. Sedimentation of streams feeding into the Big Sioux River would more likely be due to the process of natural stream bank erosion or sediment entering the stream from hoof action of livestock activity and not from overland flow. In western South Dakota, sedimentation of streams could come from soil erosion from uplands as indicated by our sediment yield estimates. Another mechanism of sediment loadings that our measurements technique does not explain is the process of overland flow resulting in gully formation. During intense rainfall events, overland flow could create cutting and gulley erosion. At the high experimental application rates, 66 and 72% of the water applied ran off at Cottonwood and Sturgis, respectively. At the eastern South Dakota locations, runoff rate accounted for 16 to 64% of the application rate.

These data suggest that livestock grazing of riparian pastures in eastern South Dakota, does not impact sediment loading from the surrounding uplands. Use of vegetation was fairly even across the pasture as indicated from the vegetation measurements at different distances from the stream. Since riparian pasture size was relatively small at the eastern South Dakota locations, livestock distribution was even. Cattle tend to not overgraze near the stream. One reason might be the fact that 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.

Water Quality from High Stream Flow Events in Eastern South Dakota

Five pasture sites along tributaries of the Big Sioux River in eastern South Dakota were analyzed for water quality during two high stream flow events in the spring of 2008. Water samples were taken up and downstream of the producer sites and samples were analyzed for Total Dissolved Solids (TDS), Total Suspended Solids (TSS), and Total Phosphorus (P) at the Olson Station Biochemistry Lab in Brookings, SD. The TDS and TSS were generally below the daily maximum allowed levels for domestic water supply and cold and warm water fish life propagation (Table 4). There are no maximum levels established for P, but higher levels from June runoff events suggest nutrients from crop fields are likely entering streams given that overland flow of P attached to sediment from pasturelands would be

very minimal in eastern South Dakota (Table 3). Generally all parameters changed very little from up and downstream monitoring points (Table 4).

Table 4. Water quality parameters from five pasture sites on tributaries of the Big Sioux River in Brookings and Moody Counties during two high stream flow events in the spring of 2008.

Tributary	Site	Up/down river	Date	TDS (ppm)	TSS (ppm)	Total Phosphorus (ppm)
Spring Creek	A	up	5/13/2008	480	11	0.061
Spring Creek	A	down	5/13/2008	484	15	0.081
Spring Creek	A	up	6/6/2008	512	15	0.241
Spring Creek	A	down	6/6/2008	472	23	0.301
Bachelor Creek	B	up	5/13/2008	1502	18	0.152
Bachelor Creek	B	down	5/13/2008	1432	31.5	0.172
Bachelor Creek	B	up	6/6/2008	1012	160	0.787
Bachelor Creek	B	down	6/6/2008	1028	198	0.764
Unnammed	C	up	5/13/2008	704	2.5	0.36
Unnammed	C	down	5/13/2008	748	2.5	0.044
Unnammed	C	up	6/6/2008	444	37	0.425
Unnammed	C	down	6/6/2008	428	38	0.439
Bachelor Creek	D	up	5/13/2008	1596	24	0.154
Bachelor Creek	D	down	5/13/2008	1492	21	0.152
Bachelor Creek	D	up	6/6/2008	1100	54	0.597
Bachelor Creek	D	down	6/6/2008	980	151	0.742
Medary Creek	E	up	5/13/2008	694	32	0.133
Medary Creek	E	down	5/13/2008	628	30	0.137
Medary Creek	E	up	6/6/2008	312	88	0.423
Medary Creek	E	down	6/6/2008	360	82	0.417

Alternative Water Source

The western South Dakota riparian demonstration site compared vegetation structure along the lower fork of the Grand River. Transects running parallel to the river at a distance of 10, 50, and 100 m away were established at 3 sites per pasture. Vegetation structure using the Robel Pole method was made 20 times per transect in October 2008. One pasture had an alternative water source that consisted of piped water to a livestock tank approximately one quarter mile from the river, while the control pasture did not have an alternative water source. The pastures were continuously grazed from June to August.

The results showed that cattle tended to graze more heavily close to the river in the pasture without the alternative water source (Fig. 2) compared with pasture that had the alternative water source (Fig. 3).

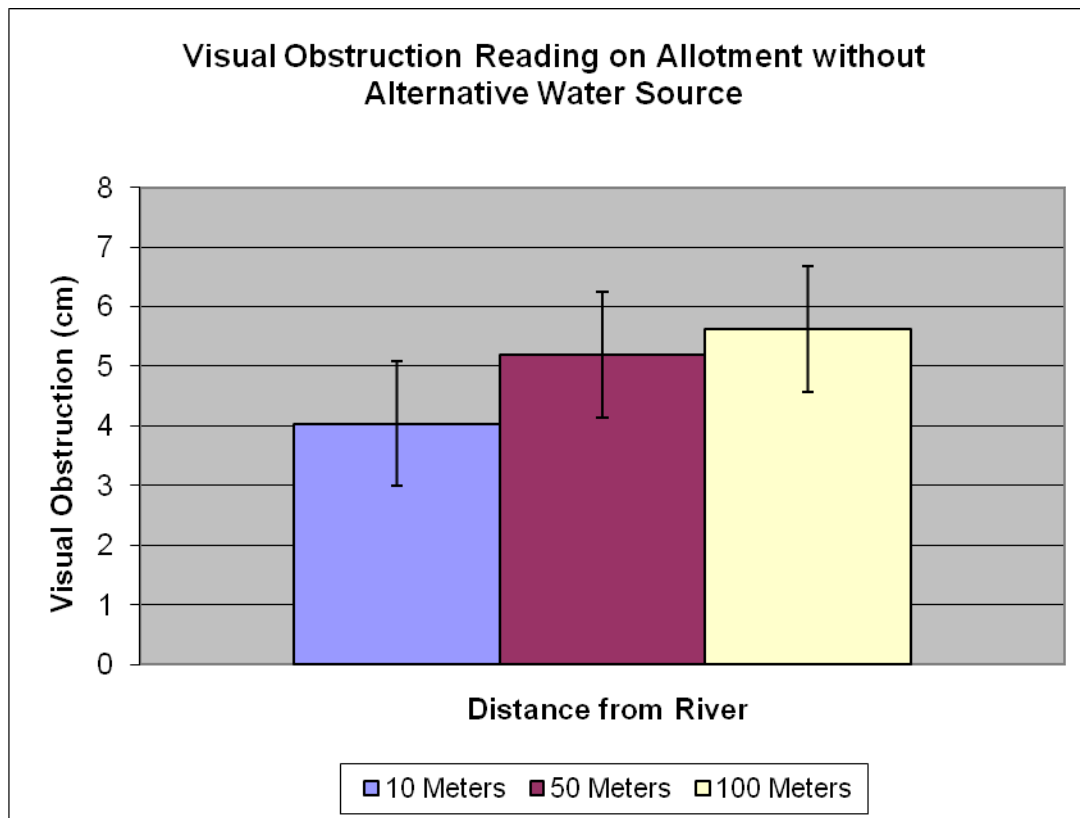


Figure 2. Visual obstruction (cm) measured in October 2008 from three transects running parallel to the lower fork of the Grand River in a pasture grazed from June-August without an alternative water source.

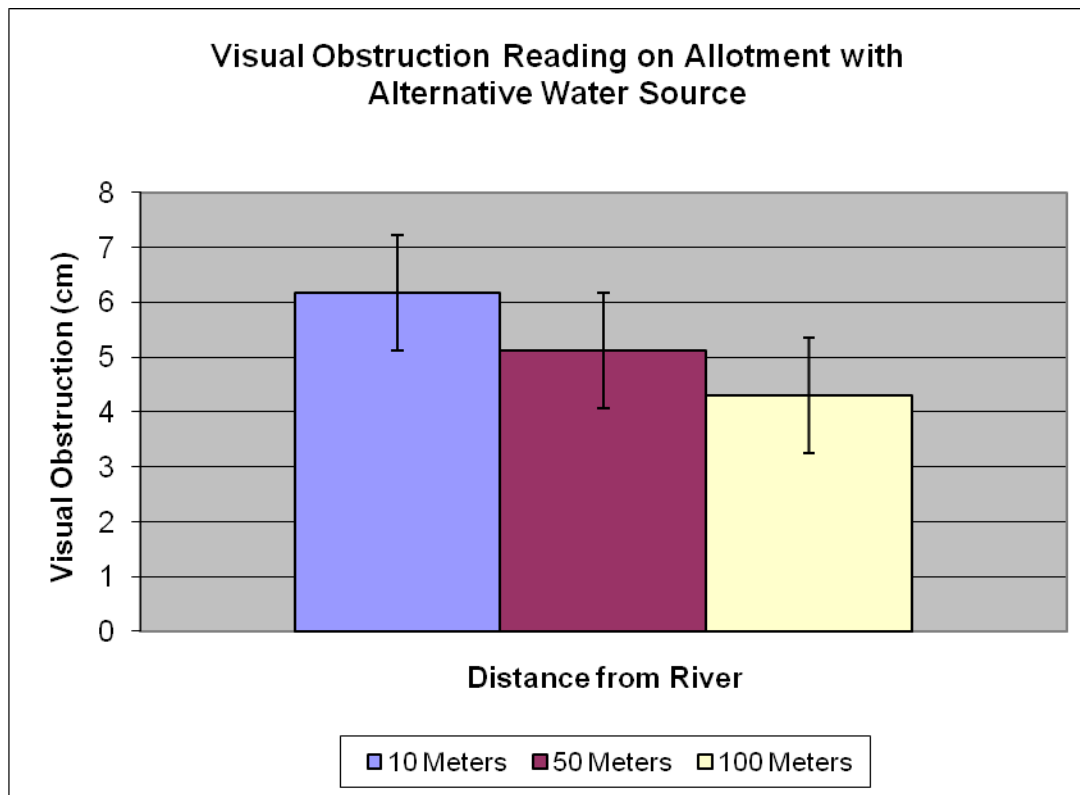


Figure 3. Visual obstruction (cm) measured in October 2008 from three transects running parallel to the lower fork of the Grand River in a pasture grazed from June-August without an alternative water source.

These results provide evidence that livestock grazing distribution is affected by management methods such as providing piped water. In theory, if cattle drink from water provided in a tank away from a stream or river, they will spend less time in the riparian zone.

CONCLUSION

The results of the riparian demonstration projects in eastern and western South Dakota provide evidence that management practices that entice livestock to drink from sources other than the riparian area are beneficial to reducing water quality. Runoff, sediment yield and nutrients entering eastern South Dakota streams from pasturelands is likely quite low according to our simulated runoff tests. In western South Dakota, runoff and sediment can be significant during intense rainfall periods leading to gulley erosion. Proper stocking rates leading to good vegetation and litter cover are important to enhance infiltration and reduce runoff.

APPENDIX 3

REGISTRATION FORM

Complete the form below and
submit with payment to:

Kyle Schell
Box 2170, ASC 105, SDSU
Brookings SD 57007

Name _____

Company/Operation Name _____

Address _____

City, State ZIP _____

Phone _____

Email _____

Web Address _____

Please indicate the best location for us to pick you/your group up along the way. The bus is departing from Miller and stopping in several locations: *Highmore sale barn, Krocplin Ag Center west of Blant, Lamb's Chev. in Onida, Nagel Motors near Gettysburg, and Shorty's in Sebby.*

_____ No. of people attending from your operation

_____ Amount enclosed
*\$85 per person for SD Grassland Coalition Members
\$100 per person for non-members*

Please make checks payable to:
South Dakota Grassland Coalition

For planning purposes, please send registration
form and payment by
Tuesday, August 5th,

Please make copies of this form as needed.



Kyle Schell
Box 2170, ASC 105, SDSU
Brookings SD 57007

South Dakota Grassland Coalition Annual Bus Tour



August 12-13, 2008

*The trip takes participants to
Bismarck, ND to tour area ranches
and visit the Burleigh County
Conservation District's
cover crop test plots.*



Join us on the tour!

The South Dakota Grassland Coalition invites you to attend the 2008 Bus Tour, Aug. 12- 13. This year's tour features a visit to Bismarck, ND where participants will hear presentations from area producers, Gabe Brown and Ken Miller, about proven grazing and management techniques. Also on the agenda, a visit to the Burleigh County Soil Conservation District's cover crop test plot.

The two-day tour will provide valuable insight about methods that South Dakota producers can adopt into their own programs - to increase productivity and efficiency of grazing and crop lands.

Register to attend!

Cost to attend is \$85 per person for members of the South Dakota Grassland Coalition or \$100 per person for non-members. The fee includes transportation, meals, lodging and tour materials. (The non-member fee includes a one year membership to the South Dakota Grassland Coalition.)

Reserve your space by completing the registration form and mailing it, with payment, to:

Kyle Schell
Box 2170, ASC 105, SDSU
Brookings SD 57007

Registration deadline is Tuesday, August 5, 2008.

FOR MORE INFORMATION:

Kyle Schell
Range Mgmt. Outreach Coordinator
Phone: (605) 688-6623
Email: kyle.schell@sdstate.edu

Justin "Judge" Jessop
South Dakota Grassland Coalition
Phone: (605) 280-0127
Email: jjessop@sdconservation.org

Learn more about the South Dakota Grassland Coalition at www.SDGrass.org.

Tour Itinerary

August 12th	Depart from Forman Bus Sales, Miller
8:00 am	
8:00 – 8:25	Travel to the Highmore sale barn
8:30 – 9:05	Travel to Kroeplin Ag Center (Junction of Hwys 14 and 83)
9:15 – 9:30	Travel to Lamb's Chev., Onida
9:40 – 10:05	Travel to Nagel Motors (Junction of Hwys 212 and 83)
10:15 – 10:50	Travel to Shorty's, Selby
11:00 – 1:00	Travel to Gabe Brown's Ranch
12:00	Sack lunch served on the bus
1:00 – 4:40	Tour Gabe Brown's Ranch
4:50 – 5:00	Travel to *BCSCD cover crop test plot
5:00 – 5:50	Tour BCSCD cover crop test plot
5:50 – 6:00	Travel to McDowell Lake Park
6:00 – 7:45	Eat Supper at McDowell Lake Park
7:45 – 8:00	Return to motel for overnight (Comfort Suites, Bismarck)
	<i>* Burleigh County Soil Conservation District</i>
August 13th	
7:45 am	Bus departs motel
7:45 – 8:30	Travel to Ken Miller's Ranch
8:30 – 11:30	Tour Ken Miller's Ranch
11:30 – 12:00	Travel to Prairie Knights Casino
12:00 – 1:30	Lunch at the Casino
1:30 – 3:00	Travel to Shorty's, Selby
3:00 – 3:30	Travel to Nagel Motors, near Gettysburg
3:30 – 4:00	Travel to Lamb's Chev., Onida
4:00 – 4:15	Travel to Kroeplin Ag Center
4:15 – 4:50	Travel to Highmore sale barn
4:50 – 5:30	Travel to Miller, Tour Concludes

Note: Forman Bus Sales, the Highmore sale barn, Kroeplin Ag Center, Lamb's Chev., Nagel Motors and Shorty's are pickup/drop off locations for tour participants. Please indicate, on the registration form, the best location for you to join the tour.

Featured Presenters



Gabe Brown
Brown's Ranch
Bismarck, ND

The Brown Ranch, located 5 miles east of Bismarck, ND has overcome the impact of extreme drought conditions and consecutive years of crop loss, due to hail, by implementing innovative management techniques. Learn how grazing practices and zero-till cropping methods have naturally enhanced and improved soil health on the Brown's Ranch. Known for thinking outside the box, Gabe Brown will share creative and profitable programs for maximizing the wellbeing of crop land. Visit the Brown Ranch online, www.sustainable ranching.com.



Ken Miller
Burleigh Co. Soil
Conservation District
Bismarck, ND

Ken Miller serves as the District Technician for the Burleigh County Soil Conservation District, in Bismarck, where he works with producers to design and implement grazing systems. With over 35 years in the farm/ranching industry, Miller is also known as an expert in terms of rotational grazing practices. Learn how Miller and his family have applied various techniques to their land, including tanks, fences, and strict rotation schedules based on Mother Nature. Miller will explain the benefits of his program; increased carrying capacity and more efficient use of crop- and range lands.

APPENDIX 4

Space is limited to 80 attendees.
Register now!

Birds. At Home, On the Range. June 5 - 6, 2009

REGISTRATION FORM

Name: _____ Organization: _____

Address: _____ City/State/Zip: _____

Phone: _____ Email: _____

Number in Party: _____ ADULTS _____ STUDENTS

Interested in earning college graduate credit? ☐ YES ☐ NO Contact Dr. Kristel Bakker: 605 256-5182 or Kristel.Bakker@dsu.edu.

Interested in transportation from your motel (in Kadoka or Murdo) to Rasmussen-Lehman 33 Ranch? ☐ YES ☐ NO

Please mail registration form and \$20 per person OR \$35 per couple (if accompanying a student) to:

Judge Jessop
24690 299th Ave. Presho, SD 57568
(605) 280-0127

For planning purposes, registration form and fee must be received by **June 1, 2009.**

Birds. At Home, On the Range. Bird Watching Tour



Blue Grosbeak
Photo by Doug Eckhard

June 5 - 6, 2009
Rasmussen-Lehman 33 Ranch
Belvidere, SD

Hosted by:
South Dakota Grassland Coalition
www.SDGrass.org

Driving Directions to Rasmussen-Lehman 33 Ranch:

From Murdo – Travel south on Hwy. 83 to White River (approx. 24 miles). Turn west/right on Hwy. 44. Continue traveling west for 20 miles.

Drive past mile marker 179.
Turn right/north at the next gravel road.
Continue 3 miles north and 1 mile west.

From Kadoka – Travel south on Hwy. 73 to Hwy. 44. Turn left/east on Hwy. 44 and continue east for 20 miles. Drive past mile marker 178.
Turn left/north at the next gravel road.
Continue 3 miles north and 1 mile west.

Shuttle service is available from Kadoka and Murdo to Rasmussen-Lehman 33 Ranch for this event. Please indicate your interest in the shuttle on the registration form.



Burrowing Owl
Photo by Doug Eckhard

For more information about the tour, contact:

South Dakota Grassland Coalition
Justin "Judge" Jessop
PH: (605) 280-0127
Email: jessop@sdcobservation.org

Birds. At Home, on the Range.

ITINERARY

June 5, 2009

Gather at Rasmussen-Lehman 33 Ranch 3:30 - 4 pm

Welcome/Review of Schedule 4:00 - 4:15

-Dave Steffen, SD Grassland Coalition

Introduction to the SD Grassland Coalition 4:15 - 4:30

-Lavern Koch & Jim Faulstich, SD Grassland Coalition

33 Ranch History 4:30 - 5:00

-Don Rasmussen, Co-Owner, Rasmussen-Lehman 33 Ranch

Bird Identification 5:00 - 5:30

-Silka Kempema, South Dakota Game, Fish & Parks

-Nancy Drilling, Rocky Mountain Bird Observatory

Plant Identification 5:30 - 6:00

-Amy Lehman, Co-Owner, Rasmussen-Lehman 33 Ranch

-Dave Old, South Dakota Game, Fish & Parks

BBQ in the Badlands 6:00 - 6:45

Habitat speaker "Grassland Birds" 6:45 - 7:30

-Dr. Kristel Bakker, Dakota State University

Split into groups with leaders 7:30 - 7:45

Bird watch/record species (optional) 7:45 - 8:30

June 6, 2009

Sunrise Coffee and Rolls 6:00 - 6:30 am

Bird Watch and Record Species in Groups 6:30 - 10:15

Groups Rotate Through Different Stations

- Bird Watching
- Bird Banding
- Invertebrate Trapping

Coffee, Rolls and Discussion 10:15 - 10:30

Bird Photography 10:30 - 11:00

-Doug Backlund, South Dakota Game, Fish & Parks

The Prairie is My Garden 11:00 - 11:30

-Lisa Dorechmer, South Dakota Ag in the Classroom

Birds and Cows: Putting Them Together 11:30 - 12:00

-Dr. Kristel Bakker, Dakota State University

Lunch and Slideshow 12:00- 12:45

The Grass Manager's View 12:45- 1:15

-Dan Rasmussen, Co-Owner, Rasmussen-Lehman 33 Ranch

Closing Comments and Discussion 1:15 - 2:00

* Bring your digital camera to take photos during the tour!

* All times are Central Daylight Time.



Rasmussen-Lehman 33 Ranch, located near Belvidere, SD, is made up of a diverse landscape suited for providing habitat for livestock and birds.

Welcome to south central South Dakota! The unique geographical landscapes, mixed grass prairies and trees found here provide habitat to numerous species of waterfowl and grassland birds.

The South Dakota Grassland Coalition invites you to take a journey to view the abundant populations of birds that make their home in this region. Learn how rangeland management plays an important role in the state's agricultural industry as well as provides an exceptional environment for South Dakota's native feathered friends.

The two-day *Birds. At Home, on the Range* tour will take you to Rasmussen-Lehman 33 Ranch, located near Belvidere, SD. While here, you'll watch and record bird species, hear presentations from land owners and conservation experts. New this year is the opportunity to earn a college graduate credit for participating in the bird tour. Please indicate your interest in earning credits on the registration form.

Space is limited to 80 participants, so register now! To pre-register, complete the attached registration form and mail your registration fee to the South Dakota Grassland Coalition. For more information, call Justin "Judge" Jessop, (605) 280-0127 or email jjessop@sdconservation.org

Cost to Participate:

\$20 per person

\$35 per couple if accompanying a student

Students - high school age and under - are free

* Registration fee includes birding materials, transportation, and meals.

To Register:

Complete the registration form and mail to

Justin "Judge" Jessop

24690 299th Ave.

Prestho, SD 57568

Lodging is not included in the registration fee.

Lodging in the area:

Days Inn Range Country - Murdo

605-669-2425 or 800-329-7466

www.daysinnrangecountry.com

H&H El Centro Hotel - Kadoka

605-837-2287 or 800-837-8011

Shuttle service is available from hotels to Rasmussen-Lehman 33 Ranch for this event.

Cancellation Policy:

No refunds after June 1, 2009.



Grasshopper Sparrow
Photo by Doug Backlund

APPENDIX 5

Watering Facilities

Justin "Judge" Jessop
Project Coordinator
Grasslands Management &
Planning Project



Grasslands Management & Planning Project

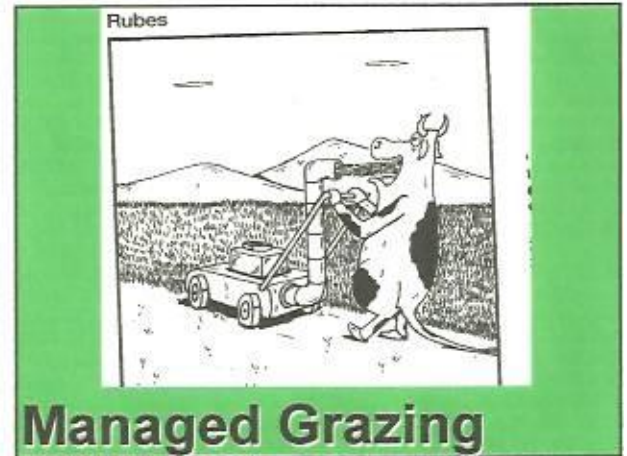
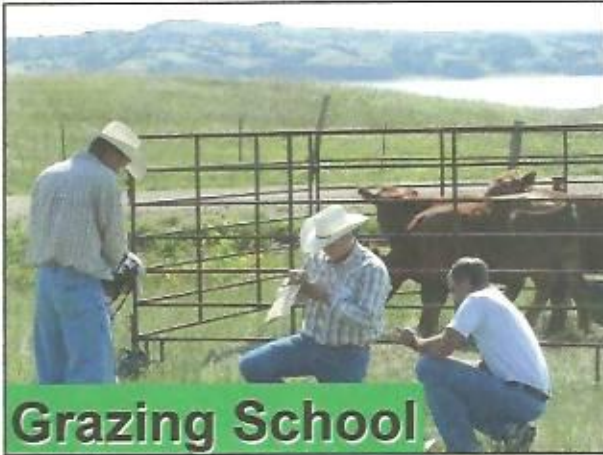
Three Parts

1. Demonstrations site across the state
2. Provide Technical assistance to producers
3. Provide Education (Bus Tours, Grazing school, HRM Workshops)



Technical Assistance





Disclaimer!!

1. I am not an *ENGINEER!*
2. These systems are based on trial and error.
3. They require a certain degree of monitoring.
4. *None* of the items were *cost shared*.

How much water do ya' need?

NRCS says for a:

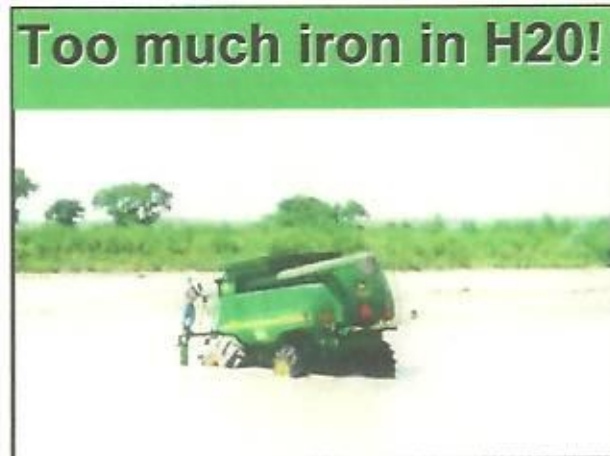
- Cow/calf pair needs 18 gal/day.
- 800 lb. growing animal 15 gal/day.
- Mature horses 18 gal/day.
- Ewes with lamb(s) 3 gal per day.

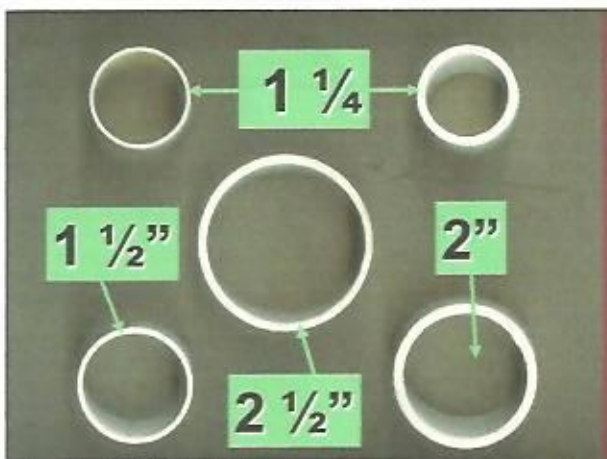
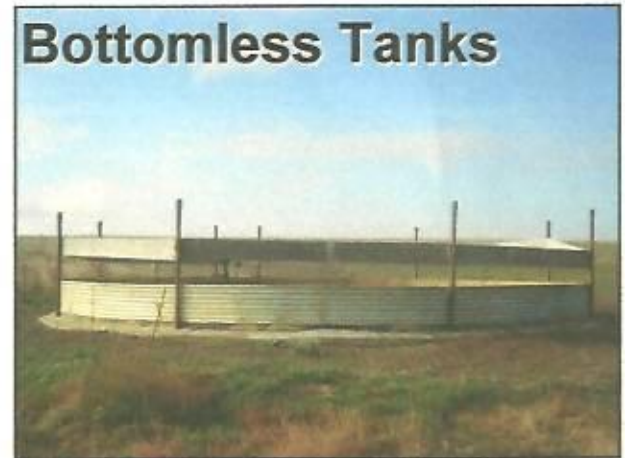
Interesting?

I found on the Internet (it has to be true!).

At 90 degrees:

- Cow/calf pair needs 20 gals/day, I have seen as high 24 gals/day
- 800 lb growing animal needs 15 gal/day
- Sheep 3.5 gals/day





Pipe quality is not a concern until you pay these!

MAY 2002		FEBRUARY 2003		MARCH 2003	
Amount Due: \$627.00		Amount Due: \$627.00		Amount Due: \$627.00	
Owner Share Meeting	276 000	Owner Share Meeting	508 000	Owner Share Meeting	565 000
Provisional Share Meeting	198 000	Provisional Share Meeting	465 000	Provisional Share Meeting	506 000
Other Share Meeting	78 000	Other Share Meeting	40 000	Other Share Meeting	67 000
Amount Due (Total)	215 000	Amount Due (Total)	120 000	Amount Due (Total)	162 000
Amount Paid	215 000	Amount Paid	120 000	Amount Paid	162 000

Over Flow Ponds



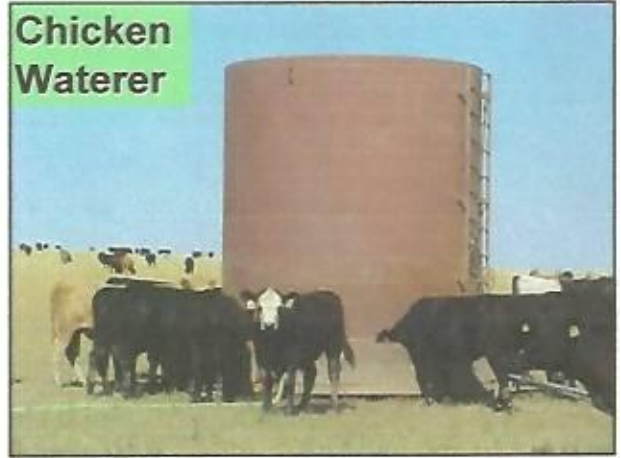
Overflow pipes



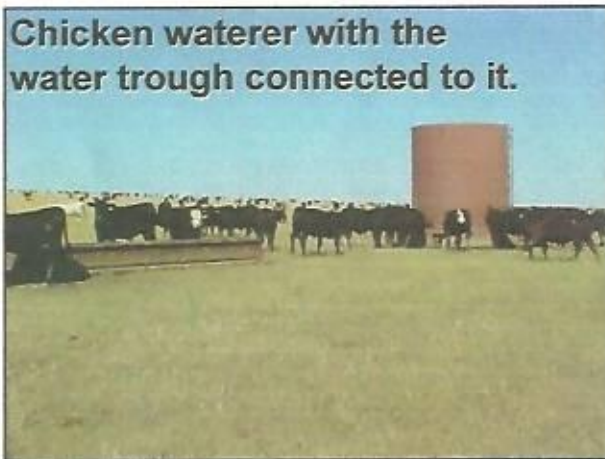
Reservoirs



Chicken Waterer



Chicken waterer with the water trough connected to it.



Recovery Time

- Many livestock numbers can be watered out of a little tank, provided there is quick recovery of the water.
- Livestock will *"wait"* in line to drink if they trust the water will be there.

**Remember
3 things**

**#1. Trust
has to be earned!**



#2. Remember!!!!

- This producer checks the yearlings at least twice a day, more like three times per day.



#3. If your neighbors think you are nuts, you're doing something right.

"Most people would rather fail conventionally than succeed unconventionally."

Allan Nation, editor, The Stockman Grass Farmer

Another thought to go home on...

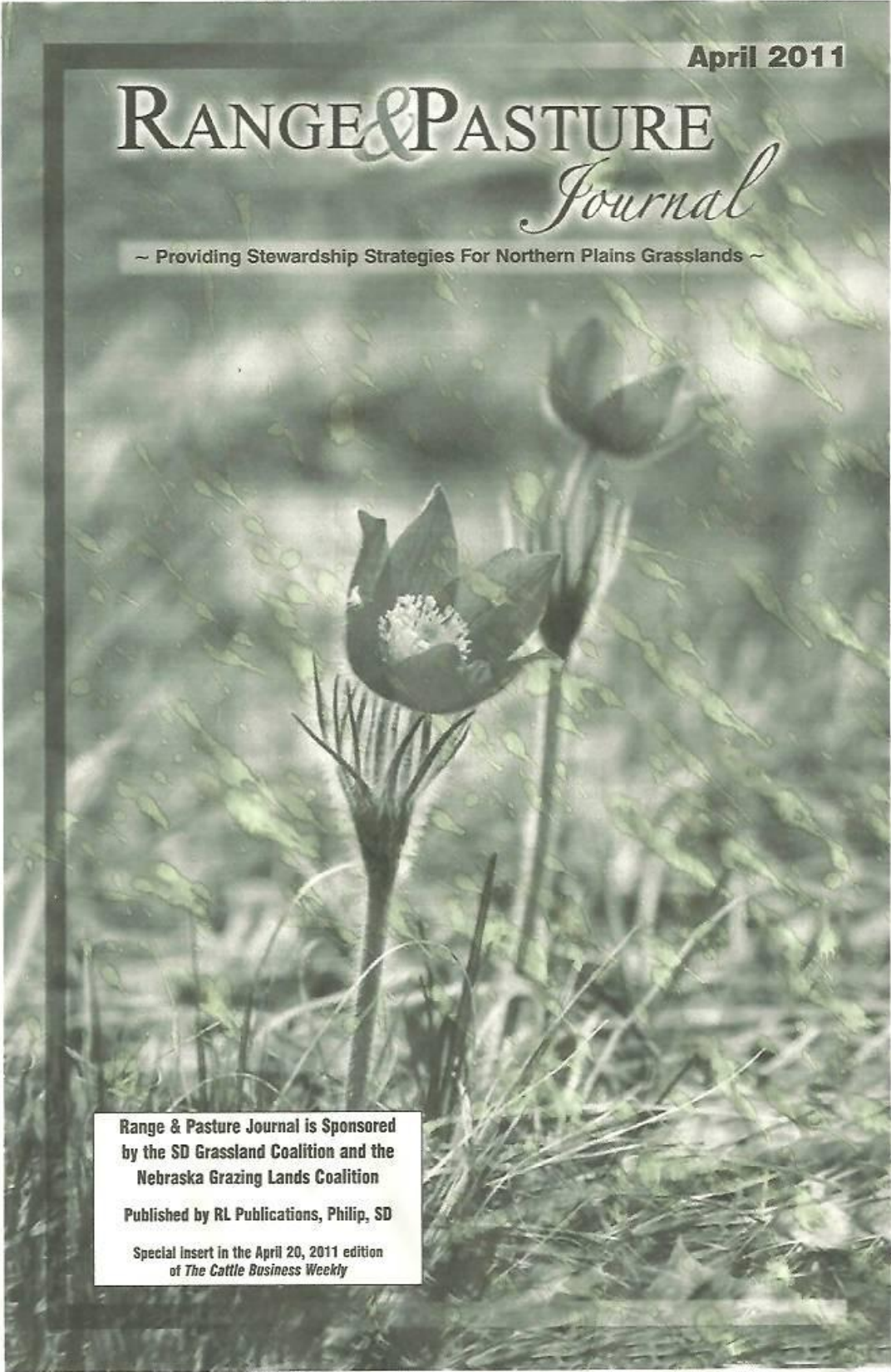
"Never be afraid to try something new. Remember that a lone amateur built the Ark. A group of professionals built the Titanic."

- Dave Barry

Any Questions?



APPENDIX 6



April 2011

RANGE & PASTURE *Journal*

~ Providing Stewardship Strategies For Northern Plains Grasslands ~

Range & Pasture Journal is Sponsored
by the SD Grassland Coalition and the
Nebraska Grazing Lands Coalition

Published by RL Publications, Philip, SD

Special Insert in the April 20, 2011 edition
of *The Cattle Business Weekly*

NEBRASKA

Grazing Lands Coalition

Re-establishing Agrarian Independence

The Nebraska Grazing Lands Coalition and UNL Extension hosted a traveling speaker at eight locations across the state from April 4-7. Paul Schwenneisen presented: "Like Our Grandfathers... How Managing for Healthy Landscapes and Directly Marketing to Consumers can Reestablish Agrarian Independence."

Schwenneisen and his wife Sarah own and manage the Double Check Ranch, a 12,000-acre holistically-managed ranch located between Phoenix and Tucson, AZ. The Schwenneisens believe that responsible, small-scale agriculture is a critical, and currently, largely missing key to a responsible economy. They realize that man-

aging land well can restore the biodiversity that our landscapes are losing at a frightening rate.

They have a biological plan to manage their land holistically, and all decisions are goal-driven to ensure that they are socially, economically and environmentally sound. They are dedicated to improving their watershed and share

the ranch with a variety of wildlife. The Schwenneisens have increased ranch profitability significantly through merchandising a natural grass-fed beef product direct to the consumer. Paul is also an active board member of the Southwest Grassfed Livestock Alliance in conjunction with the Quivira Coalition.

NE welcomes new State Conservationist

Craig Derickson is the new State Conservationist for the USDA Natural Resources Conservation Service (NRCS) in Nebraska. He began serving in his position in November, replacing Steve Chick. Derickson is a native Nebraskan who has worked for NRCS for 25 years.

He began his career in Nebraska where he served in several field, state and

regional level positions. In 2003, Derickson left Nebraska for NRCS National Headquarters in Washington, D.C. He held several national leadership positions that included National Program Manager, Branch Chief of the Stewardship Programs, and Deputy Chief for Financial Assistance Programs. Derickson also served as the State Conservationist in Pennsylvania.

Derickson holds a Bachelor of Science Degree in Agriculture from the University of Nebraska and a Master of Arts in Management Degree from Doane College in Nebraska. He is a member of the Soil and Water Conservation Society, the Society for Range Management, and a Certified Professional Erosion and Sediment Control Specialist.



Craig Derickson

"Generations on the Land" showcases families and stewardship

Each year, Sand County Foundation's prestigious Leopold Conservation Award recognizes families for leadership in voluntary conservation and ethical land management. In the new book *Generations on the Land: A Conservation Legacy*, veteran author and journalist Joe Nick Patoski visits eight of the award-winning families, presenting warm, heartfelt conversations about the families,

their beloved land, and a vision for a healthier world.

Generations on the Land celebrates these families' roles as conservation leaders for the nation—far beyond the agricultural communities where they live—and reinforces the value of trans-generational family commitment to good land stewardship. The eight landowners profiled by Patoski include six

ranchers, a forester, and a vintner. They reside across the country: in California, Nebraska, Texas, Utah, Wisconsin, and Wyoming. Their conservation accomplishments range from providing a habitat corridor for pronghorn antelope to hammering out a safe harbor agreement for grape growers.

A short introduction by a fellow conservation or

ranching professional precedes each of the personal portraits by Patoski, which are written in an informal, conversational style. Brent Haglund, president of the Sand County Foundation, provides an introduction to the purpose and work of the foundation, and a conclusion summarizes the substantive conservation contributions of the Leopold award winners.

The 136 page book is \$25. To order go to <http://www.sandcounty.org/product/Generations-on-the-Land-6465.aspx>.

Grazing Guide

A calendar listing of pasture and range events

May 18 Fencing demonstration hosted by Nick Rolling near Waterville, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

May 21 Wildflower Walk, Wildcat Hills State Recreation Area, Gering, NE, 11 a.m.

May 26-27 21st Century Grazing with Greg Judy, Johnson County Fairgrounds, Tecumseh, NE

June 6-8 South Dakota Youth Range Camp, Sturgis

June 9 Sandhills Prairie & Wet Meadow Management & Plant ID Tour at Sandhills Seasons Guest Ranch & Hunts, Bartlett, NE

June 14-15 American Forage & Grassland Council, French Lick, IN

June 17-18 SDGCL Bird Tour, Headley Ranch, White Lake, SD

June 21-22 South Dakota Rangeland and Soils Days, Lemmon, SD

June 29 Organic certification workshop hosted by Jason Klinge, Farmersburg,

IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

July 6 Stocking for Winter session hosted by Wayne Busch, Lost Nation, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

July 9 The Grain Place: Open House & Farm Tour, Marquette, NE. Dave Vetter of The Grain Place was the MOSES 2011 Organic Farmer of the Year.

July 21-23 Neil Dennis Days mob grazing tour, Dennis Ranch in Canada

July 26 Black Hills HM Tour call 402-268-5611 for more information.

July 29 Doud Ranch Tour, Midland, SD

Aug. 3 Operating beef on subdivided pasture hosted by Bret DeLarm, Wyoming, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

Aug. 3 Judy Peterson Pasture Walk, Jeffery Island, NE

Aug. 9-10 11th annual Nebraska Grazing Conference, Kearney, Neb.

Aug. 15-17 America's Grasslands Conference, Sheraton Hotel, Sioux Falls, S.D.

Aug. 18 4th Annual Rangeland Management Workshop, Oconto, NE

Aug. 18 Prescribed Burning Results on Grasslands, Red Cloud, NE

Aug. 31 Cost share and land development workshop hosted by Phil Willie, Garavito, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

Sept. 6 Gear up for fall grazing hosted by Vance and Bonnie Hogen of Canton, MN. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

Sept. 12-14 Grazing School, Oacoma. Contact Kyle Schell at (605) 688-6623.

Sept. 14-16 Grazing School, Oacoma. Contact

Kyle Schell at (605) 688-6623.

Sept. 15-17 The Grassfed Exchange, Northeast Community College, Norfolk, NE

Sept. 21 Review of 2011 grazing season hosted by John Berlage, Ridgeway, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

Oct. 21 Beef herd conservation practices hosted by Seed Savers Exchange, Decorah, IA. Contact Jennifer Bentley, ISU Extension at (563) 382-2949, jbentley@iastate.edu.

Nov. 29 - Dec. 1 Range Beef Cow Symposium, Mitchell, NE

Dec. 7-8 SD Cattlemen's Convention, Ramkota Hotel & Convention Center, Pierre, SD. The 2011 SD Leopold winner will be awarded at the event.

Dec. TBA SDGLC Annual Meeting, Americus, Chamberlain. Contact Kyle Schell at (605) 688-6623.

NGLC Board of Directors

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The Nebraska Grazing Lands Coalition (NGLC) is a part of a national effort to enhance the resource stewardship and financial success of grazing land dependent operations. Objectives of the 14-member NGLC board, made up of mostly ranchers, are to strengthen partnerships, promote volunteer assistance and participation, respect private property rights, encourage diversification to achieve and promote education, training and public awareness of the 23 million acres of grazing lands in Nebraska.

Specific projects include co-sponsoring statewide grazing conferences to pursue common interest with other grazing groups, hosting a carbon sequestration workshop to explain what it is and how ranchers may benefit, and monitoring and lobbying legislation on grazing issues.

Range & Pasture Journal
Sponsored by the South Dakota Grassland Coalition & Nebraska Grazing Lands Coalition

Published by RL Publications
Editorial: Trailhead Promotions, Kindra Gordon & Cool Valley Mills
Sales Representatives: Dannie Luddy (605) 685-0113

Don Ravolletto (605) 685-5147

Jim Scheel (605) 545-1521

Kris Peterson (701) 339-0306

Bonnie Bendigo (605) 441-0571

Grant Canover (515) 419-1004

Graphic Design: Mary Ravelletto & Josh Hawk

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Brookings, SD 57007
kyle.schell@sdstate.edu

Judge Jessop
(605) 895-2301
jljessop@kennebectelephone.com

**"A unified voice for managing
South Dakota's grass resource"**

The Coalition's goal is to provide local leadership and guidance in a cooperative effort, and provide information and technical assistance to grassland managers.

By focusing the collective power of resource management agencies, producer organizations, educational institutions, professional societies, environmental organizations, and private grassland managers, much can be accomplished.

To that end, the Coalition is a major partner in the Grassland Management and Planning Project. For more detailed information on this project, visit sdcon.servation.org and click on Grassland.

To become a member, clip and mail the form below with your \$20 payment.

**SD GRASSLAND COALITION
MEMBERSHIP - \$20**

Address _____
City _____ State _____ Zip _____
Phone _____
Fax _____
E-mail Address _____

Return to: SDSU, Attn: Kyle Schell,
ASC 105, Box 2170 • Brookings, SD 57007

SOUTH DAKOTA

GRASSLAND
COALITION

Learn & Earn: Invest your time in SDGC

It's hard to think about a drought in April with the amount of snow we had this past winter, but having a drought plan should be a part of every grass manager's master plan for the year.

I have observed the time and effort my farming friends spend studying available moisture and crop rotations and ask am I doing the same for the grass I raise?

So what do you plan on selling first if you are short on grass? Do you have a grass reserve so a sale won't be necessary? One of the goals of the South Dakota Grassland Coalition is to help ranchers develop a plan in case of a drought. I have always said 100 inches of snow won't grow much grass. Let's hope for the rain needed to produce at least a normal season for grass production but have a plan in place if it doesn't.

The South Dakota Grassland Coalition has a number of educational events planned for the year. These events will help improve our ability to manage our grass resource and place it on display so others can learn from our experiences. Some of the events include our annual bird tour, a tour of the Leopold award winner, our grazing school and annual meeting.

The bird tour has been a successful event we've held in June for the last 4 years. Our goal is educational. For the livestock producer we want to learn how to provide better habitat for our feathered friends. For our bird watching enthusiasts we want to display the importance of our grasslands to our bird populations. This year's bird tour will be in White Lake on June 17-18. No cows, no grass, no birds - it's that simple.

2010 marked the first year of bringing the Leopold Award to South Dakota. The Doud's from Midland were our honorees. The SDGC will host a tour of the Doud ranch on July 29. The Doud family is going to share with us some ideas of what is working on their ranch.

Each year in September the SDGC sponsors a grazing school in the Chamberlain area. The school has a limit of 30 per session. Last year we added a second session to accommodate the growing interest. The school will be September 12-16. Don't wait until August to enroll as the school fills up fast.

At our annual meeting in December our goal is to not only conduct the business of the organization but to host a speaker who will help improve the management of our business. The topic may be business succession ideas, biological

pest controls or winter grazing strategies.

To keep up to date on what the South Dakota Grassland Coalition is doing please consider joining. Your membership \$20 per year or \$35 for two years will put you on our mailing list for Grassroots our coalition newsletter. You can contact our coordinator Kyle Schell at Box 2170, Brookings, SD 57006 (kyle.schell@sdstate.edu) to join.

The first person reading this column who contacts Kyle at the address above with the correct answer to the following question will have a one year free membership paid by this author. What is an *Aphodius erraticus*? Come to some of our events in the future and you will learn more about this creature.

Lyle Perman,
South Dakota
Grassland Coalition
Chairman

Sign up now for South Dakota Youth Range Camp

Helping train tomorrow's leaders in range and natural resource management and stewardship of natural resources is the goal of the annual South Dakota Youth Range Camp.

The camp is held at Sturgis Brown High School and Western Dakota Technical Institute just east of Sturgis, S.D.

Campers will take part in range plant identification, wildlife habitat training, range judging, ecological sites, and a range judging contest. Young adults from 14 through 18 years of age who have a sincere desire to learn more about the range resource and its management are encouraged to attend. Youth from town or country are equally wel-

come. It is not necessary to be a member of FFA, 4-H, etc. Permission of parent or guardian is required.

The camp costs \$80 per student. Camp registration is due by May 22. Contact Derek Oliver with the NRCS in Faith, S.D. at (605) 967-2561 to reserve your spot or email Derek.oliver@sd.usda.gov.

This year a \$500 SDSU Range Science Scholarship sponsored by the SDSU Dean of Agriculture will be awarded to the top placing returning camper at Range Camp.

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FORAGE FOCUS

Forages to consider for wet areas

Wet areas do not need to be wasted areas - not if the right grasses and legumes are growing there, says University of Nebraska Extension forage specialist Bruce Anderson.

He notes that many farms and ranches have low, wet areas that produce mostly weeds. However, some useful forage can come from moist areas with the right grasses or legumes. But you need to know what to plant and then be ready whenever soils are dry enough to work, he points out.

Anderson states, "If seeding these wet areas is in your plans, make sure you plant something that will tolerate wetter conditions once they return. Many good forage grasses can survive and grow even when soils are water saturated for a long time. It becomes more complicated, though, when other limitations, like saline or alkaline soils, affect the results."

Anderson says grasses suited for wet and saline/alkali soils are the wildrye grasses like beardless wildrye and Canada wildrye. Many wheat grasses also work, including slender, tall, and western wheatgrass as well as wheatgrass hybrids. Creeping foxtail is especially good if you plan to graze these forages later on.

For sites that are just waterlogged or periodically flooded with little or no salinity problems, reed canarygrass, Virginia wildrye, meadow fescue, and red top can be used. On the fringes of these sites,

orchardgrass, timothy, and switchgrass may grow well.

Only a few legumes are adapted to wet soils, according to Anderson. They include alsike and strawberry clover as well as birdsfoot trefoil. These legumes also tolerate a little bit of salinity or alkalinity.

Rust-resistant switchgrass

A Virginia Tech horticulturalist has received a \$1 million grant from the National Institute of Food and Agriculture to develop rust-resistant switchgrass varieties.

The fast-growing warm-season perennial is seen as a potential feedstock for cellulosic ethanol production, but it could be devastated by a rust fungus that has been identified as *Puccinia emaculata* Schwein, says Bingyu Zhao. He and his colleagues have already identified several rust-resistance genes in a collection of 2,000 switchgrass plants at Virginia Tech's Kentland Farm.

"A potential virus-induced gene-silencing tool for quickly analyzing the function of rust-resistance genes in switchgrass has been developed," says Zhao. "The aim is to breed broad-spectrum rust-resistant switchgrass cultivars that could be strategically deployed according to the local rust pathogen population to ensure the large-scale and sustainable biomass production in the future. Deployment of host resistance genes guided by rust population genetics information is the best

practice to durably and sustainably protect switchgrass feedstock production against rust infection."

In 2009, Zhao received a \$1 million award from the National Science Foundation for his research on a disease-resistant gene in corn that will prevent bacteria from invading distantly related plant species. His work could help plant breeders transfer resistance genes from model plant species into important crop plants.

Co-investigators on the switchgrass project are Brett Tyler, Virginia Tech plant pathologist; Stephen Marek and Carla Garzon, Oklahoma State University plant pathologists; and Bing Yang, Iowa State University plant geneticist.

New winter wheat variety earning acclaim

Producers eager to take advantage of viable fall-planted winter cereals may want to consider Willow Creek awnless winter wheat. It is already being planted on an estimated 20,000-25,000 acres in Montana, according to Montana State University forage specialist Dennis Cash. That number is expected to increase as more seed becomes available. The relatively new variety is the first winter wheat variety to outperform many spring-planted forages because it makes excellent use of the region's minimal precipitation. It also contributes significantly to farmers' bottom line because it requires less irrigation, is fall-planted, and allows farmers to maintain good yields when rotating out of alfalfa.

Cash and others demonstrated that this early exposure to rainfall helped Willow Creek outperform spring-planted cereals like barley and oats, while maintaining similar feed quality. In trials, it was yielding 2.2 to 4.1 tons of hay per acre by early July. The forage tested high for crude protein and digestibility with a low risk for nitrate toxicity. In background trials, Cash found that cattle gained 2.5 pounds per day on a high-roughage diet of Willow Creek.

Forage specialists encourage growers to take their fields out of alfalfa every five to six years in order to keep weeds and soil-borne diseases at bay. Willow Creek represents a good stand-in because it allows growers to maintain consistent forage yields, an important financial consideration.

Because most producers interested in Willow Creek raise livestock, fall planting is a big plus for another reason—it shifts some of the workload and operating costs off springtime, when there is plenty of calving, field work and other important chores to be done.

New fescue variety being researched

A USDA grass breeder has rediscovered a forage grass that seems just right for today's intensive rotational grazing. Michael Casler, an Agricultural Research Service (ARS) geneticist at the agency's U.S. Dairy Forage Research Center in Madison, Wis., has recently developed a new variety of meadow fescue. Meadow fescue has been long forgotten, although it was popular after being introduced about 50-60 years before tall fescue.

Meadow fescue is very winter hardy and persistent, having survived decades of farming. It emerged from oak savannah refuges to dominate many pastures in the Midwest's driftless region, named for its lack of glacial drift, the material left behind by retreating continental glaciers. Casler and his colleagues have since found the plant on more than 300 farms in the driftless region of Wisconsin, Iowa and Minnesota. Using DNA, Casler has developed a new variety of meadow fescue called Hidden Valley, and its seed is being grown for future release.

Non-toxic fungi called endophytes live inside meadow fescue, helping it survive heat, drought and pests. Unlike the toxic endophytes that inhabit many commercial varieties of tall fescue and ryegrass, meadow fescue does not poison livestock.

Geoffrey Brink, an ARS agronomist working with Casler, discovered that meadow fescue is 4%-7% more digestible than other cool-season grasses dominant in the United States.

In another study, meadow fescue had a nutritional forage quality advantage over tall fescue and orchardgrass that may compensate for its slightly lower annual yield further north, as reported in the *Agronomy Journal*.

Let's go birding

Bird watching tour to visit Headley Ranch

This year's bird watching tour, hosted by the South Dakota Grassland Coalition, is set for June 17-18 and will visit the Headley Ranch at White Lake, S.D.

The Headley Ranch is a unique mixed grass prairie ranching operation that implements several conservation efforts to support diverse livestock, crops and birds.

The tour will include time to identify birds and plants, talk about habitat restoration efforts, banding of birds and kids' activities.

The bird watching event has quickly become a popular event for the SDGC. All ages are invited to attend to learn more about South Dakota's bird population and plants.

Cost is \$20 a person or \$35 a couple. Students high school age and under are free. Space is limited to 80 participants. Registration can be sent to Justin Jessop at 24690 290th Ave, Preshe, SD 57568. Or contact him for more information by calling (605) 280-0127 or email jessop@sdconservation.org.



The Meadowlark is a common bird sure to be seen on the tour June 17-18.

Studying ultra-high stocking density

SDSU range science professor and researcher Sandy Smart is planning a second field season studying ultra-high stocking density or mob grazing in rotational grazing settings. Smart's research is focusing on determining the harvest efficiency of cattle grazing at ultra high stocking densities compared to typical rotational grazing stocking densities, while also considering animal performance.

This year's research will build on the inaugural study that was conducted last summer in collaboration with the University of Nebraska-Lincoln (UNL) at a ranch in the eastern Sandhills near Rose, Nebraska and at the SDSU Cow/Calf Unit in Brookings. Funding for the project is from USDA's 5-State Ruminant Consortium Special Grant Program.

Smart explains that the purpose of ultra-high stocking is to trample uneaten forage to build soil. He says, "Our ultra-high stocking densities of >200,000 lbs/acre certainly achieved this. However, practitioners also must know how much forage the cattle will eat in each paddock so he/she may calculate the

appropriate size paddock and the number of paddocks needed to meet the daily forage demand of the herd. Our study showed that cattle consumed between 35-40% of the available forage under ultra high stocking densities and trampled 50%, for a utilization of about 90%. This level of utilization is well above the recommended rate of 50% as practiced under moderate grazing. Therefore ultra-high stocking must be conducted with care and for a specific goal."

Smart also notes that ultra-high stocking density grazing requires more management and grazing mistakes - such as not moving livestock often enough - could cause a reduction in animal performance. Through continued research he aims to develop additional management information for graziers.

Smart is also collaborating with David Clay in the Drought Center to assess range health, productivity, and sustainability in these mob grazing settings compared to previous grazing systems at those locations. Water quality improvements to the watershed are also being monitored.



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Building healthier soils & pastures

This South Dakota rancher is doing just that with mob grazing

By Kindra Gordon

"My goal is to have the cattle use 60% of the vegetation and trample the other 40%," that's how Reliance, South Dakota rancher Randy Holmquist describes his use of mob grazing.

The practice entails using an ultra-high stock density of cattle on a small pasture area and then allowing the area to regrow and recover for up to a year before being grazed again.

Using temporary fence built with polywire—and the help of his wife Julie, Holmquist uses a stock density of as much as 900,000 lbs./acre and may move this "mob" of cow-calf pairs to new areas for grazing as much as six times/day. He and his wife run a herd of Red Angus cows and do custom grazing.

After experimenting with mob grazing for the past five years, Holmquist says the result has without a doubt shown improvement in soil and plant health in his pastures.

He explains, "Trampling the vegetation helps build organic matter into the soil. By building organic matter, you then get more water holding capacity, more dung beetles and earthworms, and eventually biodiversity of plants."

Holmquist reports that after the first couple years of mob grazing, he began seeing a transition in his pastures from what was once mostly bromegrass to more native grasses like western wheatgrass, big bluestem, and green needlegrass.

He adds, "The plants also seem to be healthier with bigger leaves, which allows the plants to capture more solar energy." And,

Holmquist has observed that his grass plants are staying in a vegetative, higher nutritional state longer. "When plants are less vigorous, they mature and go to seed quickly, but we are seeing our grasses stay in the vegetative stage longer as a result of mob grazing," he says.

Thistles are also less of a problem. "It seems like when the soil is healthier and covered with plant litter you don't have a noxious weed problems either," Holmquist notes.

Not An Exact Science

Holmquist acknowledges that mob grazing requires some trial and error. "It's not an exact science. You need to experiment with how high a stock density you want to put on an area and when you'll need to move them herd—whether it's daily or a couple times a day."

When Holmquist initially started mob grazing, he started on a small scale, and he encourages others to do the same. He suggests to producers, "Get some polywire and just experiment. Run 100,000 lbs. on a small area and then watch that area recover."

Holmquist clarifies that mob grazing does not mean you will mob graze during the entire growing season. "I do it off and on throughout the summer," he says.

For instance, he will mob graze his herd of about 300 pairs for a few days at the beginning of the grazing season, and then he might move them onto a larger area and rotational graze them for several days or weeks before doing a few more days of mob grazing.

Holmquist notes that it is important to create a grazing plan at least thirty days



Randy Holmquist of Reliance, S.D. has been biomonitoring his pastures and using mob grazing techniques.



All total, Holmquist will mob graze about 300 acres beginning in May and through the growing season.

prior to the growing season based on factors such as rainfall, number of animals, days of rest and recovery since last grazing, estimate of forage available, and past grazing records.

All total, Holmquist will mob graze about 300 acres beginning in May and through the growing season. He emphasizes that those mob grazed acres will then need a long recovery time.

"We will only graze the mob grazed areas once during the growing season. Occasionally, we might return to that area with the cattle in the winter, but recovery time is essential

with mob grazing," stresses Holmquist.

He continues, "All grasses don't recover at the same rate, so they need that time."

For first-timers giving mob grazing a try, Holmquist cautions that the area can look pretty beat up after being grazed at a high stock density. But Holmquist says, "The more animal impact you can get on an area, the more change, and with enough recovery time it comes back better. Recovery time is the secret."

Advice for Others

Holmquist also advises others considering mob

Mob Grazing Do's and Don'ts

University of Nebraska extension educator Terry Gompert has followed the progress of several cow-calf producers like Holmquist who are successfully integrating mob grazing into their operations. He reports that once the stock densities are concentrated and the animals are moved one or more times per day, plant diversity is bouncing back and forage production is increasing two- to four-fold.

Gompert credits this enhanced production to the soil building from the compaction of plants into the ground, the manure distribution from the high stock density and the control of unwanted plants—because the cattle are so highly concentrated in a small area they are forced to eat or trample all the plants in the area.

Grazing Guidelines

If you are considering giving mob grazing a try:

Be creative. "People often say: I don't have enough cows and I don't have enough time," says Gompert. He suggests combining your own herds or combining herds with a neighbor. The latter choice allows you to increase stock density and share land and labor.

Have a plan. Plan ahead where the cattle will be grazing and what you'll stockpile for fall and winter grazing.

Make the cattle walk. For access to water, a temporary lane can be created with electric fence. The lane can then be moved with each rotation.

Back fences are optional. Some back fences may be needed when you are first starting a mob movement to prevent cattle from going back to regrow where they've been—but most mob grazers have found that cattle don't go back where they were the day before.

Ground litter is key. Once an area has been mob grazed and litter is sufficiently on the ground, cattle need to be moved to a new area.

Be willing to experiment. Gompert says experimenting to find what fits your operation will be necessary. "Different tools work in different environments," he says. And he adds, "You don't need to use ultra high stock density every time. It's a tool like a hammer. You don't use a hammer for every job. Mob graze for one day and see what it does."

Editor's Note: Sadly, Terry Gompert passed away in March.

grazing to pay attention to animal performance. He says, "As you estimate stock density, you want to estimate how much forage is there and make sure adequate forage is available to meet the animals' needs. I haven't seen any negative effects on gain or animal performance, but you need to monitor that."

He notes that this is where the willingness to experiment, be flexible and adjust is important.

In offering advice to others, Holmquist says it can be an adjustment getting used to the idea of trampling some of the forage rather than using it for grazing. "It took me a while to accept that too, but you

need to realize you are putting that forage in the bank by putting it in the soil to build organic matter."

Lastly, Holmquist acknowledges that the fencing and moving of cattle to make mob grazing does take an investment of time. However, he counters that by pointing out, "Haying takes a lot of time too. With mob grazing the time you put in pays off."

Editor's Note: Randy Holmquist is currently taking classes to become a certified holistic trainer. He intends to continue ranching, but eventually plans to offer holistic management workshops and consulting services as well.



Mob grazing entails using an ultra-high stock density of cattle on a small pasture area and then allowing the area to regrow and recover for up to a year before being grazed again.



Shown is one of Holmquist's pastures after the mob has grazed it. The cattle have helped build the soil's organic matter through trampling.

But mob grazing may not be for every situation

University of Nebraska Extension forage specialist Bruce Anderson has tried mob grazing on his own pastures in Nebraska—with varying results.

Specifically, Anderson cautions that mob grazing is more difficult in extremely wet conditions. Last year he started mob grazing in late May by placing the equivalent of about 400,000 lbs. of cattle on one acre of grass each time. Anderson says, "That's a lot of grazing pressure at one time, so each fresh strip didn't last very long. Therefore, the animals needed to be moved to four or five fresh strips each day to meet their intake demands."

Because of the abnormally wet spring—water standing in areas—Anderson says the cattle generated a lot of mud. He says, "Normally I don't worry too much about muddying up a small piece of pasture. If the animals are on that piece of pasture no more than one day, it usually recovers quite well, although a little slowly."

However, he adds, "Unfortunately, my livestock water system required that cattle walk back to water over previously grazed strips during a two to three day period before a fresh water site was available. This extra traffic caused severe damage during time periods when the ground was soft throughout the time it was exposed to cattle. So I had areas of nearly bare ground near watering points while the last strip grazed before moving watering points remained in good shape."

Of his experience, Anderson concluded, "Mob grazing and soft, wet pastures do not mix—at least not when the pasture will be exposed to cattle for more than one day."

Anderson notes that he plans to alter future mob grazing plans—he's going to try it on some warm-season grass pasture on higher ground and will try it on brome pastures again—but only when soils are dry and firm.

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SAVE THE DATE for these Upcoming Grazing Events

Nebraska Ranch Practicum accepting registrations

The 2011 Nebraska Ranch Practicum gives ranchers cutting edge research in range livestock production from the University of Nebraska-Lincoln. Natural resources, livestock management and economic reality are integrated throughout the Practicum.

During the three-season UNI Extension class, participants have the opportunity to expand their knowledge with an overview of ranching practices from new angles. Throughout the program, participants will cover a variety of topics including the effective use of decision support tools to evaluate management and marketing alternatives, plant identification, range conditions and grazing strategies, wildlife management, evaluation of cow body condition scores and beef cattle production systems.

Classroom activities will open and close the Practicum in North Platte with the remainder of the classes conducted at UNI's Gudmundsen Sandhills Laboratory, a working

ranch with education and research facilities, near Whitman. The 12,800 acre ranch provides hands-on experience to ranchers. Practicum dates are June 8 and 9, July 7, Sept. 7 and 8, and Nov. 3, 2011, and Jan. 4 and 5, 2012 for the eight-session class. Scheduling of the sessions from June to January is designed to cover the production cycle of both livestock and forage resources.

The 2011 Nebraska Ranch Practicum can count for college or continuing education credit. Participants looking to earn credits should make arrangements during the initial session.

Applications are due May 2, 2011 with a \$250 deposit. Enrollment is limited to 35 participants and applicants will be notified of their status no later than May 16. Deposits will be refunded if space is not available. The balance of \$400 is due June 8 for those enrolled in the class. The total cost of \$650 includes educational materials, noon meals and breaks. Travel and lodging are to be handled privately.

For applications or additional information, contact Brent Plugge at 308-236-1236, e-mail bplugge@unlnotes.unl.edu or visit <http://gsl.unl.edu/nebraskaranchpracticum>.

NMSU youth ranch management camp

The New Mexico State University (NMSU) Cooperative Extension Service is seeking youth ages 15 through 19 to participate in a unique summer experience June 5-10 at the Valles Caldera National Preserve. Twenty-five youth will be selected to attend the New Mexico Youth Ranch Management Camp where they will receive training in all aspects of ranch management.

"The camp is tailored to be one of the most unique educational experiences these kids may ever see, even in their college career," says Manny Encinas, NMSU Extension beef cattle specialist.

He adds, "There are other youth ranch camps throughout the country, but this one is tailored to introduce the participants to new concepts and ideas, advanced technologies and applied skills that are used

on commercial beef cattle operations. They will be learning some of the cutting-edge practices. Hopefully, this camp will be an opportunity for young people to see that there are career opportunities in this area of agri-business."

The youth will participate in a wide variety of hands-on field experiences and lectures. Early in the week, John Wenzel, NMSU Extension veterinarian; Eric Schalljager, NMSU ruminant nutritionist; and Encinas will address beef cattle health, handling, nutrition and reproduction. Participants will have the opportunity to work with Jack Thomas, NMSU meat scientist, to fabricate a beef carcass into wholesale and retail cuts of beef.

Midweek, NMSU range management specialists Chris Allison and Nick Ashcroft will provide instruction on range management, plant identification and stocking rates. Sam Smallidge, NMSU Extension wildlife management specialist, along with state wildlife management experts, will provide a broad-scope program on wildlife management.

Stan Beevers, ranch economist with Texas A&M University, will lead the cattle marketing session, where the youth will gain a well-rounded perspective of ranch economics and the dynamics of purchasing and marketing cattle.

"Participants will leave this experience with a greater appreciation for not only new skills and practices, but also the economics of each practice as it relates to cash-flow for a ranch," Encinas says. Throughout the week, participants will work in teams and ultimately present a ranch management

plan before a review panel to compete for prizes and scholarships.

"This program is not just for FFA and 4-H members," Encinas said. "It is for any youth who has an interest in the areas of ranching, range management, wildlife habitat management and cattle marketing."

Partnering with the Extension Service in providing the camp are Beef Industry Improvement of New Mexico, the New Mexico Cattle Growers Association and the Valles Caldera National Preserve.

Applicants should contact Patrick Torres, Santa Fe County Extension agriculture agent, at 505-471-4711 or visit the camp's website at <http://nmyrm.nmsu.edu> for information and to submit an online application. Applicants must submit a completed application that includes a short essay on what they expect to gain from attending the camp. Applications are due May 1. A panel of industry leaders will review the applications and select the participants. Successful applicants must submit a \$250 camp fee by June 1.

America's Grasslands Conference Aug. 15-17 in Sioux Falls

America's Grasslands: Status, Threats and Opportunities will bring together researchers, natural resource professionals, agricultural producers, policy experts and conservationists to discuss the status of North America's grassland ecosystems and the outlook for those ecosystems in a changing climate.

The conference, to be held at the Sheraton Hotel and Conference Center in Sioux Falls, will be immediately followed by a Grass-

lands Policy Summit on Aug. 17/18, sponsored by the National Wildlife Federation and Ducks Unlimited.

For more information email SDSU's Susan Rupp at susan.rupp@sdstate.edu.

Range Beef Cow Symposium Nov. 29-Dec. 1 in NE

The 23rd Range Beef Cow Symposium (RBCS) will be held Nov. 29-Dec. 1 in Mitchell, Neb. This popular educational event for cattle producers started in 1969 at Chadron, Neb., and is held every other year.

The RBCS is organized by the animal science departments of Colorado State University, the University of Nebraska-Lincoln, South Dakota State University and University of Wyoming. The event rotates between Colorado, western Nebraska, western South Dakota and Wyoming.

Focusing on beef production issues in the Western states, the RBCS regularly attracts 800 to 1,200 attendees and more than 80 agribusiness booth vendors for the three-day event. One of the most popular aspects of the RBCS are the nightly "Bull Per Sessions," where the invited speakers are brought back as panelists and are available for informal question-and-answer sessions each evening of the symposium.

The speaker agenda, registration and lodging details are still being finalized, but participants are encouraged to mark the dates and plan to attend the 2011 Range Beef Cow Symposium Nov. 29-Dec. 1.

For more information contact Karla Jenkins at (308) 632-1245 or kjenkins2@unl.edu.

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Grassfed Exchange will show financial opportunities for successful graziers

With corn prices continuing to rise, many cattle producers are looking at ways to put pounds on cattle without paying the high cost of corn. As input costs rise, producers must question the overall feasibility of the current model of corn-fed cattle and profitability. If cattle prices should fall after the cost of higher inputs of corn, producers would find themselves with a serious problem. So the real question is: With input prices so high, what can a producer do to protect themselves from a future drop in cattle prices?

Even though most beef cattle spend at least part of their lives on grass, corn is an established part of the beef industry when finish-

ing the animals for market. It is at this stage of beef production, known as finishing, that the cost of corn is creating a quandary for some producers.

This quandary is the focus of an upcoming seminar for cattle producers in Norfolk, Neb. The event will be held on Sept. 16-17, 2011 at the Northeast Community College Ag Complex. Some of the topics will include:

- Methods for consistent gains on grass
- Genetic expression and the relationship to environmental influences
- Holistic animal health management
- Land & Livestock opportunities

With corn prices at \$7, having the ability to custom

graze cattle and get consistent gains will give every cattle producer an extra potential source of income. In the current economy, this can make a significant impact to our communities especially in rural areas.

The Grassfed Exchange www.grassfedexchange.com was founded in 2009 to promote grass-fed beef for the social good of our land, our consumers, and our communities. The GFE provides information for both consumers and producers and encourages the exchange of ideas, as well as works towards development of strategies to increase the value of the grass-fed industry. For more information about the upcoming seminar, visit www.grassfedexchange.com or call Caro Peters at 402-682-4866.



Advice for controlling Eastern Red cedars

Eastern Red cedar trees seem to be exploding in many pastures. These trees reduce forage production, make animal handling difficult, and encourage pastures to shift from warm-season to cool-season grasses.

Cedar control can be achieved using herbicides, cutting, or fire, according to Bruce Anderson, University of Nebraska Extension forage specialist. By far the least expensive, when it can

be used safely, is fire. But the effectiveness of fire declines as trees get large. Herbicides like Spike, Tordon, and Velpar applied directly to the soil beneath the tree work very well, but they're time consuming and more expensive. While cutting can be less expensive, it is even more time consuming, especially if cut trees need to be removed.

Recent research in Nebraska has shown that

a combination of control measures can make use of the strengths of each method while overcoming most disadvantages.

For best results, a prescribed fire is needed to kill many smaller trees and to weaken or improve accessibility to larger trees. It also can be used periodically, maybe every four to eight years, to eliminate new infestations, suggests Anderson.

After the prescribed burn, it usually is best to wait a year before using herbicides or cutting to

complete the job because some trees that appear to survive the fire will die. This minimizes the number of trees to cut or treat with herbicides.

Local Extension offices should have a circular with more information to help you rid your grasslands of this pest.

Controlling early spring weeds in native grasses, too

How do you get rid of weeds like downy brome and smooth brome in native grass? Herbicides, fire, and grazing all are options in the right situation, Anderson says.

Anderson notes you must realize that seed of these grasses lasts about three years in the soil, so the problem may repeat itself for several years. In grasslands dominated by warm-

season grasses, one option is to spray 1 pint per acre of glyphosate, like Roundup, early in the spring after the weedy bromes green up but before warm-season grasses start growing. This should solve the problem for this year and knock out other early weeds like bluegrass without harming your warm-season grasses. Another option is to use 4 to 6 ounces of Plateau herbicide or its generics and get similar results. And with Plateau, residual herbicide activity also will control some later emerging weeds as well.

A prescribed burn just as warm-season grasses begin to grow also controls these weeds but you must be careful and have a burning permit.

If herbicides or fire are not desired the job is

tougher. You need to limit seed production with grazing. Begin grazing as soon as these bromes green up this spring, which come quite early in the season. Graze very hard to keep seedheads from developing as long as possible, says Anderson. Eventually these grasses will form heads just an inch or two above the soil surface and grazing no longer will help.

Now comes the tough part. You must remove your animals from this area for a month to six weeks to let the desired grass grow and regain some vigor. Feed hay if necessary. Repeat this hard early grazing during the next couple springs and you should start seeing results, Anderson concludes.

Nebraskan wins top honors for rangeland conservation

Jeff Nichols, Resource Conservationist with the USDA Natural Resources Conservation Service (NRCS) in North Platte, Neb., was recently named National Rangeland Conservationist of the year.

The Rangeland Conservationist of the Year award recognizes professionals who have exhibited superior accomplishments in rangeland conservation. One winner is selected from nominated NRCS professionals from across the nation.

Nichols began his career with NRCS as a Soil Conservationist after graduating from the University

of Nebraska-Lincoln in 1990 with a degree in Agronomy - crop production and range management. He started his career with NRCS in Schuyler, Neb., and then was transferred to Chadron, Neb. A year later, he was promoted to a Range Management Specialist position in Ogallala, Neb. In 2009, he moved to his current position as a Resource Conservationist in the North Platte NRCS Field Office.

According to Nichols, the best part of his career has been helping farmers and ranchers manage their natural resources.

"The thing I enjoy most is working with landowners and having that exchange of ideas - being able to learn from them about their operation, and then share my ideas and technical assistance with them."

"Seeing the success of a landowner implementing a grazing system or invasive plant control strategy that improves their rangeland and the bottom line of the operation is a rewarding feeling," Nichols said.

Nichols has worked with many ranchers to help them improve their rangeland, one of which was

rancher, Mike Kelly. Nichols assisted the Kelly Ranch with developing grazing management strategies for improving ecological conditions and production along the Birdwood Creek in McPherson County.

Kelly said, "Jeff has always been a dedicated professional that offers

sound advice in a cordial and helpful manner. He is respected both among area ranchers and peers. I especially admire his work ethic and enthusiasm for his job. It is obvious that he has a love of the land. Professionals such as Jeff truly help keep ranchers on the land."



Jeff Nichols of North Platte, Neb. was recently named National Rangeland Conservationist of the year.

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LET'S GO BIRDING

June 17-18

South Dakota Grassland Coalition will host a bird tour at the Headley Ranch at White Lake, S.D.

Cost is \$20 a person or \$35 a couple. Students high school age and under are free. Registration can be sent to Justin Jessop at 24690 299th Ave, Presha, SD 57568. Or contact him for more information by calling (605) 280-0127 or email jjessop@sdcgrassland.org.



Roundup Ready Alfalfa varieties available

At least 23 seed companies are marketing 38 Genuity Roundup Ready alfalfa varieties, all approved by the National Alfalfa and Miscellaneous Legumes Variety Review Board (NAVRRB).

The variety information, in table form listing pest resistance information, was obtained from the Association of Official Seed Certifying Agencies (AOSCA) and the NAVRRB and can be viewed online at <http://www.alfalfa.org/variety-leaflet.php>.

The Roundup Ready alfalfa varieties range from 3 to 9 in fall dormancy, with a majority of varieties

available in full dormancy 4. Growers in regions of the country ready to plant have or soon will receive delivery of newly bagged seed sent from bulk storage in the West, according to several seed company representatives.

America's Farmers Mom of the Year

Behind every American farm family is the backbone of the operation: the farm mom. Monsanto is honoring her contributions to her family, farm, community and industry with the 2011 America's Farmers Mom of the Year program.

Applications will be accepted through Mother's Day at AmericasFarmers.com. Five regional winners will be announced May 16, when winners' profiles and nominations will be posted

on the website. Each regional winner will receive a \$5,000 cash prize from Monsanto, and the farm mom receiving the most online votes by May 26 will receive an additional \$2,500 and the title of America's Farmers Mom of the Year 2011.

To be eligible, a mom must be at least 18 years of age and work on a working farm or livestock operation. Anyone can submit a nomination by visiting the America's Farmers website and explaining in 300 words or fewer how their favorite farm mom embodies the farm family way of life. Nominations will be judged by Monsanto and American Agri-Women (AAW), a national coalition of women's farmer, ranch and agribusiness organizations.

Complete eligibility requirements and official rules for America's Farmers Mom of the Year can be obtained online at www.AmericasFarmers.com or by sending a self-addressed, stamped envelope to America's Farmers Mom of the Year Program, 914 Spruce Street, Saint Louis, MO 63102.

iPhone apps for weeds, grazing

The South Dakota Cooperative Extension Service has developed two new applications that owners of iPhones or iPod Touch devices can download and use. The applications, or apps, include "South Dakota Rangeland and Pasture Grazing Records," and "Noxious Weeds of South Dakota."

The grazing records app was designed to help

ranchers and grassland managers keep accurate records of grazing use and to keep track of changing conditions in pastures and rangeland. The noxious weeds app features an easy-to-use guide for both statewide and locally noxious weeds, and it can help landowners identify the species of weeds.

Both apps are available for free download on Apple's iTunes Store.

Download the noxious weeds app at: <http://itunes.apple.com/WebObjects/MZStore.woa/viewSoftware?id=405068319&mt=8>.

Download the grazing records app at: <http://itunes.apple.com/app/sdcas-grazing-records/id405068391?mt=8>. Staff from SDSU's AgBio Communications Unit developed and published

the apps with input from Extension experts in the fields of weed identification and rangeland management.

Guide identifies 350 weeds

Weeds of the Midwestern United States and Central Canada is a quick reference guide for identifying and managing potentially problematic plants. The guide features more than 1,400 full-color photographs and provides essential information on more than 350 troublesome weeds and invasive plants.

The book retails for \$39.95 and includes over 1,400 photographs. For ordering information visit the North Central Weed Science Society's website at www.ncwsn.org.

Fencing options

Rotational grazing systems have a need for fencing systems that are easily moveable.

Electric fences are great options for those who need to move their cattle quickly and efficiently without breaking the back moving fencing.

The new fencing products available to the livestock industry will also help assure your management plan is low stress to your animals and you.

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For more information, call 800-527-0990 or visit www.twinmountainfence.com.

Pivotal Posts

Soon irrigation season will be here. If you need allow your pivot irrigation system to cross over different sections of your rotational grazing system, a



pivotal post may be a solution.

The Pivotal Post from Pivotal Fencing Systems makes cross-fencing center pivots possible without building gates or letting wires down to allow the sprinkler to pass through fences. You can see the Pivotal Post in action at www.pivotalpost.com.

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Rangeland and Soil Days June 21-22

The South Dakota Rangeland and Soils Days will be an opportunity to learn more about two of the most important resources in the state – soils and rangelands. The event will be held June 21-22 at Ft. Reeder Army in Lemmon, S.D. and will offer a host of learning activities designed for a variety of age groups and expertise, from 8 years old through adult.

Divisions for the Rangeland Days are determined by expertise level and age as of January 1: New Ranger (8-10 years), Wranglers (11-13 years), Scouts (14-18 years, who have little or no range judging experience), Go Getters (14-18 years), and Old Rangers (adult).

After a day of active learning, the participants will have the opportunity to measure how much they have learned by participating in a contest. Competitions and awards are as follows:

Student Talks: Talks may be presented on any aspect of range management or about any range resource. Visual aids are required: PowerPoint preferred. Scout and Go Getter presentations

should be more scientific than a revised 4-H demonstration. Time limits are: New Rangers 2-8 minutes, Wranglers 3-8 minutes, Scouts and Go Getters 5-8 minutes.

The top Scout or Go Getter who resides in South Dakota may be given the opportunity to present his or her presentation at the International Society for Range Management meeting to be held in Spokane, Wash. January 29-February 2, 2012.

Range: All materials needed for study will be provided at registration. Competition is individual and team for all age groups. Teams may consist of three or four member from the county 4-H program or FFA Chapter. New Ranger and Wrangler teams will receive certificates. The top Go Getter team in 4-H will represent South Dakota at the National Land and Range Judging Contest held in Oklahoma City, Okla. in May 2012.

Student Displays: Youth are also encouraged to enter a tabletop display on any range-related topic. Examples include: wildlife,

food and habitat displays, or a grazing plan for your ranch. Plant collections will be judged as a separate category, and will be eligible for a special award, but will not count toward the Top Hand Award.

Top Hand Awards: The overall top scoring youth in each division will receive a silver belt buckle. Score accumulated in the judging competition, student talks, and displays will count towards the award. Participation in all three events is required.

Participants may pre-register by June 1 with the Perkins County Conservation District. Both days are \$25 each. Teams will be designated at the Armory during final registration June 21st from 8:30-9:30 a.m. For questions, call 605-244-5222 ext. 3.

Both Rangeland and Soils Days are hosted by Perkins County Conservation District, Grand River Grazing Association, SDSU Cooperative Extension Service, Natural Resources Conservation Service, Forest Service, Tatanka Resource Conservation and Development Council, Inc.