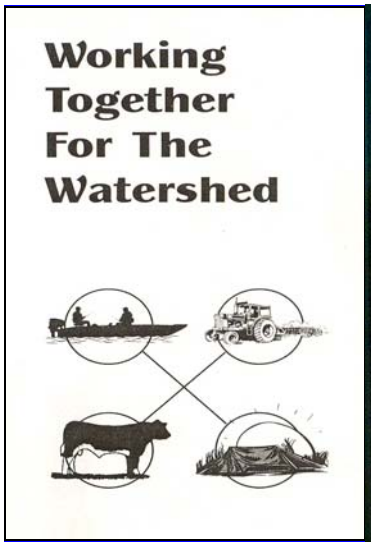
Lake Poinsett Watershed Project

Segment One Final Report

Section 319 Nonpoint Source Pollution Control Program

Sponsored by
Hamlin County Conservation District
Hayti, South Dakota

Report Prepared by
Richard Smith,
Project Coordinator



July 1, 2007

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Grant Numbers: 9998185-98, 9998185-99, 998185-03

Acknowledgments

The Lake Poinsett Watershed Project wishes to thank each of the partners which have supported the distribution of information and contributed to the implementation of best management practices in the Lake Poinsett watershed.

Local Partners

All the individual landowners that voluntarily implemented practices
Lake Poinsett Water Project District
Lake Poinsett Sanitary District
Lake Poinsett Development Association
Hamlin County Conservation District
Kingsbury County Conservation District
Brookings County Conservation District
Hamlin County Livestock Improvement Association
Kingsbury County Cattlemen Association
Hamlin County Cooperative Extension Service
Hamlin County Publishing (Castlewood, Hayti and Estelline)
Dakotan Newspaper (Bryant)
Watertown Public Opinion
KWAT radio (Watertown)
Dakota Farmer Magazine
East Dakota Water District

Statewide Partners

South Dakota Grassland Coalition
South Dakota Association of Conservation Districts
South Dakota Lakes and Streams Association
South Dakota Society of Range Management
South Dakota Game, Fish and Parks
South Dakota Department of Agriculture
South Dakota State University Range Science Department
South Dakota Board of Water and Natural Resources
South Dakota Non-point Pollution Task Force
South Dakota Department of Environment and Natural Resources

National Partners

Ducks Unlimited
United States Fish and Wildlife Service
United States Dept of Agriculture- Farm Service Agency
United States Dept of Agriculture- Natural Resource and Conservation Service
United States Environmental Protection Agency

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EXECUTIVE SUMMARY

PROJECT TITLE Lake **Poinsett Watershed Project**

GRANT NUMBER 9998185-98, 9998185-99, and 998185-03

PROJECT START DATE **4/21/98** PROJECT COMPLETION DATE **7/01/07**

FUNDING:

EPA 319 GRANTS	$751,949
TOTAL EXPENDITURES OF EPA FUNDS	751,949
TOTAL ELIGIBLE LOCAL MATCH	813,057
OTHER FEDERAL (USDA-EQIP)	35,816
TOTAL PROJECT COST	$1,600,822

SUMMARY OF GOALS AND IMPLEMENTATION METHODS

The Lake Poinsett watershed project goal is:

> "Restore Lake Poinsett to ensure the long-term full realization of all designated uses of the lake."

The Lake Poinsett Assessment (1995) identified an annual phosphorus load to the lake of 33,642 pounds with retention of 14,205 pounds. Based on resources available, a 20 percent reduction in both nutrient and sediment loading was established. When additional funding became available, the goal was increased to 40 percent for both pollutants.

The following activities were completed during this segment of the projected ten year restoration effort:

1. lake shore and stream bank stabilization,
2. proper lawn fertilizer and pesticide use promotion,
3. construction practices erosion control,
4. construction of small dams to catch sediment originating from cropland,
5. nutrient load reduction from livestock feeding operations,
6. construction of grassed waterways in cropland areas,
7. minimum till practice use promotion,
8. conversion of highly erodible cropland acres to permanent cover,
9. installing filter strips and livestock exclusion practices in riparian areas, and
10. rotational grazing system development.

The estimated phosphorous load reduction accomplished during this project segment is shown in the following table. The reductions were realized from implementing best management practices in priority areas identified during the watershed assessment.

Reductions achieved from shoreline stabilization are considered as one time or permanent reductions and are not included in annual reduction rates. Feedlots outside of the project priority area, but within the upper watershed, are also referenced but not included in priority area reductions totals.

Estimated Phosphorus Load Reductions Achieved in the Priority Area

BMPs	**Amount installed**	**Load Reduction**	
Annual Reduction Practices in Priority Area		**Sediment Tons/yr**	**Phosphorous lbs/yr**
Residue Mgt Plan	2,060 acres	7,213	3,606
Grass Established	5,331 acres	26,655	13,327
Grazing Plans	1,350 acres	10	80
Sediment Dams	385 acres	1,925	962
Streamside buffer	90 acres	455	227
Grass Waterway	11 acres	54	27
Priority Area Feedlots *	8 lots-1,400 head		700
Total Annual Reduction		**36,312 Tons/yr**	**18,929 lbs/yr**
Additional Practices and Reductions Accomplished			
Shoreline Stabilization **	12,000 LF	120,000 Tons	4,800 lbs
Watershed feedlots closed or constructing systems outside the project priority area ***	13 lots- 3,700 head		1850 lbs/yr

* The watershed assessment identified 11 feedlot sites in the project priority area as having a medium to low impact. During the current project segment, two feedlots installed animal waste management systems; four closed; two eliminated discharge to any surface water; and three elected not to install systems at this time.

** Represents one time or permanent load reductions by stabilizing erosion conditions

***These lots feed a combined total of more than 3,000 animal units.

The phosphorous load reduction realized from the 21 feedlots constructing systems or closing, including 8 of 11 identified during the assessment, totals a calculated 2,550 pounds per year.

The BMPs implemented reduced phosphorus load to the lake from the watershed by 56 percent (=18,929 lbs/yr) based on calculation of the reductions using the Universal Revised Soil Loss Equation (RUSLE2). The reduction exceeds the 40 percent (= 13,360 lbs/yr) reduction established attain the project goal.

Additional activities being implemented to attain and maintain full use of Lake Poinsett include:

1. construction of a centralized sewer system for lake residences,
2. annual harvest and removal of rough fish,

3. improve water quality in upper watershed chain of lakes, and
4. maintain the flow control structures between the Big Sioux River and Lake Poinsett to prevent poorer quality river water from negatively impacting the lake.

The Phosphorus reduction milestone was reached. The current South Dakota Integrated Report lists the lakes in full support of all assigned beneficial uses. Therefore, the project goal was attained.

Introduction

The Lake Poinsett Watershed Project (LPWP), sponsored by the Hamlin County Conservation District, was developed to implement practices which will lead to sustained beneficial use attainment of the lakes and streams in the Lake Poinsett watershed. Since the project began during 1998, LPWP has formed partnerships with individuals, organizations and governmental agencies to implement the practices.

Water Quality Evaluation

The Lake Poinsett Watershed Implementation Project is a total maximum daily load (TMDL) implementation strategy designed to improve and/or maintain the water quality of Lake Poinsett, Lake St. John, Lake Norden, and Lake Albert (Figure 1). Lake Poinsett is a 7,868 acre glacial lake with a 287,628 acre watershed. The watershed is located in Hamlin, Kingsbury, and Brookings Counties. Lakes Norden, Albert, and St. John are located in the watershed above Lake Poinsett. Additional natural lakes located in the watershed upstream of Lake Poinsett include Marsh Lake, Dry Lake, and Thisted Lake. Lake Poinsett is last in the chain of lakes outlets to the Big Sioux River approximately three miles to the east. Dry Lake, located on the north branch of the Lake Poinsett watershed, is connected to the Big Sioux River by the Boswell Diversion. The Diversion was constructed to route floodwaters to Dry Lake and then Lake Poinsett. Control gates are used to prevent poor quality water from the Big Sioux River from entering Dry Lake.

Lake Poinsett is on the 2006 303(d) list *(South Dakota Integrated Report For Surface Water Quality)*. The report lists the lake as a category 4 "water impaired but has an approved TMDL". Lakes Norden, Albert, and St. John are included on the 303(d) list as priority one waterbodies, and "impaired requires a TMDL". Preparation of TMDLs for these lakes is near completion. The designated beneficial uses of Lakes Poinsett, Norden, Albert, and St. John are shown in Table 1.

Table 1. Beneficial Use Support Status: Lakes Poinsett, Albert, Norden, and St. John.

Designated Beneficial Use:	**Lake**			
	Poinsett	**Albert**	**Norden**	**St. John**
Warmwater Marginal Fish Life	NA	yes	yes	yes
Limited Contact Recreation	yes	yes	yes	yes
Immersion Recreation	yes	yes	yes	yes
Fish/Wildlife Propagation, Recreation, Stock Waters	yes	yes	yes	yes
Warmwater Semipermanent Fish Life	yes	no	no	no

NA- Not Applicable

All of the lakes, except Poinsett, are non-supporting for at least one designated beneficial use. Nonpoint source pollution is the identified as the source of impairment in the 2006 *SD Integrated Report on Surface Water Quality*.

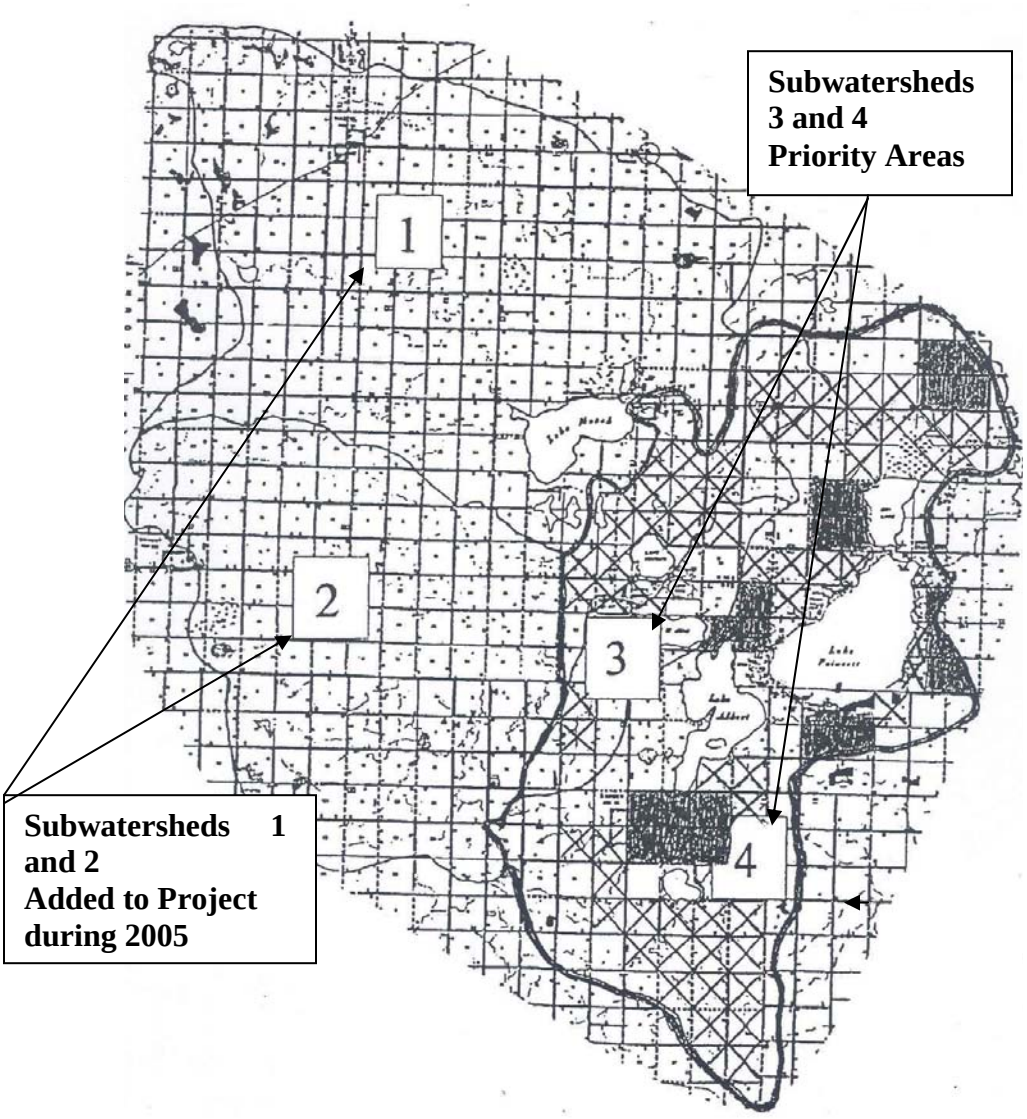


Figure 1. Lake Poinsett Watershed Project map showing subwatersheds.

Watershed Information

The Lake Poinsett watershed is located in the Prairie Choteau sub-ecoregion of the Northern Glaciated Plains Ecoregion. The gently to steeply rolling landscape has a poorly defined drainage pattern that formed over cretaceous sedimentary rock overlain by approximately 500 feet of glacial drift. Many of the soils in the watershed were formed in loess that overlies the drift while others were formed in alluvium. Figure 2 identifies the location of soils with characteristics conducive to leeching or erosion in the priority area.

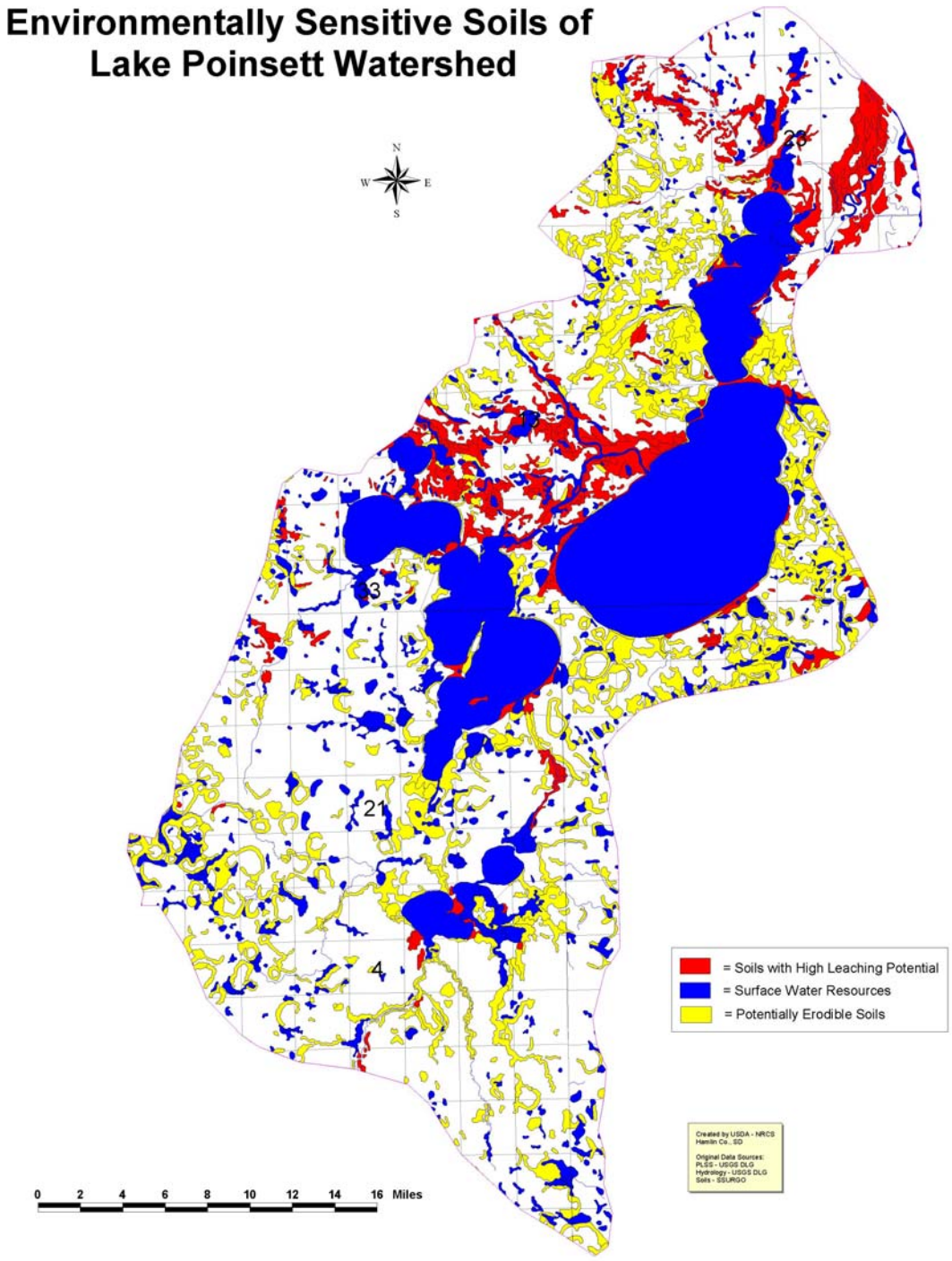


Figure 2. Segment one priority area (environmentally sensitive) soils.

Average annual precipitation in the watershed is 22-24 inches, with 75 percent of the total being received as rain during April through September. Snowfall averages 25-30

inches per year. Runoff originates primarily from heavy thunderstorms and spring snow melt.

The sub-humid conditions and relatively cooler, higher elevations, in relation to surrounding areas, support a tall grass prairie community. Numerous temporary and seasonal wetlands found throughout the project area provide habitat for waterfowl production and migration.

Land use in the watershed is predominantly agricultural. Land ownership is 95 percent private. See Tables 2 and 3 respectively. The physical attributes of the lakes are shown in Table 4.

Table 2. Land Use For the Lake Poinsett Watershed.

Land Use	Acres	Percent of Total Acres
Cropland	175,500	61
Pasture/Range Land	49,428	17
Wildlife Land	50,000	17
Other: Farmstead, Roads, etc	12,700	5
Total:	287,628	100

Table 3. Land Ownership in the Lake Poinsett Watershed.

Land Ownership	Acres	Percent of Total Acres
Privately Owned	275,275	95.7
City Owned	185	0
County Owned	102	0
SD Game, Fish & Parks	8,400	2.8
State Owned (other)	265	0
Federally Owned	3,401	1.5
Totals:	287,628	100.0

Waterbody Description

Lakes Poinsett, Albert, Norden, and St. John, each contribute to the economic and social values to the region. These include recreation, wildlife habitat, and residential living. The watershed is located in the Prairie Pothole region. The region is characterized by natural lakes and semi-permanent wetlands. Other natural lakes in the watershed include: Marsh Lake, Lake Mary, Dry Lake, Thisted Lake, and Badger Lake.

Each of the eight lakes in the Lake Poinsett watershed chain plays a role in capturing sediment and nutrients as runoff water fills and flows through them. See Figure 3.

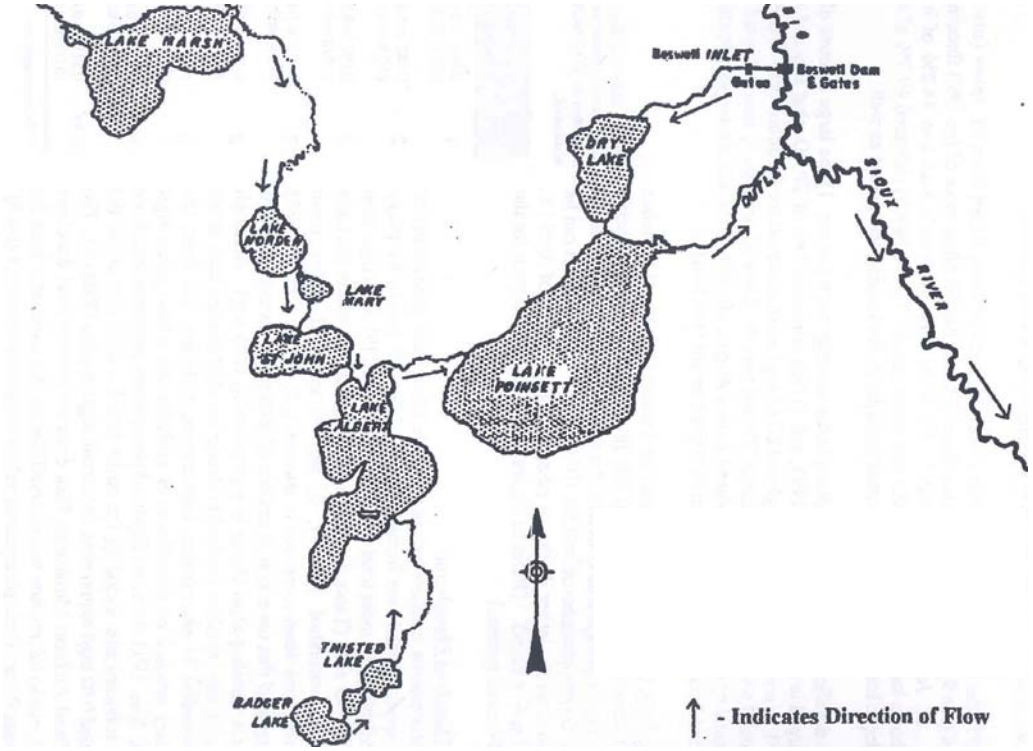


Figure 3. Lake Poinsett and connected waters.

Table 4. Physical Attributes of the Four Lakes in Priority Area.

Attribute	Lake			
	Poinsett	**Albert**	**Norden**	**St. John**
Surface Acres	7,868	3,500	746	1,200
Average Depth (Ft.)	9.5			
Drainage (acres)	287,628 (44,628 acres direct flow only)	244,000 (43,000 acres w/o Marsh, Norden, St. John, included)	188,724 (89,993 acres w/o Marsh Lake)	201,500 (12,500 acres w/o Norden and Marsh)
County	Hamlin and Brookings	Hamlin and Kingsbury	Hamlin	Hamlin
TMDL Status	Established	Needed	Needed	Needed
Trophic State Index	Hypereutrophic	*	*	*
Outlets to	Big Sioux River	Lake Poinsett	Lake St. John	Lake Albert

* To be determined.

Lake Poinsett:

Lake Poinsett, a 7,868 acre glacial lake, is one of the largest natural lakes in South Dakota. The natural outlet is a three mile long channel to the Big Sioux River. The lake receives most of its inflow directly from the Dry Lake subwatershed located to the north and Lake Albert located to the southwest.

The lake, located on the east side of highway 81, is 20 miles south of Watertown (population = 25,000) and 25 miles northwest of Brookings (population = 20,000). The communities closest to the lake are the communities of Estelline (pop. = 650 and seven miles east) and Lake Norden (population = 425 and seven miles west).

The natural Lake Poinsett watershed encompasses 287,628 acres. An additional 470,000 acres of drainage were added during 1929 with the construction of the Boswell Diversion. The Boswell Diversion consists of two gated structures and a two mile excavated channel intended to use Lake Poinsett and Dry Lake for floodwater storage when flood conditions exist on the Big Sioux River. The South Dakota Department of Game, Fish and Parks (SDGF&P) is responsible for the diversion and related structures. GF&P recognizes the impact that lower quality Big Sioux River water would have on water quality in Dry Lake and Lake Poinsett. Therefore, the diversion system has been rendered inoperable for high volume diversion.

A Flood Control Permit was issued during 1987 by the South Dakota Water Management Board for the construction of flood control gates at the Lake Poinsett outlet. The natural, physical characteristics of the outlet area would allow lower quality Big Sioux River water to backflow through the outlet with flood waters from the river. The permit requires the gates be operated in a manner to prevent lower quality Big Sioux River water from entering Lake Poinsett. The flood control gates are operated by the Lake Poinsett Water Project District.

Lake Poinsett is developed for recreation and commercial use with approximately 625 residences and 10 businesses located around the lake. SDGF&P maintains four developed public access areas at the lake.

Lake Albert:
Lake Albert, located southwest of Lake Poinsett, is a natural lake with a surface area of 3,500 acres. The lake, which is located in Hamlin and Kingsbury Counties, outlets to Lake Poinsett by a channel that is approximately one mile long. Lake Albert receives overflow waters from Lake Marsh, Lake Norden, Lake Mary and Lake St. John. Lake St John flows directly to Lake Albert from the northwest while the Lake Badger/ Thisted Lake watershed enters from the south. Because of Lake Albert's location in the chain of lakes it receives runoff waters from 244,000 acres of the total 287,828 acre Lake Poinsett Watershed.

Lake Albert is close to the communities of Badger (population = 130; location five miles south) and Lake Norden (population = 425; location four miles northwest). Public access facilities at Lake Albert include a dock, boat ramp, and restrooms.

Lake St. John:
Lake St. John, a 1,200 acre natural lake with a drainage area of 201,500 acres, is located less than ¼ mile from Lake Albert.

The lake, located below Lake Norden and Lake Marsh, receives outflow water from these lakes. Lake St. John has a drainage area of 12,500 acres when the drainage areas of Lake Norden and Marsh are excluded. No improved public facilities are located at St. John.

Lake Norden:
Lake Norden is a 746 acre natural lake located near the City of Lake Norden. The lake has a 188,724 acre drainage. It outlets to Lake St. John located 1.5 miles to the southeast. Public facilities at the lake include a city park, boat ramp and restrooms.

Water Quality Problem

Frequent algae blooms occur at Lakes Poinsett, Albert, St. John, and Norden. The blooms, linked to excessive nutrients from the watershed, hinder recreational activities at the lakes during the high use periods of the year.

Data collected during the Diagnostic/Feasibility Study (1995) indicates that:

- Lake Poinsett is a hypereutrophic lake approaching eutrophic conditions,
- the trophic state is related to phosphorus, which is the limiting nutrient, and
- in comparison to other watersheds in Eastern South Dakota, the sediment and nutrient loadings to Lake Poinsett are low.

The Lake Poinsett TMDL, developed during 1996, has an end point of "158 tons of total lake algal biomass and a 40 percent reduction in total phosphorus". The TMDL is consistent with the recommendation made if the watershed assessment report, "reduce phosphorus loading from the watershed by 40 percent".

Phosphorus from the watershed enters Lake Poinsett through inlets from Lake Albert and Dry Lake. The phosphorus load sources to Lake Poinsett by sub-watershed were determined to be.

- Lake Albert - 73 percent,
- Dry Lake - 24 percent, and
- failing septic systems - 3 percent.

Flood waters from the Big Sioux River have not been routed to the lake through the Boswell Diversion or reverse flow at the outlet of Lake Poinsett during recent years. There have, however, been times when the flood stage of the Big Sioux River exceeded the height of the control gates and overflows to Lake Poinsett. The phosphorus concentration of the Big Sioux River has consistently been at least three and sometimes 10 times the concentration measured at the inlet from Lake Albert.

To reduce nonpoint source (NPS) pollution to Lake Poinsett, the watershed study recommended the installation of best management practices (BMPs) targeted to critical watershed cells and feedlots as the most cost effective way to reduce the sediment and nutrient loads entering the lake. The recommendations targeted sub-watersheds 3 and 4 for implementation practices (in the lower watershed, and sub-watersheds 1 and 2 for diagnostic/ feasibility studies (Figure 1). Final Reports for these studies are expected during calendar year 2007.

The BMPs recommended to reduce nutrient loading from subwatersheds three and four were:

- construction of animal waste management systems at five animal feeding areas to reduce phosphorus loading by five percent. An additional six feeding areas were identified as significant potential sources of loading and fourteen feeding areas identified as in need of clean water diversions (123 total feeding areas assessed – 1996 Study),
- implement integrated crop management on 10,000 acres of cropland,
- improve grazing management on 1,500 acres, and
- expand the existing centralized sanitary sewer system at Lake Poinsett.

  Of the 622 cabins at the lake, 153 are currently connected to a centralized sanitary system.

The actions recommended to reduce sediment and phosphorus loading associated with soil erosion included:

- lake shoreline stabilization and management - 4,000 LF,
- riparian demonstration sites - 2,
- crop residue management Plans - 10,000 acres,
- grassed waterways on cropland.- 45,000 LF,
- filter strips and/or grassed buffers - 500 acres,
- small ponds or dams on tributaries – 75 sites,
- wetland restoration - 80 acres, and
- public awareness program to inform landowners about BMP installation, project goals and progress.

Project Activities

Activities completed to attain the project goal during this project segment are described in this section of the report.

Objectives, Milestones and Accomplishments

Objective 1. Reduce Nutrient Loading.

Task 1. Improve land management to reduce runoff potential of nutrients applied.

Product 1. Comprehensive Nutrient Management Plans (CNMPs)

Milestone: CNMP plans for 6,000 acres

Accomplished: The milestone was exceeded. CNMPs were developed for nine ag waste systems that apply manure to 12,182 acres. See Appendix A for example of plans. Landowners, both with and without livestock, became aware of the benefit and importance of managing nutrient application to croplands as a result of the activity.

Task 2: Facilitate implementation of grazing management through planning and infrastructure development.

Product 2. Construct cross fences to facilitate grazing rotations.

Milestone: Thirty miles of fence.

Accomplished: During the project, 10 miles of cross fence was installed. Many cooperating producers had previously installed cross-fence (Figure 4) but limited water sources prevented fully implementing rotational grazing practices. This need was addressed by shifting cost-share funds and planning assistance from fencing to water sources. The action supported reaching the milestone(s) for improved grazing management.

Figure 4. High tensile power cross fence for rotational grazing.

Product 3. Provide water development to implement rotational grazing.

Milestone: Two water systems.

Accomplished: Twenty water systems with multiple watering facilities were installed. (Figure 5). The ability to provide water on demand to multiple paddocks was a component of all grazing plans developed. Sun-resistant above ground pipeline was determined to be an alternative producers could use to provide the water in an efficient, adaptable manner. Funds for the increased number of water systems were provided by the South Dakota Conservation Commission, USF&W and the reallocation of project funds not used for cross fence.

The Hamlin County Conservation District maintained an inventory of the pipe and fittings to provide livestock grazers in areas surrounding the watershed boundary local access to the product. Over 200,000 feet of pipe were installed as a result of project's promotion and demonstration of effective grazing management practices.

Figure 5. Pasture tank with pipeline delivery.

Product 4. Design grazing plans to sustain both livestock and land resources.

Milestone: Develop grazing plans for 1,500 acres.

Accomplished: Managed grazing plans were developed for 3,500 acres of pasture.

The acreage milestone was exceeded after the milestones for water and fence were amended to reflect need. Many producers attended tours and workshops to learn the basics of grazing management. The producers used the information to improve grazing management.

It is estimated that producers who manage 10,000 acres within the watershed and 40,000 acres outside of watershed boundaries have taken advantage of attending these educational opportunities and are using the knowledge gained to improve their grassland resources. See Appendix A for example of a grazing plan.

Task 3. Construct Ag Waste Systems or modify existing feedlots to contain nutrient runoff.

Product 5. Ag waste systems.

Milestone: Original milestone amended from eleven to 24 when additional funds became available.

Accomplished: During the project, 21 total feedlots either had systems constructed, closed operation or changed operation to eliminate discharge.

Six large systems consisting of lagoons, evaporative ponds, sediment basins (Figure 6**)** and three small systems (clean water diversions, vegetative treatment areas, and feedlot layout adjustments) were constructed. Cost of the systems increased during the project. Two producers made adjustments to their feeding operation so that they no longer discharge to any water source. Five large (300+ head) and five small (less than 300 head) feedlot operators closed the facility. The operators of three of the operations in the priority area elected not to participate. See Appendix A for example Contract/Letter of Agreement for Animal Waste System.

Figure 6. Dairy facility with animal nutrient system installed.

Objective 2. Reduce Sediment Loading.

Task 4. Shoreline and streambank stabilization.

Product 6. Stabilize eroding shorelines.

Milestone: Lake Poinsett- 4,500 feet of shoreline

Accomplished: 12,000 feet of shoreline were stabilized using geotextile fabric with rock on natural rocky shorelines (Figure 7) or steel sheet piling in areas with natural sand beaches (Figure 8). The milestone was exceeded because of greater

than anticipated participation by Lake Poinsett homeowners when the effectiveness of the practice was demonstrated during the spring 2001 flood (Figure 9). The Lake Poinsett Water Project District continued funding the cost-share practice after the practice milestone and budget were exceeded. See Appendix A for example Letter of Agreement/ Understanding for Shoreline Stabilization and Checklist prior to Construction

Figure 7. Two years after stabilization using geotextile fabric and field rock.

Figure 8. Construction of steel sheet pile wall on natural sand beach.

Figure 9. Flood level waves deflected by submerged steel wall.

Task 5. Stream/Riparian Demonstration sites

Product 7. Demonstrate the benefits of rock crossings.

Milestones: Two demonstration sites

Accomplished: Rock crossings were installed at seven sites to allow passage of livestock across streams without damaging streambanks (Figure 10). Although installed to provide livestock traffic lanes the crossings are durable enough for equipment traffic. The geotextile fabric overlain by rock and gravel provides a solid base and does not interfere with water flow. Landowners have noted a change in livestock behavior after the crossings were installed. Livestock no longer crossed at new locations.

Figure 10. Rock crossing of small stream in flood plain.

Product 8. Encourage natural vegetation after livestock exclusion and stabilization methods for critical areas.

Milestone: Specific milestone not established for riparian zones in the PIP.

Accomplished: Three miles along lake shoreline (Figure 11) and four miles along tributaries (Figure 12) representing 114 acres of riparian area were placed under 15 year CRP contracts.

The marginal pasture land continuous CRP (CCRP) program became available during the project period. CCRP, plus cost share funds to install fence from the project, resulted in excluding livestock from lakeshores and streambanks throughout the watershed. Five of seven grazing operations that allowed livestock access to lakeshores at start of project participated.

Figure 11. Livestock exclusion fence installed to protect lake shoreline.

Figure 12. Streambank two years after livestock were excluded.

Task 6: Crop residue management.

Product 9. Develop residue management plans for highly erodible farm land**.**

Milestone: 2,000 acres under continuous residue management

Accomplished: Residue management plans for 3,000 acres were developed. Residue management plans are required by USDA for fields with greater than 33 percent highly erodible soils. This criterion was applicable to most of the critical cells identified in the priority area during the watershed assessment. A highly

erodible classification of soils in these cells was a factor for the land being accepted for enrollment in CRP with the result that many of the areas were seeded to permanent vegetation. (Figure 13). The Hamlin, Brookings and Kingsbury County Conservation Districts each have no-till drills available for rent. Producers in the project area introduced to no-tilling using these drills often bought their own after experiencing the advantages of improved water management, reduced erosion and fuel savings from less tillage. See Appendix A for an example of a residue management plan.

Figure 13. No-till soybeans planted in corn residue.

Task 7. Stop gully erosion in cells identified using AGNPS cells.

Product 10. Grassed waterways.

Milestone: 45,000 feet

Accomplished: Twenty four thousand feet of grassed waterways (Figure 14) were constructed.
Several areas identified as in need of a waterway were enrolled in whole field CRP contracts. This reduced the need to construct grassed waterways as a separate BMP.

Figure 14. New waterway with erosion control in place.

Task 8. Establish grass on critical cropland acres to eliminate erosion and filter runoff.

Product 11. Plant grass on erosive soils being annually cropped.

Milestone: Grass establishment - 500 acres

Accomplished: Acres of perennial vegetation planted totaled 5,331 acres. Land with erosion linked to continuous annual cropping activities reduced erosion an average of five tons/ac. by planting grass. Establishing perennial grass provided use as pasture, hay land or wildlife habitat. Project staff provided information about grass species, fertility requirements and planting techniques to maximize sustainability of the practice. The grass planted (Figure 15) was often used to improve grazing practices which reduce sediment erosion, compliment the use of rotational grazing and benefit wildlife on existing pastures.

Figure 15. New grass seeding on eroding cropland.

Task 9. Construct small dams and ponds to contain sediment.

Product 12. Locate and install multi-purpose small dams or ponds to be used as sediment traps and/or watering facilities.

Milestone: Fifty small dams or ponds

Accomplished: Eleven sediment control dams were constructed. Sites identified as in need of sediment control dams (Figure 16) were those with high erosion rates related to cropping practices. Many of the fields were enrolled in the CRP programs during the project period. Converting cropland to grass reduced the sediment erosion rate and the need to construct sediment dams. In addition, the presence of potential Topeka Shiner habitat restricted locating and constructing dams or ponds within floodplains as planned. Using pipeline to supply livestock water also provided higher quality water and was a more accepted practice than ponds.

Figure 16. Small pond constructed to trap sediment from upstream cropland.

Task 10. Demonstrate the uses of alternative water sources for riparian areas.

Product 13. Alternative livestock water.

Milestone: Two alternative type water sources

Accomplished: Four nose-pumps were installed. The Hamlin Conservation District supplied nose-pumps for producers to try at stream or river locations. Only one nose-pump (Figure 17) continues in operation. Installation of above ground pipeline from more dependable water sources has replaced the others. The activity was successful. Awareness of streambank erosion resulting from livestock drinking directly from streams was increased and operators installed a BMP to reduce NPS pollution from this source.

Figure 17. Nose-pump installed to provide a water source away from streambank.

Task 11. Restore previously lost or drained wetlands to their natural state of filtering systems.

Product 14. Restored Wetlands.

Milestone: Eighty acres

Accomplished: During the project, 471 acres of drained or impaired wetlands were restored to provide natural filters and sediment traps (Figure 18). The total includes 231 acres of farmed wetlands enrolled in the CRP Farmable Wetland Program to provide buffer areas. At one site, (Figure 19) a half mile section of stream oxbows which had been cutoff when flood waters cut a new channel was restored.

Figure 18. Wetland restored using a Wetland Reserve Program easement.

Figure 19. Restored wetlands and oxbow system.

Objective 3. Public Awareness and Education.

Task 12 Provide information on water quality issues, BMPs and cost share assistance.

Product 15. Informational brochure.

Milestone: One brochure – 9,000 copies

Accomplished: Three thousand copies of an informational brochure (Figure 20) were printed and mailed to all landowners within the project area or placed in local businesses, distributed at local Farm Shows, and made available at project tours and workshops. Newsletters were used as a supplement to the brochure to keep information current during the project. Mailed surveys were used to evaluate individual shoreline interest, sewage waste systems, and workshop/ tour values to attendees. See Appendix B for examples and returns.

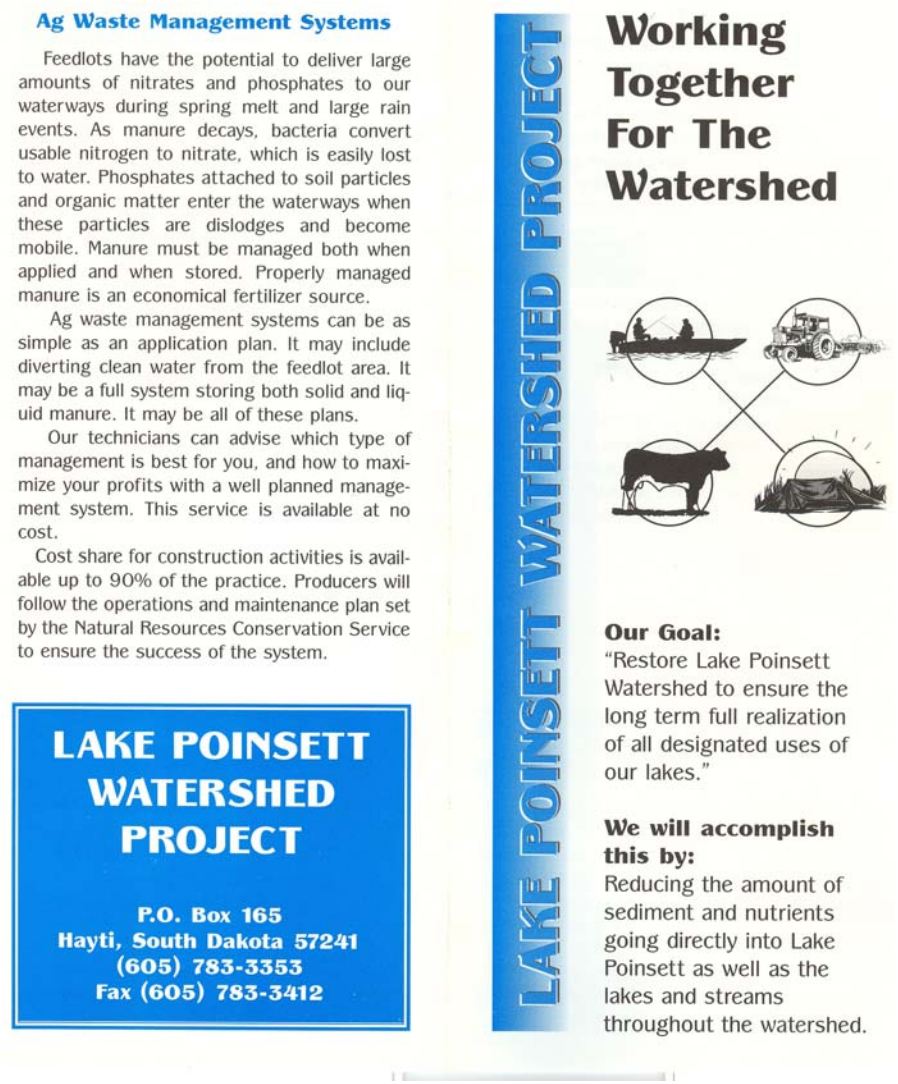


Figure 20. Promotional brochure example.

Product 16. Public information meetings.

Milestone: Eight meetings

Accomplished: Seven workshops (Table 5) sponsored by project were used to present information on the benefits and application of grazing management (Figure 21), options for animal waste system design, balanced nutrient management for crop production (Figure 22), and soil quality management through use of crop rotations and reduced tillage. See Appendix C for examples of promotional materials.

Table 5. Workshops Held.

Workshops Sponsored by Project			
Date	**Concern**	**Topic Covered**	**Number Attending**
Feb 2001	Sediment Reduction	Grazing management	32
Jan 2002	Nutrient & Sediment	Soil Quality Factors	39
Jan 2003	Sediment Reduction	Grazing management	60
Aug 2003	Nutrient & Sediment Reduction	Soil Identification Components	55
Feb 2004 2-days	Sustaining Environmental Quality	Holistic Resource Management (Grazing and Farm management)	40 each day
Feb 2005	Nutrient Reduction	Manure and Commercial Fertilizer Management	40
Mar 2006	Sediment Reduction	1st Annual Coteau Area Grazing Conference for Rotational Grazers	315

Figure 21. First Annual Coteau Grazing Conference.

Figure 22. Livestock producers attending a manure workshop.

Product 17. Public tours.

Milestone: Six tours.

Accomplished: Thirteen tours (Table 6) were sponsored to showcase the effectiveness of BMPs installed. The tours were used as summer follow-ups to training provided during the winter months. Grazing management tours (Figure 23) were the most popular with the participants requesting additional tours each year. It was found that producers that had implemented BMPs for their operations were some of the best promoters for the practices. The project hosted field trips for the South Dakota State University Range Science classes (Figure 24) so that students could observe the impacts on of grazing practices on water quality. 4-H members participated in a native plant identification tour and were shown the importance of perennial vegetation in protecting water sources from contamination (Figure 25).

Table 6. Public Tours.

Date	Concern	Topic viewed	Number Attended
Nov 2000	Nutrient Reduction	Animal Waste Systems	18
July 2001	Sediment Reduction	Rotational Grazing	55
July 2001	Public Information	4-H / Native Grass ID	14
July 2001	Public Information	NPS Task Force	15
June 2002	Sediment Reduction	Rotational Grazing	52
Sept 2002	Sediment Reduction	Shoreline Stabilization	15
June 2003	Nutrient & Sediment	Grazing and Feedlot	41
Aug 2004	Sediment Reduction	Native grass rotation	58
July 2005	Nutrient Reduction	Pasture Fertility Plots	51
July 2006	Sediment Reduction	SD Grassland Coalition Tour-Partner sponsor	62
2004 2005 2006	Public Information	SDSU Range Science Class - Water Quality Tour	12 14 15

Figure 23. Producer grazing tour.

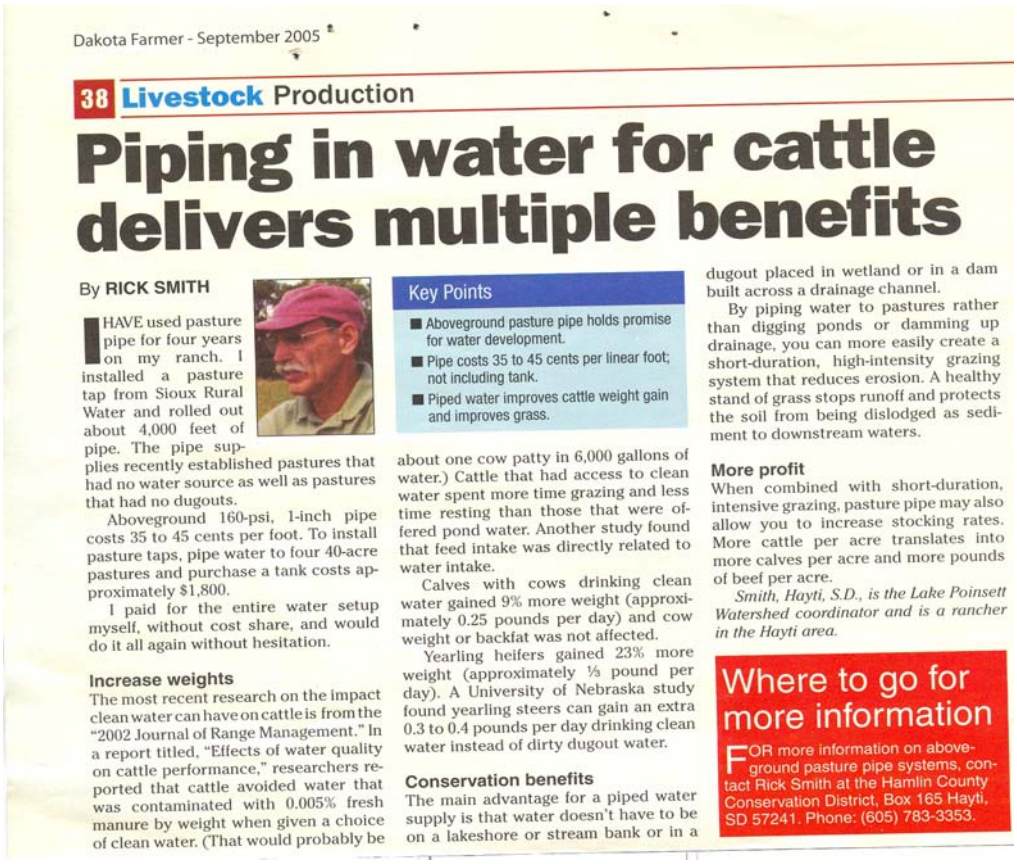
Figure 24. SDSU Range Science students touring project.

Figure 25. 4-H members learn to identify native plants.

Product 18. Media updates.

Milestone: Twenty media and public updates

Accomplished: The coordinator provided the print, radio and television press with information about the project activities and water quality issues. Fourteen radio appearances and seven hours of radio time inform were used to inform the public of the project's purpose and upcoming events for them to attend. Updates and water quality related articles were written for local newspapers, lake associations' newsletters, internet list servers and agricultural magazines. See Appendix D for examples of print material published. The coordinator made presentations to over 1700 individuals at 35 organizational meetings as part of the outreach program.



Dakota Farmer - September 2005

38 Livestock Production

Piping in water for cattle delivers multiple benefits

By RICK SMITH

I HAVE used pasture pipe for four years on my ranch. I installed a pasture tap from Sioux Rural Water and rolled out about 4,000 feet of pipe. The pipe supplies recently established pastures that had no water source as well as pastures that had no dugouts.

Aboveground 160-psi, 1-inch pipe costs 35 to 45 cents per foot. To install pasture taps, pipe water to four 40-acre pastures and purchase a tank costs approximately $1,800.

I paid for the entire water setup myself, without cost share, and would do it all again without hesitation.

Increase weights

The most recent research on the impact clean water can have on cattle is from the "2002 Journal of Range Management." In a report titled, "Effects of water quality on cattle performance," researchers reported that cattle avoided water that was contaminated with 0.005% fresh manure by weight when given a choice of clean water. (That would probably be about one cow patty in 6,000 gallons of water.) Cattle that had access to clean water spent more time grazing and less time resting than those that were offered pond water. Another study found that feed intake was directly related to water intake.

Calves with cows drinking clean water gained 9% more weight (approximately 0.25 pounds per day) and cow weight or backfat was not affected.

Yearling heifers gained 23% more weight (approximately ⅓ pound per day). A University of Nebraska study found yearling steers can gain an extra 0.3 to 0.4 pounds per day drinking clean water instead of dirty dugout water.

Conservation benefits

The main advantage for a piped water supply is that water doesn't have to be on a lakeshore or stream bank or in a dugout placed in wetland or in a dam built across a drainage channel.

By piping water to pastures rather than digging ponds or damming up drainage, you can more easily create a short-duration, high-intensity grazing system that reduces erosion. A healthy stand of grass stops runoff and protects the soil from being dislodged as sediment to downstream waters.

More profit

When combined with short-duration, intensive grazing, pasture pipe may also allow you to increase stocking rates. More cattle per acre translates into more calves per acre and more pounds of beef per acre.

Smith, Hayti, S.D., is the Lake Poinsett Watershed coordinator and is a rancher in the Hayti area.

Key Points

- Aboveground pasture pipe holds promise for water development.
- Pipe costs 35 to 45 cents per linear foot; not including tank.
- Piped water improves cattle weight gain and improves grass.

Where to go for more information

FOR more information on aboveground pasture pipe systems, contact Rick Smith at the Hamlin County Conservation District, Box 165 Hayti, SD 57241. Phone: (605) 783-3353.

Figure 26. Articles by coordinator featured in regional agricultural magazines.

Product 19. Signs at project sites.

Milestone: Eighteen signs

Accomplished: No signs were erected. Many of the locations of non-point source practices installed were inaccessible to the public. In addition, the project area did not have a common or central physical site that the public frequented and therefore would lend itself to effective public notice for project updates. The use of newsletters, newspapers and public appearances at local association meetings were used to keep public informed of project status.

Monitoring and Evaluation

A comparison of the milestones planned versus accomplished is shown in Table 7. Except as indicated, all milestones as amended were exceeded.

Table 7. Planned versus Accomplished Milestone Comparison.

Products	Planned	Accomplished	Status
Nutrient Control:			
Integrated Crop Mgt. (acres)	6,000	12,182	Exceeded
Grazing Management (acres)	1,500	3,500	Exceeded
Ag Waste Systems (sites)	11 amended to 24 in 2005	21 built, closed or changed management	Exceeded
Sediment Control:			
Shoreline Stabilization (LF)	4,500	12,000	Exceeded
Riparian Demos (sites)	2	7	Exceeded
Crop Residue Mgt. (ac/yr.)	2,000	3,000	Exceeded
Filter Strips/Grass Seeding (acres)	500	5,331	Exceeded
Small Dams/Ponds (each)	50	11	Reduced *
Alternative water sources (each)	2	20	Exceeded
Wetland Restoration (acres)	80	471	Exceeded
Information and Education			
Brochures (# distributed)	9,000	3,000	Reduced **
Public Meetings (#)	8	10	Exceeded
Public Tours (#)	6	10	Exceeded
Project Progress Signs (#)	18	0	***
Watershed Newsletters	Not planned	15	Added

* Because of economic feasibility for alternative water sources and small dams impacting the endangered Topeka Shiner this milestone was reduced.

** Replacing brochures with 15 newsletters provided a better method of keeping the public updated on project activities.

***An appropriate, available location for signage was not located.

Monitoring for most BMPs involved photographs of the existing condition, construction or BMP application process and results after establishment of vegetation or improvement of condition. These photographs s helped describe the process and desired end result at workshops or public information meetings.

While water quality samples were collected after rain events or during spring snow melt, the absence of consistent tributary flows occurring because of the dry climatic conditions experienced during the last five years of project period limited use of the data.

Data yielded from water samples data collected on defined tributaries to Lakes Norden, John, Albert and Poinsett to evaluate Phosphorous concentrations and Total Solids is listed in Table 8.

Table 8. Water Quality Data

Site	Receiving Lake	Date	Total P mg/L	Total Solids mg/L	E.Coli/100 ml
Albert Outlet	Poinsett	9/99	0.275	1,422	30
.		4/01	0.267	1,141	<1
Dry Lake Out.	Poinsett	5/99	0.495	247	345
John Outlet	Albert	5/01	0.371	880	<10
		5/06	0.490	2,240	77
SE inlet	Albert	5/01	0.544	433	20
		7/04	0.471	416	7,100
		6/06	0.362	1,912	40
Norden Outlet	John	6/06	0.80	1,335	10
SW Inlet	John	6/05	0.458	2,225	30
		6/06	0.481	2,782	194
W Inlet	John	7/04	1.49	1,328	10,800
		6/05	1.04	3,156	548
		6/06	1.32	3,866	44
Dolph Creek	Norden	9/99	0.578	1,459	4,800
		7/04	0.101	685	2,900
		6/05	0.442	1,190	727
		5/06	0.294	1,663	345
Haug Bridge	Norden	6/05	0.200	1,118	231
		5/06	0.157	1,370	185

Areas where more extensive implementation of BMPs and evaluation occurred were the tributaries to Lake Norden. Although limited, the data suggests improvement of both P and Ecoli concentrations but not total solids. Sample from two tributaries to Lake John indicated elevated levels of both Phosphorous and total solids. As these tributaries may be influenced by NPDES permitted facilities, the data has been provided to the DENR Surface Water program.

Sediment load reductions were obtained by using the Revised Universal Soil Loss Equation (RUSLE2) to estimate effectiveness of practices based on soil type and delivery rate for implemented practice versus previous use. See Table 9. Corresponding Phosphorous reductions were based from soil fertility sample results of the actual eroding material. On average the tests indicate 0.5 pounds available P per ton of eroded material indicating the high levels of accumulated Phosphorous on the soil surface vs. 0.032 lbs P per ton in six inch deep soil tests. Feedlot data was calculated using the Michigan Department of Environmental Quality Training Manual for Section 319 Watersheds.

Estimated load reductions achieved calculated using the methods described are shown in Table 9.

Table 9. Estimated Load Reductions Achieved in the Priority Area

BMPs	Amount installed	Load Reduction	
Annual Reduction Practices in Priority Area		**Sediment Tons/yr**	**Phosphorous lbs/yr**
Residue Mgt Plan	2,060 acres	7,213	3,606
Grass Established	5,331 acres	26,655	13,327
Grazing Plans	1,350 acres	10	80
Sediment Dams	385 acres	1,925	962
Streamside buffer	90 acres	455	227
Grass Waterway	11 acres	54	27
Priority Area Feedlots *	8 lots-1400 head		700
Total Annual Reduction		**36,312 Tons/yr**	**18,929 lbs/yr**
Additional Practices and Reductions Accomplished			
Shoreline Stabilization **	12,000 LF	120,000 Tons	4,800 lbs
Watershed feedlots closed or constructing systems outside the project priority area ***	13 lots- 3,700 head		1850 lbs/yr

Based on calculations of the reductions using the Universal Revised Soil Loss Equation (RUSLE2), the BMPs implemented reduced the phosphorus load to the lake from the watershed by 56 percent (=18,929 lbs/yr). The reduction exceeds the 40 percent (= 13,360 lbs/yr) reduction determined necessary to attain the project goal.

The 2006 South Dakota Integrated Report lists Lake Poinsett as fully supporting all designated beneficial uses. The project goal was attained.

Budget/Expenditure Comparison

A comparison of project expenditures versus planned is shown in Table 8.

Table 10. Budget /Expenditures / Match

BMPs		Combined EPA Grants Budget	EPA Spent	Other Federal	Local Match	Total Spent Excluding other Federal
Grazing Management		23,575				
	Fence		4,963		10,535	15,498
	Alternate Water		13,341		25,009	38,350
	Grass Seeding		2,033		19,432	21,465
Animal Waste System		229,847	246,763	35,815	208,329	455,092
Shoreline Stabilization		107,850	107,196		496,414	603,610
Riparian Stream Cross		7,000	8,413		13,497	21,910
Grass Waterways		14,500	14,160		13,641	27,801
Dams		28,800	25,343		30,824	56,167
BMPs total		411,572	422,212		817,681	1,239,893
Public Awareness						
Lake Fertilizer		400	0		-	0
Brochures		0	40		-	40
Meetings/Workshops		1200	2641		4,573	7,214
Tours/ Workshops		1800	161		137	298
Signs		650	0		-	0
Media Info		500	26		26	52
Public Awareness Total		4550	2868		4,736	7604
Administration Tech Assistance						
Salary/ Workman Comp		311000	310,618		-	310,618
Travel		6727	7,101		-	7,101
Office Supply/Equip		4,500	4,571		3,063	7,634
Training		1,450	103		-	103
Secretary		5,250	3,620		10,860	14,480
Testing /Impact Sample		6,900	856		565	1,421
Admin/ Personnel Total		335827	326,869		14,488	341,357
In Kind Time	Board/ LLO Plan				36,300	36,300
Project Total		**751,949**	**751,949**	**35815**	**873,205**	**1,625,154**
					MATCH identified	
		match required		eligible match recorded		
Grant 9998185-98	$ 213,152	142,101		309,771.26		
Grant 9998185-99	$ 510,797	340,531		503,286.67		
Grant 9998185-03	$ 28,000	18,667		-		
Total Grants	$ 751,949	**501,299**		**813,057.93**		
Local Cash Match Partners						
SD Consolidated Water		120,003				
Lake Poinset Water Project District		109,623				
Conservation Commission Grant		73,752				
SD Game Fish & Parks		3,500				
Various Tour/ Workshop Supporters		5,022				
Local Landowners		483,640				
Hamlin Co. Conservation District		17,517				
		813,057				

The budget was amended by moving funds within t6asks to better accommodate installing the BMPs that supported attaining the project goal and were, at the same time, accepted by the producers. Specifically, portions of the funds for cross fencing and pond construction were moved to above ground pipelines to implement rotational grazing.

What Worked and Didn't Work

The project outreach/public awareness program increased watershed resident's support for the project and knowledge of how their actions affect water quality.

The project hosted workshops and tours so that landowners could learn about and experience firsthand the results from installing BMPs. The activity which proved the most effective in ensuring good attendance was a direct mailing, followed by an article describing the event in several local papers, a guest appearance on local radio stations and finally a telephone call to producers that had been targeted as in need of addressing resource concerns. Soliciting sponsors for meals at or transportation to the events became easier as attendance at the events grew in size and area represented. Local sponsors began to provide additional cost share funding for BMPs which demonstrated improvement to Lake Poinsett water quality.

To gain participation in installing the BMPs required to attain the goal, activities were designed to focus on three areas of concern, which correspondingly affected three distinct groups of participants.

1. Shoreline stabilization focused on lake homeowners, many of whom are part time residents. Members of this group were the most difficult of the three groups to contact, as most have permanent residences 40 to 700 miles from the watershed, are only available on weekends and are frequently new home buyers that are not familiar with Lake Poinsett or Hamlin and Brookings county agencies.

   While shoreline erosion around Lake Poinsett was a recognized property use issue by homeowners losing lake side property during flood events, during the project those same homeowners learned that the eroding banks were also having a negative impact on the lake's water quality. By forming a partnership with engineers and local contractors, a cost effective program, when compared to previous individual attempts, was developed to stabilize shorelines with locally available materials. To view the guidelines, access:

   www.state.sd.us/denr/DFTA/WatershedProtection/WQProjects/ShorelineGuidelines.ppt

   The combination of being able to protect their property, the lake and receive cost share funds for doing so, resulted in the milestone for this activity being exceeded by a factor of 2.7.

The shoreline stabilization activities lead to discussions of other sources of pollution (fertilizer, detergents and yard wastes) to Lake Poinsett and how those sources can be managed. This resulted in homeowners requesting that local lawn and garden suppliers stock phosphate free lawn fertilizer. Lake residents also became involved with county issues dealing with industrial development, zoning regulations and agricultural drainage from the standpoint of how it would affect Lake Poinsett water quality in the future.

2. Producers with grasslands were the most receptive agricultural group with which the project partnered. It was found that many livestock producers in the area did not judge they had been exposed to the concept in terms relevant to the humid, cooler, higher rainfall conditions in the glacial coteau of eastern South Dakota as opposed to the semi-arid range conditions in central and western portions of the state.

   The success with grazing management was projected to be related to a combination of the availability of technical assistance from NRCS and South Dakota State University range management specialist and technicians, 319 funded Grasslands Project staff, the project coordinator's rotational grazing experience, and cost share funds available from several sources. The combined efforts of the partners resulted in the development of several grazing systems that are being managed by producers who have a new outlook and attitude toward grasslands. These producers have become spokespersons who encourage livestock producers to develop their grazing resources. Culminating rotational grazing outreach activity was the 2006 Coteau Grazing Conference which was attended by over 300 land managers.

   Many of the producers that had interaction with Lake Poinsett Watershed Project grazing management activities continue to add and make improvements to their grazing systems.

3. Feedlot operators were originally the most skeptical of the three groups when asked if they were interested in installing BPMs. It became apparent during the early stages of the project that several of the feedlots would possibly close because of the age of the operator, size of the operation or alternative opportunities for the land. Therefore, the project focused on those operations that were managed by younger operators or would possibly be passed down to a younger generation with plans to keep the feedlot in operation.

   It was found that the best sales tool for animal waste systems was the demonstration of the economic value of balancing the nutrient need of crops and availability of nutrients from capturing and handling manure. In addition to manure containment, most animal waste system designs included improvements to feedlot conditions which would translate into better animal performance. These include eliminating muddy conditions and providing winter protection.

Physical location with regard to topography, groundwater and surface water sources was the primary condition that determined type, cost and feasibility of constructing an animal waste management system. Several feedlots were located over high ground water which can cause construction challenges and other limitations. In most instances it was found that relocation was more cost effective and practical than retrofitting an existing feedlot. At the end of the project new system designs, such as compost barns and vegetative treatment areas for runoff were being considered and accepted by producers.

Before the project, many agricultural, industrial or residential issues were decided without consideration of the effect on water quality. As a result of the project's public awareness and programs, these issues are considered and developed to minimize or eliminate impact to local or downstream surface waters.

Future Recommendations

During first project segment, the project implemented practices in close proximity to Lake Poinsett (Figure 1). Future nutrient and sediment load reductions in the watershed will depend on BMPs being installed in the upper reaches of the watershed. The upper reaches are similar in agricultural activity to the initial priority area. Therefore, similar BMPs are expected to be used. Animal feeding operations will require the largest financial commitment to reduce nutrient loading from the watershed. It is also anticipated that producers will explore the benefits of animal housing and manure composting as a method for livestock production to reduce climate effects on animals and also better manage manure from existing open lots. Some lakeshore areas still need stabilization and will continue using the methods established during this project segment.

The project partners' support continuing the workshops and tours to keep the public informed of BMPs and their affect on natural resources, economic sustainability and community development.

The Lake Poinsett Watershed Project has received additional 319 funds as support from existing partners to continue implementing TMDLs in the watershed.

APPENDICES

APPENDIX A

PLANS, CONTRACTS AND LETTERS OF AGREEMENT

CNMP estimate of nutrients produced from feedlot.

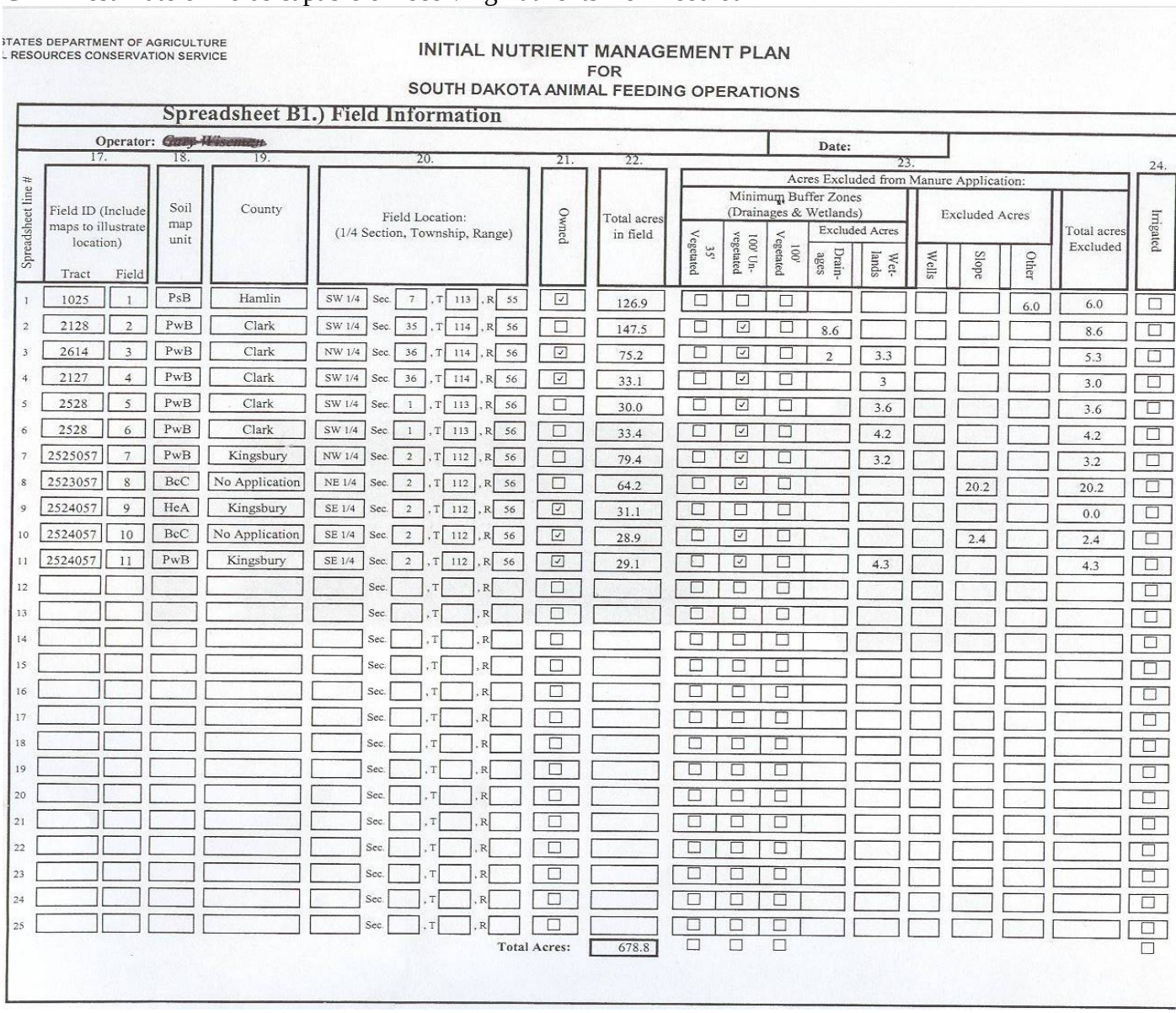
1. Operator: [redacted] | 2. County: Hamlin | 3. Prepared By: John Lentz & Tom Schumacher | 4. Date:

Spreadsheet A.) Total Nitrogen And Phosphorus Produced From Operation

Animal Type:	5. No. of animals	6. Avg. weight (lbs.)	7. N / day / animal (lbs.)	7. P_2O_5 / day / animal (lbs.)	8. Days of Confine-ment	9. N Total (lbs.)	9. P_2O_5 Total (lbs.)	10. N retained Handling/Storage	10. N retained %	11. Total N available for application (lbs.)	12. Time of application	13. N Retained Application Method	13. N Retained %	14. Total N retained in field (lbs.)	15. 3-Yr. Mineralization Rate Manure Handling	15. 3-Yr. Mineralization Rate %	16. N Available for the crop (lbs.)	16. P_2O_5 Available for the crop (lbs.)
CATTLE																		
- Dairy (system 1)																		
- Dairy (system 2)																		
- Dairy (system 3)																		
- Dairy (system 4)																		
- Beef (system 1)	600	800	0.25	0.20	210	31,248	25,200	Solid - open lot	52	16,249	Fall/Summer	Broadcast (incorp. after 5 days)	80	12,999	Solid without bedding	61	7,929	25,200
- Beef (system 2)																		
- Beef (system 3)																		
- Beef (system 4)																		
SWINE																		
- Nursery pig																		
- Growing pig																		
- Finishing pig																		
- Gestating sow																		
- Sow and litter																		
- Boar																		
SHEEP																		
- Sheep															Sheep - solid	45		
POULTRY																		
- Layers															Poultry	85		
- Broilers															Poultry	85		
- Turkey															Poultry	85		
HORSE																		
- Horse															Horses	35		
FOWL																		
- Ducks															Duck	85		
- Geese			?	?											Geese	85		

Total manure production: 28,320 lbs/day OR 5,947,200 lbs/year | Total lbs. of N and P_2O_5 available for the crop: 7,929 | 25,200

CNMP estimate of fields capable of receiving nutrients from feedlot



STATES DEPARTMENT OF AGRICULTURE
L RESOURCES CONSERVATION SERVICE

INITIAL NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Spreadsheet B1.) Field Information

Operator: [redacted] Date:

Spreadsheet line #	17. Field ID (Include maps to illustrate location) Tract	Field	18. Soil map unit	19. County	20. Field Location: (1/4 Section, Township, Range)	21. Owned	22. Total acres in field	23. Acres Excluded from Manure Application: Minimum Buffer Zones (Drainages & Wetlands) 35' Vegetated	100' Un-vegetated	100' Vegetated	Excluded Acres Drainages	Excluded Acres Wetlands	Excluded Acres Wells	Excluded Acres Slope	Excluded Acres Other	Total acres Excluded	24. Irrigated
1	1025	1	PsB	Hamlin	SW 1/4 Sec. 7, T 113, R 55	☑	126.9	☐	☐	☐					6.0	6.0	☐
2	2128	2	PwB	Clark	SW 1/4 Sec. 35, T 114, R 56	☐	147.5	☐	☑	☐	8.6					8.6	☐
3	2614	3	PwB	Clark	NW 1/4 Sec. 36, T 114, R 56	☑	75.2	☐	☑	☐	2	3.3				5.3	☐
4	2127	4	PwB	Clark	SW 1/4 Sec. 36, T 114, R 56	☑	33.1	☐	☑	☐		3				3.0	☐
5	2528	5	PwB	Clark	SW 1/4 Sec. 1, T 113, R 56	☐	30.0	☐	☑	☐		3.6				3.6	☐
6	2528	6	PwB	Clark	SW 1/4 Sec. 1, T 113, R 56	☐	33.4	☐	☑	☐		4.2				4.2	☐
7	2525057	7	PwB	Kingsbury	NW 1/4 Sec. 2, T 112, R 56	☐	79.4	☐	☑	☐		3.2				3.2	☐
8	2523057	8	BcC	No Application	NE 1/4 Sec. 2, T 112, R 56	☐	64.2	☐	☑	☐				20.2		20.2	☐
9	2524057	9	HeA	Kingsbury	SE 1/4 Sec. 2, T 112, R 56	☑	31.1	☐	☐	☐						0.0	☐
10	2524057	10	BcC	No Application	SE 1/4 Sec. 2, T 112, R 56	☑	28.9	☐	☑	☐				2.4		2.4	☐
11	2524057	11	PwB	Kingsbury	SE 1/4 Sec. 2, T 112, R 56	☑	29.1	☐	☑	☐		4.3				4.3	☐
12					Sec. , T , R	☐		☐	☐	☐							☐
13					Sec. , T , R	☐		☐	☐	☐							☐
14					Sec. , T , R	☐		☐	☐	☐							☐
15					Sec. , T , R	☐		☐	☐	☐							☐
16					Sec. , T , R	☐		☐	☐	☐							☐
17					Sec. , T , R	☐		☐	☐	☐							☐
18					Sec. , T , R	☐		☐	☐	☐							☐
19					Sec. , T , R	☐		☐	☐	☐							☐
20					Sec. , T , R	☐		☐	☐	☐							☐
21					Sec. , T , R	☐		☐	☐	☐							☐
22					Sec. , T , R	☐		☐	☐	☐							☐
23					Sec. , T , R	☐		☐	☐	☐							☐
24					Sec. , T , R	☐		☐	☐	☐							☐
25					Sec. , T , R	☐		☐	☐	☐							☐
						Total Acres:	678.8	☐	☐	☐							☐

CNMP estimate of nutrients needed for crop production

Spreadsheet B2.) Estimated Nutrient Requirement

Operator: [redacted] Date:

Spreadsheet line #	17. Field ID (Include maps to illustrate location)		25. Crops and Yield in Rotation:								26. Estimated Nitrogen requirements (lbs.)			27. Est. soil test NO_3-N (lbs.)	28. Legume N credits (lbs.)			29. Additional N needed for crops: (lbs.)				30. Total manure N allowed per field (lbs.)
			Prior year		Year 1		Year 2		Year 3													
	Tract	Field	Crop	Yield	Crop	Yield	Crop	Yield	Crop	Yield	Year 1	Year 2	Year 3		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Avg	
1	1025	1	Corn Silage (ton)	16	Corn Silage (to	16	Corn Silage (t	16	Corn Silage (to	16	166	166	166	40	0	0	0	126	126	126	126	15,282
2	2128	2	Soybean (bu)	39	Corn (bu)	139	Soybean (bu)	39	Corn (bu)	139	167	147	167	40	39	0	39	88	107	88	94	13,061
3	2614	3	Soybean (bu)	39	Corn (bu)	139	Soybean (bu)	39	Corn (bu)	139	167	147	167	40	39	0	39	88	107	88	94	6,573
4	2127	4	Corn (bu)	139	Soybean (bu)	39	Corn (bu)	139	Soybean (bu)	39	147	167	147	40	0	39	0	107	88	107	100	3,018
5	2528	5	Alfalfa (Ton)	3	Alfalfa (Ton)	3	Soybean (bu)	39	Corn (bu)	139	165	147	167	27	0	0	64	138	120	76	111	2,942
6	2528	6	Corn (bu)	139	Soybean (bu)	39	Corn (bu)	139	Soybean (bu)	39	147	167	147	40	0	39	0	107	88	107	100	2,928
7	2525057	7	Soybean (bu)	40	Corn (bu)	143	Soybean (bu)	40	Corn (bu)	143	172	150	172	40	40	0	40	92	110	92	98	7,447
8	2523057	8	Corn (bu)	91	Soybean (bu)	25	Corn (bu)	91	Soybean (bu)	25	96	109	96	40	0	25	0	56	44	56	52	2,286
9	2524057	9	Soybean (bu)	39	Corn (bu)	142	Soybean (bu)	39	Corn (bu)	142	170	147	170	40	39	0	39	91	107	91	96	2,999
10	2524057	10	Soybean (bu)	25	Corn (bu)	91	Soybean (bu)	25	Corn (bu)	91	109	96	109	40	25	0	25	44	56	44	48	1,274
11	2524057	11	Grass (Ton)	3	Soybean (bu)	40	Corn (bu)	143	Soybean (bu)	40	150	172	150	40	0	40	0	110	92	110	104	2,576
12																						
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						
21																						
22																						
23																						
24																						
25																						
																					Total N recommendation:	60,386

CNMP estimate of nutrient production and crop production need balance.

STATES DEPARTMENT OF AGRICULTURE
L RESOURCES CONSERVATION SERVICE

INITIAL NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Spreadsheet B3.) Phosphorus and Acreage Assessment

Operator: [redacted] Date:

Spreadsheet line #	17. Field ID (Include maps to illustrate location) Tract	Field	31. RUSLE predicted soil loss (SD-CPA-29) (tons)	32. Phosphorus Soil Test ppm	Olsen	Bray-1	Date (M/Y)	33. Phosphorus removal estimate (lbs.) Year 1	Year 2	Year 3	Avg.	Total/ field (lbs.)	34. Estimated time to raise P soil test level to 50 ppm Olsen or 75 ppm Bray (years)	35. Manure application based on:	36. Initial Nutrient Mgt. Plan - N based fields (acres)
1	1025	1	0.65	8	◉	○	Oct-03	69	69	69	69	8,318	3	Nitrogen need	120.9
2	2128	2	0.65	12	◉	○	Feb-04	49	30	49	42	5,895	3	Nitrogen need	138.9
3	2614	3	0.65	13	◉	○	Mar-04	49	30	49	42	2,967	3	Nitrogen need	69.9
4	2127	4	0.65	14	○	◉	Mar-04	30	49	30	36	1,091	3	Nitrogen need	30.1
5	2528	5	0.65	18	○	◉	Oct-03	36	30	49	38	1,009	2	Nitrogen need	26.4
6	2528	6	0.65	18	○	◉	Oct-03	30	49	30	36	1,058	3	Nitrogen need	29.2
7	2525057	7	0.65	6	◉	○	Mar-04	50	31	50	44	3,325	3	Nitrogen need	76.2
8	2523057	8		4	◉	○	Mar-04	19	32	19	23	1,032			
9	2524057	9	0.65	10	○	◉	Mar-04	50	30	50	43	1,342	3	Nitrogen need	31.1
10	2524057	10		4	◉	○	Mar-04	32	19	32	28	733			
11	2524057	11	0.65	4	◉	○	Mar-04	31	50	31	37	923	3	Nitrogen need	24.8
12					○	○									
13					○	○									
14					○	○									
15					○	○									
16					○	○									
17					○	○									
18					○	○									
19					○	○									
20					○	○									
21					○	○									
22					○	○									
23					○	○									
24					○	○									
25					○	○									

	N	P2O5
Total lbs of N and P2O5 available for crops:	7,929	25,200
Total lbs of N and P2O5 required by fields:	56,826	25,928

Total Acres 547.5

Adequate acres are available based on Nitrogen analysis

P2O5 removal exceeds, or is in balance with crop needs.

Grazing plan-Available forage estimate.

Address [redacted]

Lake Norden, SD 57248

Conservationist: [redacted]

Date: [redacted]

☐ Present ☑ Planned

Instructions:

AUM conversion Factors	
All Hay	2.5
Silage	1.5
Grains	3.7

Growth Curve #1	(100% cool season)	1			5	15	30	25	5	5	10	5			
Growth Curve #2	(75% cool, 25% warm season)	2			5	15	25	20	15	10	7	3			
Growth Curve #3	(50% cool, 50% warm season)	3			5	15	20	20	20	10	7	3			
Growth Curve #4	(25% cool, 75% warm season)	4			5	5	15	25	30	10	7	3			
Growth Curve #5	(100% warm season)	5					10	35	30	20	5				
Growth Curve #6	(Crop Aftermath)	6										34	33	33	
Growth Curve #7	(Create Your Own)	7													

Growth curves found in ecological site and pasture suitability group descriptions should be used when available

SUMMARY

	Acres		Feed		Grazing		TOTAL GRAZED FORAGE PRODUCTION BY MONTH											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TOTALS	153.5	TOTAL AUM's			292				12	36	64	68	52	33	20	8		
				Cumulative Totals					12	48	111	179	231	264	284	292	292	292

FEDERAL AND OFFSITE LEASES (Non Inventoried)

Tract	Lease or Field No.	Lease Description	Acres	Comments:	AUM's Available	Grow th Curve	GRAZED FORAGE PRODUCTION BY MONTH											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PURCHASED FEEDS

Feed Type	Tons Available	AUM Conv Factor	AUM's Available	Comments:

INVENTORIED LANDS (Owned and Operated)

Tract	Field No.	Landuse	ESD, FSG or CCU	Acres	Sim. Index or /Species	HARVESTED FEEDS				GRAZING LANDS		Grow th Curve	GRAZED FORAGE PRODUCTION BY MONTH										
						Tons per Acre	Tons Available	AUM Conv. Factor	AUM's Available	AUM's per acre	AUM's Available		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
890	10	Pasture	G	8.21						1.50	12.3	1			1	2	4	3	1	1	1	1		
890	10	Pasture	NS	1.97						1.00	2.0	1			0	0	1	0	0	0	0	0		
890	10	Pasture	F	5.84						2.00	11.7	1			1	2	4	3	1	1	1	1		
890	7	Pasture	NS	0.21						1.50	0.3	2			0	0	0	0	0	0	0	0		
890	7	Pasture	G	6.66						2.10	14.0	2			1	2	3	3	2	1	1	0		
890	7	Pasture	F	8.39						2.60	21.8	2			1	3	5	4	3	2	2	1		

Grazing Plan-Forage available by field and month

INVENTORIED LANDS (Owned and Operated)																								
Tract	Field No.	Landuse	ESD, FSG or CCU	Acres	Sim. Index or /Species	HARVESTED FEEDS				GRAZING LANDS		Grow-th Curve	GRAZED FORAGE PRODUCTION BY MONTH											
						Tons per Acre	Tons Available	AUM Conv. Factor	AUM's Available	AUM's per acre	AUM's Available		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
890	8	Pasture	G	12.36						1.50	18.5	2			1	3	5	4	3	2	1	1		
890	8	Pasture	NS	3.69						1.00	3.7	2			0	1	1	1	1	0	0	0		
890	8	Pasture	F	10.9						2.00	21.8	2			1	3	5	4	3	2	2	1		
890	9	Pasture	K	2.81						3.80	10.7	5					1	4	3	2	1			
890	9	Pasture	NS	1.36						1.50	2.0	5					0	1	1	0	0			
890	9	Pasture	G	9.77						1.80	17.6	5					2	6	5	4	1			
890	9	Pasture	F	8.27						2.80	23.2	5					2	8	7	5	1			
925	1	Pasture	F	5.34						2.00	10.7	2			1	2	3	2	2	1	1	0		
925	1	Pasture	B2	1.1						2.00	2.2	2			0	0	1	0	0	0	0	0		
925	1	Pasture	G	1.92						1.50	2.9	2			0	0	1	1	0	0	0	0		
925	1	Pasture	A	0.98						2.50	2.5	2			0	0	1	0	0	0	0	0		
925	1	Pasture	K	1.52						2.50	3.8	2			0	1	1	1	1	0	0	0		
925	2	Pasture	G	4.41						1.50	6.6	2			0	1	2	1	1	1	0	0		
925	2	Pasture	F	5.49						2.00	11.0	2			1	2	3	2	2	1	1	0		
925	2	Pasture	K	1.74						2.50	4.4	2			0	1	1	1	1	0	0	0		
925	3	Pasture	G	2.04						1.30	2.7	3			0	0	1	1	1	0	0	0		
925	3	Pasture	F	1.97						2.00	3.9	3			0	1	1	1	1	0	0	0		
925	3	Pasture	NS	4.5						1.00	4.5	3			0	1	1	1	1	0	0	0		
925	3	Pasture	K	0.39						2.50	1.0	3			0	0	0	0	0	0	0	0		
925	4	Pasture	NS	0.13						1.00	0.1	2			0	0	0	0	0	0	0	0		
925	4	Pasture	G	5.14						1.50	7.7	2			0	1	2	2	1	1	1	0		
925	4	Pasture	F	3.82						2.00	7.6	2			0	1	2	2	1	1	1	0		
925	4	Pasture	K	0.15						2.50	0.4	2			0	0	0	0	0	0	0	0		
925	5	Pasture	G	3.29						1.30	4.3	3			0	1	1	1	1	0	0	0		
925	5	Pasture	F	7.28						2.00	14.6	3			1	2	3	3	3	1	1	0		
925	5	Pasture	NS	2.82						1.00	2.8	3			0	0	1	1	1	0	0	0		
925	5	Pasture	B2	5.08						2.00	10.2	3			1	2	2	2	2	1	1	0		
925	5	Pasture	K	2.59						2.50	6.5	3			0	1	1	1	1	1	0	0		
2849	6	Pasture	F	5.57						2.00	11.1	2			1	2	3	2	2	1	1	0		
2849	6	Pasture	G	3.51						1.50	5.3	2			0	1	1	1	1	1	0	0		
2849	6	Pasture	K	2.25						2.50	5.6	2			0	1	1	1	1	1	0	0		

Grazing Plan-Forage need and forage availability balance

Animal Kind	Number	AU Equiv	Grazing Months	Grazing Demand	Months on Feed	Feed Demand
Cow, 1400 lb., 2 yr +	60	1.30	4	312		
			Total	312	Total	

FORAGE DEMAND PER MONTH (AUM's)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Graze	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐
Feed	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cow, 1400 lb., 2 yr +					78	78	78	78				

☑ Check the appropriate box in each month where Grazing or Feeding will be supplied. Check only one box per month.

Conclusions:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Monthly Grazing Demand					78	78	78	78				
Cumulative Grazing Demand					78	156	234	312	312	312	312	312
Total Monthly Feed Demand												
Cumulative Feed Demand												

MONTHLY FORAGE BALANCE FROM GRAZING (AUM's)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grazable Forage Produced By Month			12	36	64	68	52	33	20	8		
Grazing Animal Demand By Month					78	78	78	78				
Monthly Shortage or Surplus			12	36	(14)	(10)	(26)	(45)	20	8		
Cumulative Grazed Forage Production			12	48	111	179	231	264	284	292	292	292
Cumulative Grazing Demand					78	156	234	312	312	312	312	312
Cumulative Shortage or Surplus			12	48	33	23	(3)	(48)	(28)	(20)	(20)	(20)

FORAGE BALANCE SUMMARY

Total Grazing Available (AUM's)	292		Total Grazing Demand (AUM's)	312	Grazing Shortage or Surplus (AUM's)	(20)
Total Feed Available (AUM's)			Total Feed Demand (AUM's)		Feed Shortage or Surplus (AUM's)	
Total Grazing and Feed Available (AUM's)	292		Total Grazing and Feed Demand (AUM's)	312	Total Shortage or Surplus of Grazing and Feed (AUM's)	(20)

Grazing Plan- Field sequence rotation for grazing.

Instructions:

PLANNED GRAZING SYSTEM SCHEDULE

Cooperator: [redacted] Conservationist: [redacted] Date Planned: [redacted]

Primary gowth for Cool Season Plants

Primary growth for Warm Season Plants

Year	Tract-Field/ Past. No.	Acres	Animal Information: Animal Type	Animal Information: Number	Avail. AUM's	AUM's used
1	T-925 1	10.9	Cow, 1400 lb., 2 yr +	60	22	18
1	T-925 2	11.6	Cow, 1400 lb., 2 yr +	60	22	18
1	T-925 3	8.9	Cow, 1400 lb., 2 yr +	60	12	18
1	T-925 4	9.2	Cow, 1400 lb., 2 yr +	60	16	18
1	T-925 5	21.1	Cow, 1400 lb., 2 yr +	60	38	36
1	T-2849 6	11.3	Cow, 1400 lb., 2 yr +	60	22	36
1	T-890 7	15.3	Cow, 1400 lb., 2 yr +	60	36	36
1	T-890 8	27.0	Cow, 1400 lb., 2 yr +	60	44	55
1	T-890 9	22.2	Cow, 1400 lb., 2 yr +	60	54	55
1	T-890 10	16.0	Cow, 1400 lb., 2 yr +	60	26	36
2	T-925 1	10.9	Cow, 1400 lb., 2 yr +	60	22	18
2	T-925 2	11.6	Cow, 1400 lb., 2 yr +	60	22	18
2	T-925 3	8.9	Cow, 1400 lb., 2 yr +	60	12	18
2	T-925 4	9.2	Cow, 1400 lb., 2 yr +	60	16	18
2	T-925 5	21.1	Cow, 1400 lb., 2 yr +	60	38	36
2	T-2849 6	11.3	Cow, 1400 lb., 2 yr +	60	22	36
2	T-890 7	15.3	Cow, 1400 lb., 2 yr +	60	36	36
2	T-890 8	27.0	Cow, 1400 lb., 2 yr +	60	44	55
2	T-890 9	22.2	Cow, 1400 lb., 2 yr +	60	54	55
2	T-890 10	16.0	Cow, 1400 lb., 2 yr +	60	26	36

April				May				June				July				August				September				October				November				D
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
				X																														
					X																													
						X																												
							X																											
								X							X																			
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							X														X												
								X										X	X														
									X	X							X																
											X							X																

Residue management plan for highly erodible land.

NRCS Natural Resources Conservation Service

HAYTI SERVICE CENTER
301 MARSH ST
HAYTI, SD 57241
(605) 783-3642

JESSICA MICH/
NRC

Conservation Plan

[redacted]

Conservation Crop Rotation (328)

CONSERVATION CROP ROTATION (328) – Grow crops in a planned sequence to reduce erosion, improve soil organic matter and manage plant pests. The crop sequence will consist of a 2 year rotation. 1 year(s) of warm season grasses and 1 year(s) of warm season broadleaves will be grown. Warm Season Grasses include: corn, sorghum, sudangrass, millet, and perennial warm season native grasses. Cool Season Grasses include: winter wheat, spring wheat, barley, winter rye, oats, durum wheat, and cool season perennial grasses. Warm Season Broadleaves include: soybean, sunflower, safflower, chickpea, buckwheat and dry edible beans. Cool Season Broadleaves include: alfalfa, hairy vetch, field pea, flax, canola, mustard, crambe, lentil, sugar beet, turnips and potatoes. This crop rotation will produce a positive Soil Conditioning Index (SCI) value and will reduce erosion to acceptable levels. Refer to SD-CPA-29 and SD-CPA-53 for additional information. See http://www.nrcs.gov/technical/efotg/ or contact the local USDA-NRCS office for complete standards and specifications.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
2788	9	28 ac	4	2007		
	Total:	28 ac				

Residue and Tillage Management, Mulch Till (345)

RESIDUE AND TILLAGE MANAGEMENT; MULCH TILL (345) - Manage crop residues year round to increase plant-available moisture. Mulch tillage techniques and implements such as chisels, sweeps, and harrows will be used to distribute and orient the residue. Maintain a minimum amount of residue on the soil surface after planting as follows: 30% after planting corn and 40% after planting soybeans. See http://www.nrcs.gov/technical/efotg/ or contact the local USDA-NRCS office for complete standards and specifications.

Tract	Field	Planned Amount	Month	Year	Applied Amount	Date
2788	9	28 ac	4	2007		
	Total:	28 ac				

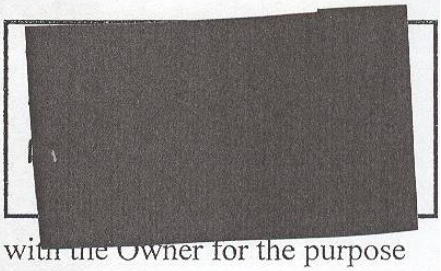
Animal Waste System agreement.

OFFICE FILE COPY

CONTRACT/LETTER OF AGREEMENT

Between

Hamlin County Conservation District
PO Box 165
Hayti, SD 57241
(hereafter referred to HCCD)



The HCCD hereby enters into an Agreement with the Owner for the purpose of implementing an Animal Waste Management System.

ARTICLE I

HCCD Responsibilities and Participation

I.1 The Natural Resources Conservation Service(NRCS) agrees to provide plans, specifications, and bid documents necessary to award a construction contract for the implementation of Animal Waste Management System on the Owner's property. The HCCD may request and receive technical assistance from the NRCS as resources are available.

I.2 The HCCD agrees to maintain fiscal authority for this contract by keeping records of all transactions and shall request eligible cost-share funds and make these cost-share payments to the contractor.

ARTICLE II

Owner Responsibilities and Participation

II.1 The owner agrees to pay to the contractor those costs in excess of the established cost-share percentages which are stipulated in Section III.1. Total preliminary estimated cost to the Owner for this project is $ 25,000, and may be subject to change.

II.2 The HCCD requires the Owner to obtain a letter of Credit from a bank or other lending institute to prove security of funds for the amount specified in Section II.1, to pay those preliminary

Cont.

estimated costs in excess of the established cost-share available from EPA 319 & State Consolidated Water funds as stipulated in Section III.1.

II.2 The Owner agrees to pay the amount specified in Section II.1 to the contractor within 30 days after completion of construction of the Owner's Animal Waste Management System.

II.4 The Owner agrees to operate and maintain the Animal Waste Management components under this contract according to the South Dakota NRCS Technical Guide. Life-span of the components of the Animal Waste Management System will be 10 years as set forth in the South Dakota NRCS Cost-Return Handbook. All items included in the atttached bid items, will remain intact for this period of time. Any alteration or changes in components of the Animal Waste Management System will be allowed only after consultation with the HCCD.

II.5 The Owner agrees to work with NRCS or a private crop consultant on developing a nutrient plan to properly utilize the nutrients contained within the storage facilities. Furthermore, the producer agrees to follow the nutrient management plan for at least 10 years (plan should be followed in perpetuity).

ARTICLE III
Understanding

III.1 It is understood by both parties to the Contract/Letter of Agreement that the cost-share rate established for the Animal Waste Management System is 75 % of eligible project costs as defined in Section III.2 to be paid by U.S. Environmental Projection Agency 319, South Dakota Consolidated Funds, and Conservation Commission Grant monies.

III.2 It is understood by both parties to this Contract/Letter of Agreement that cost eligible project activities shall be as detailed in the South Dakota Natural Resources Conservation Service Technical Guide.

III.3 It is understood by both parties to the Contract\Letter of Agreement that

Cont.

in the case of the property of which the Animal Waste Management System Project has been built upon is sold, or leased; that Section II.4 will still be adhered to. Failure to adhere to Section II.4 will require all cost-share monies to be refunded by the "Owner".

ARTICLE IV
Terms and Conditions

IV.1 This agreement shall be in effect from JULY 1, 2006 through JULY 1, 2016.

IV.2 This agreement may be extended or terminated upon written consent by both parties at least 15 days prior to construction initiation.

IV.3 The provisions of this agreement may be changed and amended by written agreement by both parties.

IN WITNESS WHEREOF, the parties hereto have executed this agreement on the dates indicated below.

[redacted] July 15, 2006

HCCD Authorized Representative Date

[redacted] 10-6-06

Owner Date

[redacted] July 1, 2006

Lake Poinsett Watershed Coordinator Date

[redacted] 7-10-06

NRCS Authorized Representative Date

SEE ATTACHED AMENDMENT A

Amendment A

The construction of this facility is in response to water quality issues with an existing feedlot located on the same SW1/4 of Section 7-T113N-R55W. To qualify for funding assistance the owner of the existing feedlot agrees to limit its use to incidental use. The existing facilities buildings, working corrals and associated working pens may be used for processing cattle associated with veterinary use or breeding purposes. The existing open feedlot areas shall have established and maintain a **permanent perennial vegetation** in a manner which will remove accumulated soil nutrients. Grazing or haying in the existing feedlot area will be allowed if sufficient residual plant growth is maintained to prevent soil erosion and minimize runoff.

Perennial vegetation on the existing facility shall be established within 2 years of the completion of the new feeding facility.

Failure to comply with Amendment A may result in the refunding of a prorated portion of cost share monies based on a 10 year life-span.

[redacted]

Lake Poinsett Watershed Coordinator Date

[redacted]

Hamlin County Conservation District Rep. Date

[redacted]

Owner Date

Shoreline stabilization agreement.

Letter of Agreement / Understanding
between

Lake Poinsett Watershed Coordinator: RICHARD H. SMITH

Owner: Allen [redacted]

Contractor , Rep.: DAN [redacted]

Hamlin County Conservation District, Rep.: Larry [redacted]

I. 1. The purpose of this project is to prevent further sediment loading of Lake Poinsett from this site. This site has been prioritized based on the amount of material that has the potential of eroding into Lake Poinsett from wind and water wave action.

2. The cost-share funding of this project does not indicate any further responsibility on the part of Lake Poinsett Watershed Project, Hamlin County Conservation District , Consolidated Water Facilities Commission , Environmental Protection Agency or any other State or Federal Agency.

3. The Owner agrees to maintain these improvements for a period of 10 years and maintenance of this site transfers to new owners if property is sold. Owner also agrees to hold harmless to parties involved damage done to landscape, lawns etc. by equipment accessing shore for purpose of construction.

II. 1. Lake Poinsett Watershed Project agrees to cost share this project for an amount of $ 1326 which is approximately 50 % of the total improvements. To be paid directly to contractor upon completion of project and reimbursement from State funds through Hamlin County Conservation District .

2. Owner agrees to pay contractor balance of improvement's cost and any other costs that Owner and Contractor agree to .

3. Contractor agrees to notify LPWPC when construction is to begin and when construction has reached final approval stage but before leaving site. Upon completion and final approval , Contractor will submit bills paid or lien waivers from suppliers for all materials used on project to LPWPC . Performance bonds may be substituted for lien waivers.

[redacted] — Lake Poinsett Watershed Coordinator — Date: 5/12/99

[redacted] — Hamlin County Conservation District, Authorized Representative — Date: 6-1-99

Owner [redacted] — Date: 5/12/99

[redacted] — Contractor , Authorized Representative — Date: 5/12/99

Checklist for shoreline stabilization.

Lake Poinsett Shoreline Stabilization Checklist Prior to Construction

Owner _____

Lake Address _____

Contractor requirements:

_____ 1. Contractor has signed and filed Federal WBE / MBE agreement and nondiscrimination form with Lake Poinsett Watershed Project Coordinator (LPWPC).
_____ 2. Contractor has filed with LPWPC proof of liability insurance along with expiration date of paid up coverage.
_____ 3. Contractor has furnished a bid proposal including quantity or area of coverage of materials, list of suppliers of those materials and total labor for cost-share portion of project to Owner. Dimensions of toe trench , size of rock, slope of fill and thickness of fabric will also be specified.
_____ 4. Contractor has signed Letter of Agreement / Understanding with Owner, LPWPC, and authorized representative of Hamlin County Conservation District.

Owner requirements:

_____ 1. Owner has furnished LPWPC with at least two bid proposals from different contractors of like specifications.
_____ 2. Owner has signed Letter of Agreement / Understanding with Contractor,LPWPC, and authorized representative of Hamlin County Conservation District.

Lake Poinsett Watershed Project Coordinator requirements:

_____ 1. LPWPC has inspected site and has authorized it as priority site to be cost-shared with owner using EPA 319 and Consolidated Water Facilities grant funds for the purpose of sediment control.
_____ 2. LPWPC has signed Letter of Agreement / Understanding with Contractor, Owner, and authorized representative of Hamlin County Conservation District.

Hamlin County Conservation District requirements:

_____ 1. HCCD has signed Letter of Agreement / Understanding with Contractor, LPWPC and Owner.

APPENDIX B

Survey Letters and Returns

Lake Poinsett Watershed Project April 9, 1999
Shoreline Stabilization Activities

This is to inform all Lake Poinsett shoreline owners that the project as of April 1,1999 has secured the authority and funds to proceed with stabilization efforts on the shoreline. The overall goal of the Lake Poinsett Watershed Project is to maintain and improve the quality of water for the public that use and enjoy those waters.This activity falls under the category of Reducing Sediment Load . Therefore the main goal of this activity is to address areas on a cost share basis that have the greatest potential for further erosion and sediment delivery into the lake. The goal of shoreline stabilization is not to improve the value of lake property or to apply emergency efforts to keep structures from being rendered useless or unsafe. However, these are obviously benefits one would enjoy if adequate shoreline protection measures were implemented. Many owners have spent varying amounts ,usually in emergency situations, trying to protect their shoreline. I commend them for their efforts on behalf of all that enjoy the waters of Lake Poinsett. Unfortunately, many of those efforts still are not stable enough in times of high water to adequately maintain protection of shoreline. This means that nearly everyone on the lake is allowed the opportunity to apply for cost share or inquire about improvements they could make to protect the shoreline. Starting an activity like this, that requires a voluntary effort on the part of owners, made total cost estimates for cost share at best a guess. Ideally, we would like to help all those applicants but if more requests are made than we currently have funds for we may have to prioritize. If the activity demonstrates great participation, we will make efforts to secure additional funds. We definitely will be starting work this spring and returning the enclosed application/survey at your earliest convenience will help you and us in determining if a priority system has to be implemented.

The activity was funded and authorized under a proposal that the cost share would be 50% owner and 50% EPA 319 / Consolidated Water Facilities Commission. To limit the amount of grant funds in case of expensive or elaborate design of owners the maximum total cost share dollars provided by EPA 319/CWFC will be $50 per lineal foot of shoreline. Examples:

Contractor bill $70/lineal ft of shore	Owner pays $35	
	Project pays $35	
Contractor bill $120/lineal ft of shore	Owner pays $70	
	Project pays $50	

Procedure for shoreline stabilization cost share

1.Read over thoroughly the sheet on necessary requirements to qualify for cost share.
2.Send in the application form as soon as possible.
3. Contacting contractors for bids will speed up the process to prioritizing.
4. Lake Poinsett Coordinator will approve project sites.
5. Bid contract will be signed by Contractor, Owner and Coordinator and filed in Hamlin County Conservation District office prior to construction.
6. Coordinator will be notified at completion of construction for inspection and approval.
7. Bill for Project's share will be submitted to Coordinator and paid to contractor.
8. Owner is responsible for payment of their share to contractor.

Richard Smith, Lake Poinsett Watershed Project Coordinator

Design Options / Requirements / Explanations of Shoreline Stabilization

Engineering is not always an exact science when dealing with the forces of nature. Lake Poinsett has some very unique characteristics that place it in class by itself compared to other impoundments of water anywhere. First it is large with long expanses which allow waves under normal winds to become larger than on smaller lakes. The larger the waves the more energy they have when contacting the shoreline. Second is the inability of the lake to discharge runoff waters as fast as it receives them, thus encountering flood stage levels, which can reach highs not associated with most lakes. Third is the danger always present when ice heaves on shore or is driven into shore during spring thaw. Fourth are the unstable soil characteristics that make up the banks along the shoreline.

How does one design solutions?

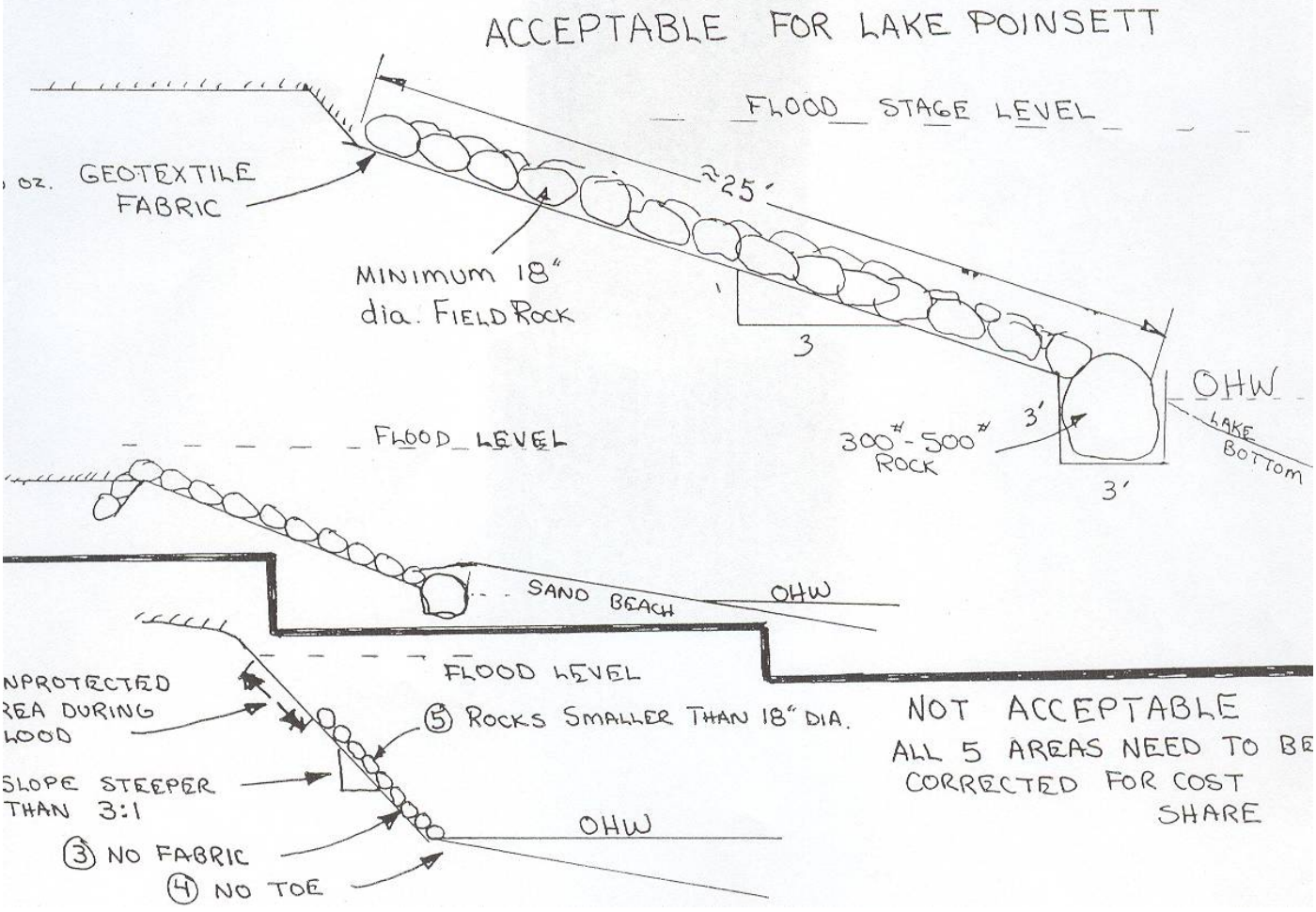
1. To reduce the force from waves the shoreline has to be sloped to allow that energy to be directed upward. The flatter the slope the more area the force is spread over. Example: Drive a car into a vertical wall compared to driving a car into and up a ramp at high speed. The wall may be destroyed but the ramp will be intact. For this reason a 3:1 slope (1-foot rise for every 3-ft horizontal) or flatter is preferred for bank slope.
2. The potential vertical height change means ,that to protect the shoreline from damage and the overtopping of protective structures, the area protected will be up to the previous flood stage levels. On Lake Poinsett this would be approximately 7-9ft. above the ordinary high water mark which on April 9, 1999 is the current lake level. Not to protect to this level will allow the area behind the protected structure to be eroded which will cause the structure to fail. Example: Seawalls that were topped and material was removed from behind allowing walls to tip , crack or fall over.
3. Never will ice damage be fully eliminated ,but the extent can be diminished in many cases if the ice is prevented from making a solid contact with structures. Again the slope of the shoreline is critical just as in wave action but also not allowing the ice to get a firm hold on the structure is key. In a riprap situation that means burying large 300# or larger rock into the beach below the ordinary high water level to begin forcing the ice upward and breaking the sheet into smaller fragments. In seawall situations it means also putting the footing down below the water surface and slanting the wall back. Stories exist about rocks as big as cars being thrust up on the shore but in most all cases these rocks were just setting on the shore or lake bottom not anchored in a trench. For all riprap design a 3ft X 3ft trench will be dug so that the bottom is 2 ft. below the OHW level and filled with 300# or larger rock.
4. Geotextile fabric is necessary in any situation where rock is being placed on the shoreline. By not allowing the underlying fine materials such as clay or sand from being washed out under the rocks the slope will be stable. 8-ounce fabric is to be used on Lake Poinsett due to the weight of rock needed to be placed on it. Fabric will be placed in the trench/ toe and extend to the top of protected area.
5. The size of the rock to be placed on the slope for Lake Poinsett must be 18" diameter or larger and in contact with one another to adequately withstand the wave action . After placing that rock, smaller (8 inch or larger) rock can be used to fill-in gaps and lock larger rock in place. Black dirt is not allowed to be placed over riprap, as the goal is to prevent that type of material from entering the lake.

As coordinator of this project I am open to suggestions and designs that owners and contractors may have in mind. Options may include the use of gabion baskets, field rock versus red quartzite, poured concrete seawalls and driven sheetpiling. In each case we will look at how they will be applied to meet our requirements.

We also have the option with our permit to remove fill material from the lake to restore shorelines as long as we do not place it below the ordinary high water level. It has to be removed by bucket not by a bulldozer .I would like someone to explain the difference to me but that's the way it is. If someone wants to extend their area between top of riprap and buildings and wants cost share we will share the protected slope area but not the additional fill costs behind. If you get a bid from contractor to do this, make sure the cost share portion and the additional fill are on separate bids. Some have large amounts of rock but they are not large enough to meet the requirements for funding. Containing that rock or using only small rock in a wire gabion basket may be a design possibility that I am currently investigating. However you may just want to improve your site without cost share by shaping the slope and placing the largest rock in a trench with fabric. The most expensive portion is hauling in rock and your costs could be considerably less. We will work with you for any designs even if not cost shared if it will help the lake.

Below are a few examples of acceptable and not acceptable designs for cost share.

I look forward to meeting and working with you on this project and hope that the information presented here has better informed you on the practice of stabilizing shorelines to protect water quality.



Lake Poinsett Watershed Project
Shoreline Stabilization Application / Survey

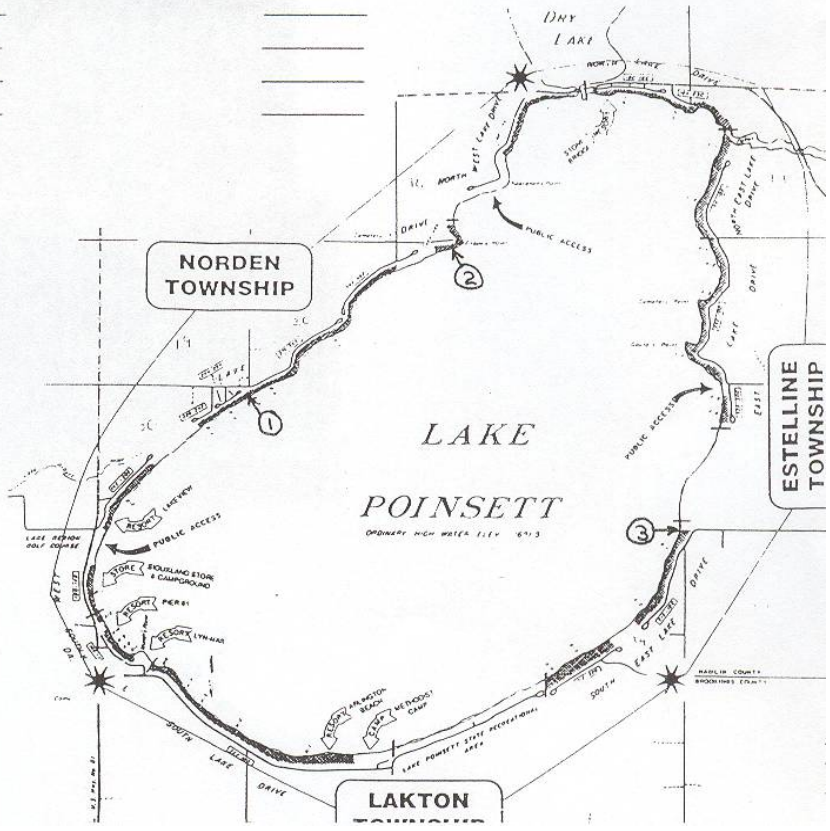
Name of Owner _____
Mailing Address _____
Site address if different _____
Phone numbers : Lake _____ Other home? _____
Business _____ Fax _____
Does this site have a dwelling on it ?_____ Is it used year-around ? _____
How many feet of shoreline do you have?_____
Approximately how high is the bank that could erode above the current water level ?
_____ 5-10 feet _____ 10- 20 feet _____ 20 + feet

If field rock has to be hauled for the entire site and shore access is difficult the cost may approach $90 / ft. with the owner's share being $45 /ft. Red quartzite rock may cost more and concrete work higher also. Having plenty of useable rock would reduce the cost.
Check any that apply
____ I would like to start work now if price is acceptable.
____ I would like to be prioritized now but need time to arrange finances for my share.
I would like to wait till _____(date) to start work.
____ I can't afford the cost but am interested in technical assistance to discuss options when time permits.

Survey only :

Type of structure	I would like	I would not like
Field rock riprap	_____	_____
Red quartzite	_____	_____
Concrete Seawall	_____	_____
Wire gabion basket	_____	_____
Other _____	_____	_____

Circle your site on map.



Demo sites completed
1 2 3

Return to :
Hamlin Co. Conservation Dist.
P.O. Box 165 Hayti,SD 57241

Rejection letter to cost-share applicants.

From: Lake Poinsett Watershed Project June 14,1999
Richard Smith , Coordinator
783-3353
To: Shoreline Stabilization Applicant

This letter is to inform you of the status of Lake Poinsett shoreline stabilization effort. Over 100 applications plus numerous phone call inquiries have been made at this time. The interest generated by this effort pertain to more than 9,000 feet of shoreline on Lake Poinsett. 80 sites requiring evaluation, calculation and prioritization to the potential for further erosion occurring have been completed.

Again let me remind you, past erosion was not a factor in determining cost share prioritization. At this time we will be cost sharing only those sites which have the potential to lose more than 3.5 tons of soil / foot of shoreline. The applications ranged from a potential loss of 0 -- 43.0 tons / foot. The amount of rock on a site had little effect on evaluation if a fabric was not used in conjunction.

Much of this watershed project has to do with educating the public on practices that can be used to save and improve the water quality of Lake Poinsett. Please make use of this office for technical assistance if you are planning any shoreline work, even if not participating in cost share. Past experience has shown that its not the dollars or labor effort used for stabilization but design that determines stability.

This office does not endorse any particular contractor but we do know some that have demonstrated their knowledge, ability and willingness to do it right. We can assist you with options that may fit your particular situation.

_____ your site at
_____ has been evaluated and does not rate high enough for cost share in this phase of project. It's priority rating is _____ of 80 (highest rating is # 1). We will keep your application for cost share on file pending the securing of additional funds or lowering of soil loss requirements.

Producer surveys of workshop contents.

Your Turn- Comments

Please check all that apply. I am a
- [X] Grass Grower / Livestock Harvester
- [ ] Wildlife / Parks Manager
- [ ] NRCS / Extension Educator
- [ ] Water Quality manager
- [ ] Grazing Planner / Consultant
- [ ] Other _____

Rate the following	Excellent	Good	Needs Improvement-please comment
Facilities	✓		
Topics covered	✓		
How material was presented	✓		

Any additional comments on this First Coteau Grazing Conference. PRO or CON

this was great - I learned alot
Good format thats easy to understand
would have liked to have some more localized info on this area

List any additional topics that you feel should be presented in future Grazing Conferences?

any topics on pasture & water improvements
info on (grazing systems) that local people are using
with pros & cons

This Conference was held free of charge with meal included to all attending by our Sponsors. What cost would you as an attendee expect or be willing to pay for a conference like this if no sponsors were involved?
- [ ] Would only attend if free
- [ ] $10 or less
- [X] $ 11 to $25
- [ ] $ 26 to $45

Your Turn- Comments

Please check all that apply. I am a
- ✓ Grass Grower / Livestock Harvester
- ____ Wildlife / Parks Manager
- ____ NRCS / Extension Educator
- ____ Water Quality manager
- ____ Grazing Planner / Consultant
- ✓ Other organic farmer / cow-calf operator

Rate the following	Excellent	Good	Needs Improvement-please comment
Facilities	✓	____	
Topics covered	✓	____	
How material was presented	✓	____	

Any additional comments on this First Coteau Grazing Conference. PRO or CON

Please have another — Info presented was timely and very valuable for me.

List any additional topics that you feel should be presented in future Grazing Conferences?

Soil & Nutrients for pasture fertility to take marginal ground and turn it into great pasture with excellent soil health.

Grassfed finishing — best breeds for achieving this & How

This Conference was held free of charge with meal included to all attending by our Sponsors. What cost would you as an attendee expect or be willing to pay for a conference like this if no sponsors were involved?
- ____ Would only attend if free
- ____ $10 or less
- X $ 11 to $25
- ____ $ 26 to $45

Your Turn- Comments

Please check all that apply. I am a
____ Grass Grower / Livestock Harvester
____ Wildlife / Parks Manager
____ NRCS / Extension Educator
____ Water Quality manager
____ Grazing Planner / Consultant
__X__ Other Farm land owner not an operator.

Rate the following	Excellent	Good	Needs Improvement-please comment
Facilities	X	X	
Topics covered	X	____	
How material was presented	X	____	

Any additional comments on this First Coteau Grazing Conference. PRO or CON

I think we need something similar each year

Just excellent!

List any additional topics that you feel should be presented in future Grazing Conferences?

May be some added emphasis on water & fence facilities.

This Conference was held free of charge with meal included to all attending by our Sponsors. What cost would you as an attendee expect or be willing to pay for a conference like this if no sponsors were involved?

____ Would only attend if free
____ $10 or less
__X__ $ 11 to $25
____ $ 26 to $45

Your Turn- Comments

Please check all that apply. I am a
- [X] Grass Grower / Livestock Harvester
- [ ] Wildlife / Parks Manager
- [ ] NRCS / Extension Educator
- [ ] Water Quality manager
- [ ] Grazing Planner / Consultant
- [ ] Other _____

Rate the following	Excellent	Good	Needs Improvement-please comment
Facilities		X	
Topics covered	X		
How material was presented	X		

Any additional comments on this First Coteau Grazing Conference. PRO or CON

Great Idea I hope you have more

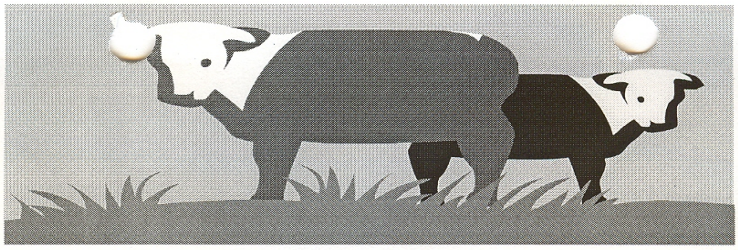
List any additional topics that you feel should be presented in future Grazing Conferences?

Paddock planning

This Conference was held free of charge with meal included to all attending by our Sponsors. What cost would you as an attendee expect or be willing to pay for a conference like this if no sponsors were involved?
- [ ] Would only attend if free
- [ ] $10 or less
- [X] $ 11 to $25
- [ ] $ 26 to $45

APPENDIX C

Tour and Workshop Posters and Invitations

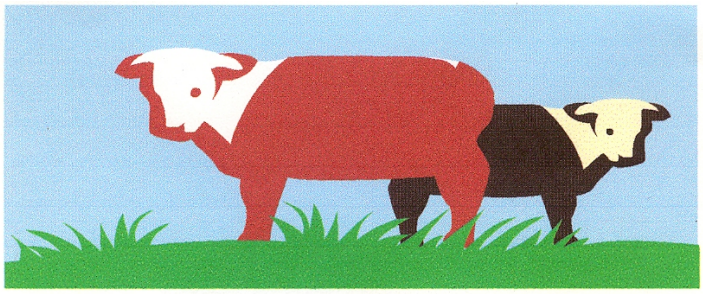


1st Annual Hamlin County Grazing Workshop

1:00 - 1:15	Why Manage Grass?	Rick Smith
1:15 - 1:45	Grass: How it Grows!	John Lentz
1:45 - 2:00	What Defines Healthy Grass?	Rick Smith
2:00 - 2:30	Proper Grazing Management!	Smith/Lentz
2:30 - 3:00	How To Select and Establish Cool and Warm Season Forages!	John Lentz
3:00 - 3:15	Break (Sponsored by Hamlin County Conservation District)	
3:15 – 3:30	Calculating How Much Forage Is Available In Your Pastures!	John Lentz
3:30 - 3:45	Is Fertilizing Pasture Worth It?	Dean Colling
3:45 - 4:00	Weed Control in Pastures!	Dean Colling
4:00 – 4:30	Questions and Answer Session!	

Presenters:
Richard Smith, Lake Poinsett Watershed Project Coordinator
John Lentz, Rangeland Management Specialist (USDA-NRCS)
Dean Colling, Resource Conservationist (Hamlin CD)

Sponsors:
Hamlin County Conservation District, USDA- Natural Resources Conservation Service, Lake Poinsett Watershed Project, Hamlin County Extension Service



Hamlin County Summer Grazing Tour
July 26th

5:00 – 6:00	Burgers, Chips, and Pop	Hamlin Cattlemen and Hamlin Conservation District
6:00 – 7:30	High Tensile Electric Fence Demo	Merle Mohr
7:30 – 8:00	Tour Field of Big Bluestem	Rick Smith
8:00 – 8:30	Learn to Measure Pounds of Forage Available	John Lentz
8:30 - 9:00	Plant Identification in the Field	April Schultz

Presenters:
Merle Mohr, Mohr Fencing
Richard Smith, Lake Poinsett Watershed Project Coordinator
John Lentz, Rangeland Management Specialist (USDA-NRCS)
April Schultz, Agronomist (USDA-NRCS)

Sponsors:
Hamlin County Conservation District, USDA- Natural Resources Conservation Service, Lake Poinsett Watershed Project, Hamlin County Cattlemen's Association, Sioux Nation Supply

Tour will begin at Oxford township hall (located 7 miles north of Hayti) Please R.S.V.P. by July 23rd if you plan on attending (605) 783-3353.

Hamlin County Summer Grazing Tour July 21st

On July 21st we will hold our annual summer grazing tour. If you want to reserve a seat on the bus please call ahead (605) 783-3642 Ext. 3. the first 40 people to call can ride for free. The bus leaves at 4:30 from the 4-H Grounds In Hayti.

Things To See and Learn About On The Tour!!!

- Fertility Study "Does Pasture Fertilization Pay?"
- "Need Water Fast?, Want Better Animal Performance?, Dugout Dry?" Above ground pasture pipe may be the answer!
- Alternative Forages "Turnips, Rye, Vetch"
- Tour "Cattle Still Cabin Company's" eight pasture rotational grazing system. Selected by the Society of Range Management as the 2004 Area I Grazing Award Winner.

Special Guest: Dr. Alexander "Sandy" Smart – SDSU Range Professor

FREE SUPPER SPONSORED BY HAMLIN COUNTY CONSERVATION DISTRICT AND HAMLIN COUNTY LIVESTOCK IMPROVEMENT ASSOCIATION AFTER THE TOUR

Sponsorsed By: Hamlin County Conservation District, Natural Resources Conservation Service, South Dakota Cooperative Extension Service, Lake Poinsett Watershed Project, and Hamlin County Livestock Improvement Association.

Holistic Management Workshop

"Life is a Whole Experience"

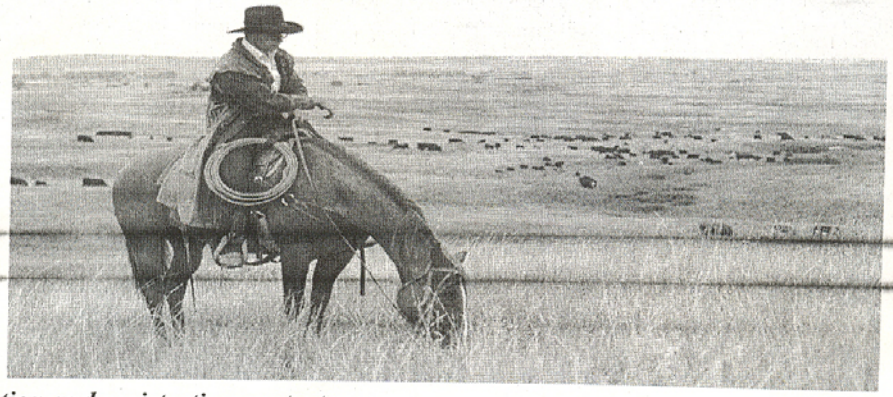
Begin the process of establishing your roadmap to personal and professional success using the Holistic Management Model.

February 17th & 18th – Mitchell, SD
Davison County 4-H Fairgrounds

February 19th & 20th – Watertown, SD
Codington County Extension Center

February 27th & 28th – Kadoka, SD
Club 27, 107 East Highway 16

Workshop hours are 10 am to 5 pm day one and 8:30 am to 3 pm day two. No cost to attend. Registration Deadline is February 13th for the Mitchell and Watertown workshops and February 20th for the Kadoka workshop. Participation is limited to 100 at each workshop.



For information and registration contact -
Mitchell Workshop - Lower James RC&D at (605) 996-1031
Watertown Workshop – Hamlin County Conservation District at (605) 783-3353
Kadoka Workshop – Badlands RC&D at (605) 685-6629 or South Central RC&D at (605) 259-3547

These workshops are sponsored in part by the South Dakota Grassland Coalition, Davison County Extension, Natural Resources Conservation Service, Lower James, Badlands, and South Central RC&D, and the Hamlin County Conservation District

Thursday November 9th 2000 1:30 PM
Tour A New Animal Waste System

You are invited to tour David Anderson's recently completed system. This system was funded through the Lake Poinsett Watershed Project in cooperation with David. The system consists of clean water diversion dikes, a trash collection basin, evaporation pond and required fencing. Personnel will be on hand to explain how the system works and answer any questions you might have about how a system could be designed for your operation. Funding options for all producers whether in the watershed boundary or out can be explained.

If you are a member of the Hamlin Cattlemen beef/dairy organization or want to learn more about the organization a short meeting (20 min.) will be held on site at 2:00PM. Find out how SDCA is working to address feedlot concerns. Directors will be discussing the upcoming SDCA convention in Huron on November 29&30. This is your organization and your voice in South Dakota beef issues. Hamlin Cattlemen should have representatives at several of the committee meetings as their resolutions drive this organization. With Huron being as close as it is, we should be able to car pool down for one or both days. Read your recently mailed SDCA magazine to familarize yourself with the schedule and speakers.

Coffee and cookies will be provided by Lake Poinsett Watershed Project.

Take a few minutes, call a friend and join us.

Rick Smith
Poinsett Project Coordinator
Sec. Hamlin Cattlemen

John Lentz
Hamlin Co. NRCS
District Conservationist

Dorene Lemme
Hamlin Co. Conservation
District Manager

Lake Poinsett Watershed Project
Box 165
Hayti, South Dakota 57241
605-783-3353

January 2002

Special Invite to Watershed Residents:

As part of the ongoing activities of the Lake Poinsett Watershed Project this workshop is being held to inform local farmers of the benefits derived from understanding soil quality factors and cropping rotations. The underlying reason for the Project to be involved is that the soil factors and cropping systems that benefit crop production the most are the same factors that control runoff.

Because you own or farm land located in or near the watershed's priority area we would especially appreciate the opportunity to share this information with you. Although this workshop is open to the general public, this watershed has the most to gain from your attendance. As with previous workshops we have presented, we are not promoting products or costly inputs. Our desire is to provide you with information you can use to better your farming operation.

For those that attended our grazing workshop and grazing tour last year we will again be holding a workshop (tentatively in late February) for 2002. If you have any special topics you would like covered for the grazing workshop , let us know.

If you have any questions about this workshop or other activities we are conducting in the watershed give me a call.

Hope to see you at the workshop,

Richard Smith, Lake Poinsett Watershed Coordinator

SOIL SURVEY WORKSHOP

August 14th at Hamlin 4-H Building in Hayti from 10:00 - 2:00

NEW FARM BILL PROGRAMS

FREE MEAL AT 12:00

GUEST SPEAKERS

FREE SOIL SURVEY BOOK TO ANYONE WHO ATTENDS

The new Hamlin County Soil Survey books have arrived, this is a great opportunity to hear how the books were developed and learn how to use the information within the survey to increase profitability of your farm. We will only hold this workshop once so please don't miss this great opportunity!

Please RSVP By August 6th if you plan to attend 783-3611

APPENDIX D

Coordinator Articles in Association Newsletters

ORGANIZATIONAL NEWS

LAKE POINSETT SANITARY DISTRICT

We have ongoing contact with Senator Tom Daschle's office concerning funding to complete the sewer system around the lake. The current engineering study indicates the cost of the total project to nearly $5,000,000.00. It is our intention to obtain up to $3,500,000.00 from other than local funds. The remaining funds would come from a loan, hook up fees and a reasonable monthly sewer rate. We all need to recall that the goal is to improve and maintain the quality of water in Lake Poinsett for future generations and ours.

This spring it will be necessary to do significant repair on the Pier 81 and Stone Bridge Lagoons. The work will be completed by Nitteberg's Construction at a cost of up to $35,000.00. We intend to refinance the current loan to complete this necessary project.

The garbage service remains the same as in past years. The yellow bags are available at Siouxland and Arlington Beach. The pickup is on Mondays unless that is a holiday, the pickup then will be on Tuesday. The pickup time is after 7:00 a.m.

The Sanitary District Board meets at 7:00 p.m. on the second Tuesday of each month at Siouxland. If it becomes necessary to change the meeting schedule, a notice will be posted at Siouxland. Patrons are invited to attend and participate in the discussion.

LAKE POINSETT WATERSHED PROJECT

by Rick Smith, Coordinator

A full summer of additional shoreline work is scheduled. All work agreed to at this time is fully funded. On April 13, 2000, I will be presenting requests to State Water Board in Pierre for additional funds to be used for shoreline construction work. All indications are that we will receive all or majority of $80,000 request. Our 1999 accomplishments on the lake have not gone unnoticed and have generated considerable inquires as to how this project is being run to reach the acceptance level it has.

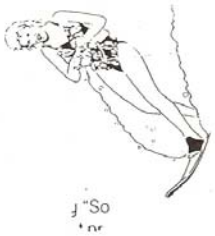
If the water level continues to decline on Poinsett, it would be an excellent time to reclaim rock material that has worked away from shore. If lake residents are thinking about getting a contractor to move rocks on their own, PLEASE let me know. I will work with anyone that will listen on how to protect shorelines the right way. I have slides to show what happens when corners are cut or just not done properly. I fear some outside contractors might slip in and do unacceptable work at an unacceptable price. Nearly all property could use at least some minor work with materials on hand. Even though some property has such a minor effect on the lake itself and doesn't warrant cost share. I would like to see that what is done be effective for the homeowner and not just cosmetic until high water returns. If you hear or see your neighbor start some shoreline work, ask them if they've checked with me for assistance. Let's not waste money!

Grassed waterways are very effective in decreasing sediment carried in flowing water. Interest is growing with farmers and we have 8000 feet nearly ready for construction. Completion, as always, is dependent on weather and contractors.

After analyzing all the best management practices that farmers or landowners can use for various crops or enterprises, I have come to one conclusion. The very best thing that could happen to the Lake Poinsett watershed is more acres of GRASS. Not just CRP but more acres of pasture, better management of current pasture and 50-100 foot buffer areas along every tributary or waterway in the watershed. Just for information the amount of runoff is three to four times higher on a corn or soybean field compared to a 6-inch tall stand of grass on the same land. No other land management technique has that much effect.

LPADA NEWSLETTER

Dedicated to the improvement and preservation of Lake Poinsett



April 2000 — Vol. 36, No. 1

A Note From LPADA President Jim Thoreson

As you may already know, there's becoming a lot more

MEMBERSHIPS: We are no accepting membership dues for 2000. The dues remain at $25. Your membership dues entitles you to a new free directory which should be ready at the annual meeting on June 3 at Lake Poinsett Camp. The newsletters for April and May are mailed to all property owners, but only to paid up members for the balance of June, July, August and September. Let's all support the Lake Poinsett Area Da-

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Lake Poinsett Watershed Project

Richard Smith, Project Coordinator

Some call this the Information Age and indeed for anyone wanting information the world is available through the Internet. However, for someone to gain information two elements are necessary. First the person must want to learn and second they need to know what they are looking for. On the other hand, sources with information have to find ways to make it available to individuals. Being a watershed coordinator, I find myself learning information on alternative agriculture, improved grass and livestock production, engineering design options, farming and livestock practices with their effect on water quality and governmental programs/policies. Finding ways to convey this information to individuals not looking for it is my main task. If you have read to this point you have probably already demonstrated more interest in learning than most that received the newsletter.

Since you've read to here let me list a few items I think farmers should show an interest in. The word 'watershed' is rapidly becoming the driving force that governmental policies and programs will be distinguished by. Watershed management concentrates on the entire drainage area that empties into a designated water body, which typically will be a lake or portion of stream. This concept focuses attention on cause and effect in measurable terms. Farming practices that allow elevated amounts of sediment or nutrients to flow off fields in runoff will, if unchecked, end up in waterbodies downstream. When bacteria from animals end up in public water sources used for drinking, food processing, food production or recreation, the water quality is reduced and there is additional cost for users to clean or find new sources of water if possible.

The term non-point source means the effect on water quality cannot be traced to a particular site. This does not mean that the kinds of sources responsible are not known. Hills with small erosion channels down chisel grooves or planter furrows, waterways with deep cuts, shorelines and creeks with vertical banks are responsible for sediment. Water flowing through feedlots, manure applied to frozen ground or in waterways, pastures grazed closer than 2 inches, cattle standing in water fighting flies or cooling off are responsible for fecal bacteria and nutrients. Over application of nitrogen, farming practices that increase surface water runoff from land and leaching into tiles or shallow aquifers all contribute to elevated nutrient levels in downstream waters. If you have any of the above situations, would like a no obligation evaluation or more specifics on cost share opportunities, give me a call at 783-3353.

1999 Watershed Projects Completed

Projects	Amount	Owner	LPW
Lake Poinsett Shoreline	4711 ft	$144,000	$116,000
Animal Waste Control	1	19,174	50,000
Dams/Ponds	4	3,021	9,066
Grassed Waterways	4000 ft	1,310	3,931
Pasture Improvements	2	808	2,424

Landowner Contributions = $168,313

Poinsett Watershed Project Cost Share = $181,421

Goal for 2000 Total Improvements ---$348,500

Shoreline Stabilization on Lake Poinsett

By Richard Smith, Lake Poinsett Watershed Project Coordinator

After several years of severe shoreline erosion due to flood level water conditions and inadequate stabilization methods, Lake Poinsett and its property owners were in need of help. Not only was the lake being filled from upstream sediment, but also shoreline erosion due to wave action was compounding the problem. Lake homeowners had access to little technical help and the problem was inadequately addressed in the original Lake Poinsett Watershed Project (LPWP) plan.

The original plan called for a "few" demo sites to be constructed for the shoreowners to observe. As coordinator, I questioned why we had funds to prevent sediment from fields several miles from the lake entering the lake but nothing to prevent tons of shoreline material from the entering the lake. If we were going to attack water quality in Lake Poinsett, we had to at least find some way to promote broad based shoreline stabilization. In January 1999 a proposal was drawn to use additional EPA 319 and other state funds to be cost-shared 50/50 with local landowners.

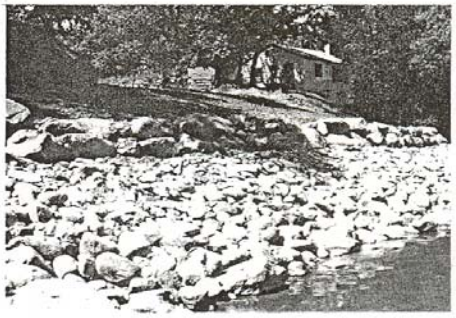
The proposal was for protection and stabilization costs only and other landscaping cost would solely the landowners' responsibilities. All 600+ owners were notified of the opportunity to have their property evaluated for a cost share program. Owners were advised that this was not a FEMA type program to rebuild personal property but was a water quality project to prevent further erosion into the lake.

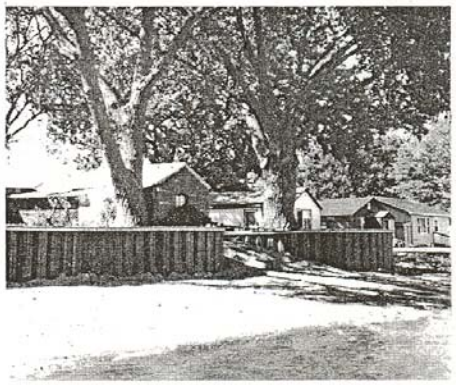
Like many South Dakota lakes, the terrain surrounding Lake Poinsett varies from flat sand beaches to vertical clay cliffs. Obviously, those areas of high unprotected banks proposed a much greater potential for erosion than the relatively low long sloping sandy shores. A formula was developed to evaluate the potential amount of material still at risk of eroding into Lake Poinsett. Cost share was offered to those sites with a potential to lose in excess of 3.5 tons per foot of shoreline.

As we began construction, the only guide we had was previous riprap projects. Working with local farmers and contractors, we were able to secure a good starting source of field stones which, when sorted, would meet the standards for stability. In many cases, as excavators dug into the off shore wa-

(Continued on page 6)

Above: Shoreline along Lake Poinsett before stabilization.
Below: Same stretch of shoreline after being stabilized by riprap.





Property owners along Lake Poinsett could select rock or steel sheeting (pictured above) to prevent erosion.

JAN 05 2000

SDLSA BULLETIN

The official publication of the South Dakota Lakes And Streams Association Winter 1999

Preserve, protect, restore through stewardship, education and networking

(Lake Poinsett Continued from page 5)

ters to reclaim eroded material, rocks were found. In some instances, no additional rock needed to be hauled in.

The riprap process was very successful until we started to encounter the more vertical shores. In addition to the steeper shores, access was beginning to be a problem as many lots were to too narrow to bring in truckloads of rock. We were also meeting with some resistance from owners who had sandy beaches and did not want to cover them with rock. These problems precipitated our experimentation with steel sheet piling to control erosion.

Falling steel prices had made sheet piling cost competitive with rock. The sheet piling also offered flexibility in that the wall could be built as close to or far from the water as the land owner wanted. Any backfill that was needed would be silt taken from the lake, most of which was previously eroded bank. The steel was an instant hit and the use of rock virtually stopped.

As winter approaches, we will have completed over 4000 feet of protection on some of the most critical areas of Lake Poinsett. The stabilization of shoreline has spurred other development as homeowners gain confidence that their investment in lake property will not be lost to future erosion.

The areas still in need of protection are typically undeveloped and owned or inherited bypeopel that live in distant states and have not visited their property for a long time. Our challenge is to persuade them to tak on the same conscientious effort to protect the water quality of Lake Poinsett as those who live by the lake already have.

Conservation Comments

Hamlin County Conservation District
PO Box 165, Hayti, SD 57241
Summer 2003
(605) 783-3353

Lake Poinsett Watershed Project
By Rick Smith, Coordinator

One of the goals for a watershed project is to gather together and coordinate the actions of agencies, organizations and individuals interested in water quality issues. Sometimes these and other entities have never considered the impact of their actions on water quality. You may have noticed the presence of the Lake Poinsett Watershed Project at many of the county zoning meetings. By being available to offer input on proposed construction activities and developments, many future problems can be eliminated. Much of my time is now spent helping direct developers or homeowners on projects for their property that will minimize the effect on water quality. The involvement of the Project with developments assures that all the agencies, rules and regulations are being followed. Occasionally we have individuals that do not involve us and as a result find themselves with problems that cost both time and money to correct.

Livestock operations continue to get a lot of focus from the Project in two areas. First are the confined animal feeding operations and the distribution of manure from these concentrated areas. Nutrient management does not have to be a problem for livestock owners if common sense and responsible use of nutrients is practiced. Barring problems with runoff into water the most common complaints come from neighbors. Respecting neighbors by paying attention to wind direction, temperatures and application method is necessary to prevent more stringent requirements to your operation. Even if you have a small established feeding site , I would recommend you have a nutrient management plan developed for yourself. We are in the process of creating a map of Hamlin County that delineates all of the acres that have a nutrient management plan in place including the new manure easements for operations that do not have enough owned or rented land for the manure being produced. This map will be an asset to individuals proposing to pick areas for new dairy or livestock operations.

Our second focus for livestock is improving and adding additional acres of productive grassland to our watershed. Our well attended workshops and tours have resulted in huge changes in livestock management. Examples now include, prime high quality grazing for July and August by planting warm season natives, above ground pipelines providing clean non toxic water, and even dairy cows enjoying the freedom of natural grazing during lactation while maintaining production. If you are interested in optimizing the production from your pastures and livestock, give us a call. We have many options available for those interested in improving their management skills. Due to documented suppressed cattle gains from dugouts which allow cattle to access them, we are discouraging cleaning out and use of dugouts if a clean water source is available.

APPENDIX E

Newspaper Articles and Brochures

Interested conservationists attend first grazing tour

HAYTI — Livestock producers and interested conservationist participated in the first of what sponsors hope becomes an annual grazing tour event. Fifty-two individuals registered for the evening meal held at the Oxford Township Hall and tour on the Rick Smith farm.

Merle Mohr from Gallagher fencing held the audience's undivided attention during his demonstration on erecting high tensile fence for cross-fencing to be used in conjunction with rotational grazing. Many producers had their first opportunity to view a field of "Sunnyview" Big Bluestem, a native warm season grass.

Smith gave a history of several of the native warm season graas fields he has growing and explained the proces to follow for establishing warm season grass. John Lentz, Hamlin District Conservationist with Natural Resource Conservation Service (NRCS), used the Big Bluestem to demonstrate how measurements of forage available for grazing is derived. Producers were impressed that one acre of the existing forage could provide the equivalent of 142 days of grazing for one cow-calf pair while only removing 50 percent of the plant as is recommended for rotational grazing.

Tour a success

The first grazing tour was attended by 52 livestock producers interested in learning about conservation in their operations.

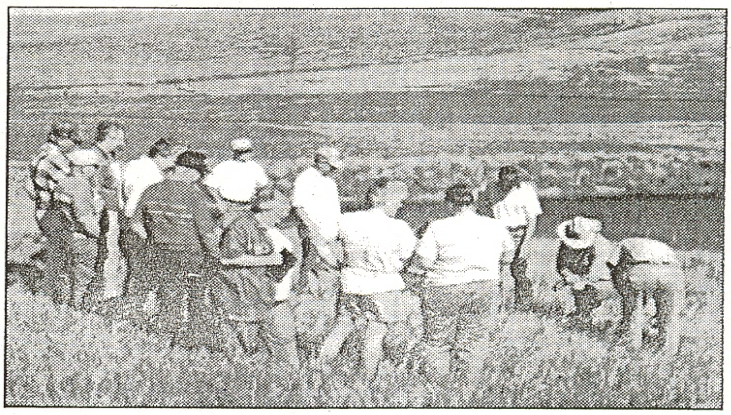
Lentz pointed out the benefit of having a portion of forage acres in warm season grasses to compliment cool season grass pastures. The combination will provide a supply of highly nutritious forage for livestock gains throughout the grazing season. Concluding the tour was a walk on a virgin native pasture that contained over 50 different grass, forb and small woody shrub native species.

April Schultz, NRCS-USDA agronomist, had flagged and identified 28 of the more numerous species and explained how each fit into the native ecosystem.

Sponsors of the meal included Hamlin County Conservation, Jeff Tubandt-Sioux Nation Vet Supply, Burton Tesch and Lake Poinsett Watershed Project.

Learning about range plants

An afternoon of learning about native range plants in virgin pastures was held for 4-Hers on the Rick Smith farm. Don Guthmiller, Extension Educator, explained the requirements to complete a 4-H lot exhibit. April Schultz, NRCS-USDA agronomist, and John Lentz, range management specialist, gave instructions on how to identify species by observing specific plant parts and how to collect and preserve plants for exhibit. During the short pasture walk they identified 28 different species, which was about half o the species present at the site. The 4-Hers learned about the benefits that diversity of plant species have on animals, birds and insects. They also learned how Native Americans had used the plants for medicinal treatments, food or fiber.



Task Force tour

Members of the South Dakota Non-Point Source Task Force recently had the opportunity to tour projects that had been completed as the result of the Lake Poinsett Watershed Project. They were joined by local owners, producers and conservation district personnel that explained water quality projects within the watershed. The tour included stops at Kevin and Joan Stormo (rotational grazing), Walter Ree (grassed waterways and dam), David Anderson (animal waste system), Morrel Spencer (native grass CRP), and several shoreline stabilization sites concluding with the Methodist Camp. The Task Force is responsible for appropriating state and federal grant monies to address water quality issues within South Dakota. For more information about cost-share activities within the Lake Poinsett Watershed contact Rick Smith, project coordinator, 783-3353.

Producers see new animal waste system

About a dozen area cattle producers toured David Anderson's farm to see the recently completed animal waste system.

The new system was funded through the Lake Poinsett Watershed Project in cooperation with Anderson.

The system consists of clean water diversion dikes, a trash collection basin, evaporation pond and required fencing.

After the tour Rick Smith, Poinsett Project Coordinator, went over the advantages of putting in a new waste system such as Anderson's. The lots will become drier, a producer would be looking ahead and seeing the benefits, the producer will be able to harvest more nutrients from the lot to use for fertilizer and the producer would be taking a proactive stand looking into the future instead of taking a reactive stand waiting until they are told to do it.

Smith went over several steps to complete an animal waste system.

1. Producer needs to initiate contact with local NRCS or Watershed Project coordinator. Located in the local Conservation District office.

2. Arrange on site visit. Begin nurtient management plan. Fill out animal waste management facility priority evaluation worksheet. Requires location of water supplies and inventories kind and number of livestock.

3. USGS topographic map-determines watershed size, impacted waters and if Corps of Engineers permit needed.

4. Soil survey and test hole borings to determine suitability and shallow aquifer status.

5. Wetland evaluation to determine if HGM wetland impact is involved.

6. Application turned over to Ag Waste Team for prioritizing and scheduled design survey if accepted.

7. Seek funding for cost-share based on estimated costs.

8. Producer required to obtain three written bids prior to selecting contractor.

9. Producer gives final consent to build.

10. Construction.

11. Complete nutrient management plans and follow guidelines to comply with rules of cost-share.

The purpose of this process includes, evaluate if public or producer would benefit, evaluate if possible to build with affecting other public or private concerns, approved and tested design, evaluate the costs and benefits of actual project, arrange payment process, get the best deal and/or timing on construction cost and manage use of nutrients for benefit of producer and public.

According to Smith, this system will benefit both Anderson and Dry Lake.

Participation with Lake Poinsett Watershed is voluntary not mandatory. Any producer found to be in violation of South Dakota State Water Laws in regards to polluting of State waters is subject to fines and other penalties. Any producer placed on Notice of Violation is ineligible to receive cost share assistance from Watershed Funds.

photo by Larry Leeds

Explaining the benefits

Rick Smith, Lake Poinsett Project Coordinator, tells area producers about the benefits of animal waste systems and the steps in completing one.

Public Opinion Photo by Terry O'Keefe

Area residents attending the 2005 Watertown Winter Farm Show this week have an opportunity to have their well water tested for nitrate levels. Jay Gilbertson, right, from the East Dakota Water Development District, and Rick Smith, Lake Poinsett Watershed Project Coordinator, were at the show Wednesday testing samples people brought in. Cliff Aker, left, of Watertown, had a sample tested from a well on some rural property he owns. The water testing only takes a couple of minutes and will also be offered at the Farm Show again on Saturday from 10 a.m. to 5 p.m. at the Soil and Water Conservation Districts booth in the Extension Complex.

2/9/05

Streambank Stabilization

A number of methods to prevent streambanks from collapsing into the waterway are being tried. These include tree planting, root wads, and hard practices using rip rap methods. This is a relatively new science to this area, and we are looking for demonstration sites to implement these programs on a trial basis.

Most problem areas are in grazing lands along feeder streams and the lakeshore. Fencing streambanks will keep livestock from damaging the practice; the project can provide alternate water supplies if necessary.

Cost share for these riparian demonstration projects will be 75 to 100% depending on land-owner involvement.

Wetland Restoration

Draining and farming wetlands has reduced the water storage capacity of the watershed. A cooperative effort to seasonally restore wetlands is offered by the project.

A program of restoring wetlands to seasonal use is offered by wildlife agencies. Drainage ditches are plugged using a control device that will allow for drainage after waterfowl nesting is completed. The area then may be grazed or cut for hay. Ideal areas are broad shallow ponding topography, with upland grasses nearby, and a permanent waterbody within two miles.

The control devices are 75% cost shared, and a one time per acre fee is paid to the operator for setting the land aside. Set aside fees vary with land use values and location. There is a ten year contract with this practice.

Ag Waste Management Systems

Feedlots have the potential to deliver large amounts of nitrates and phosphates to our waterways during spring melt and large rain events. As manure decays, bacteria convert usable nitrogen to nitrate, which is easily lost to water. Phosphates attached to soil particles and organic matter enter the waterways when these particles are dislodges and become mobile. Manure must be managed both when applied and when stored. Properly managed manure is an economical fertilizer source.

Ag waste management systems can be as simple as an application plan. It may include diverting clean water from the feedlot area. It may be a full system storing both solid and liquid manure. It may be all of these plans.

Our technicians can advise which type of management is best for you, and how to maximize your profits with a well planned management system. This service is available at no cost.

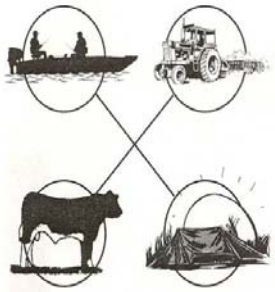
Cost share for construction activities is available up to 90% of the practice. Producers will follow the operations and maintenance plan set by the Natural Resources Conservation Service to ensure the success of the system.

LAKE POINSETT WATERSHED PROJECT

P.O. Box 165
Hayti, South Dakota 57241
(605) 783-3353
Fax (605) 783-3412

LAKE POINSETT WATERSHED PROJECT

Working Together For The Watershed



Our Goal:
"Restore Lake Poinsett Watershed to ensure the long term full realization of all designated uses of our lakes."

We will accomplish this by:
Reducing the amount of sediment and nutrients going directly into Lake Poinsett as well as the lakes and streams throughout the watershed.

Lake Poinsett Watershed Project Working Together for the Future

Rural and Lake neighbors in the 280,000 plus acres of watershed are working together for an acceptable solution to water quality protection and farm/ranch profitability. The 1996 Diagnostic Feasibility Study identified nutrient loading and soil loss as major threats to our lakes and waterways.

After meeting with farm and ranch producers, local, federal, and state government agencies, wildlife organizations, and lake residents, cost share programs were established to meet our goals of improved water quality in the Lake Poinsett watershed.

It is our promise to be as flexible as possible with the cost share programs, but we need to work within guidelines established by the granting agencies. We will provide all technical assistance possible in the implementation of these practices.

Shoreline Fertilization and Stabilization

This is an informational program to advise lakeshore owners of proper fertilizer use. Overfertilization, use of fertilizer with phosphorous, fertilizing before rains, can all result in a direct flow of nutrients into the lake.

There is also a voluntary shoreline stablization program. This will result in a reduction of sediment loading due to the erosion of unprotected shoreline. Both "hard" and "soft" methods of stabilization will be demonstrated for lakeshore owners on public controlled areas.

Grazing Management

Planned grazing systems demonstrate that proper grazing can lead to improved plant vigor, resulting in bigger profits, increased infiltration, reduced water flows, and reduced sediment and nutrient loss to waterways.

Cost shares will be awarded up to 75% of the establishment expenses. Included are: interior cross fencing, native grass seeding, and establishing alternate water sources.

Individual plans will be developed cooperatively by the producer and project technicians. The plan will be based on producer goals, land/grass inventory, and water sources. Technicians will work on a yearly basis for three years to assist in the most beneficial rotation plan for the producer.

Filterstrip Seeding

The goal is to reduce sediment delivery to streams and rivers. The filter strip will act as a buffer to contain soil loss between crop land and the waterway. The grasses will also utilize run off nutrients before they can reach the waterway.

The producer and land use technicians will determine the best seed mixtures for the area.

The watershed project will cost share up to 80% for seedbed preparation, seed and the seeding operation. The width of filterstrips will be determined by erosion severity and potential nutrient loss into the waterway. Producers will be encouraged to integrate other conservation practices in the adjacent cropland.

Small Ponds or Dams

These dams will be designed to slow water movement and reduce sediment loading from excessive runoff or spring melt. They may also be used for livestock water and wildlife.

Location sites require a topography compatible with small dam design. Most structures will be in the steeper sloped uplands with small watersheds. Producers will be encouraged to use these structures to complement grazing management or other soil loss practices.

Producers will receive a 50-80% cost share, and will be asked to follow an approved 10 year maintenance agreement.

Grassed Waterways

This practice will be applied to sites where gully erosion is evident and recurring. Producers will be encouraged to integrate other conservation measures with the waterway, to increase the effectiveness and lifespan of the practice.

Technical assistance will be provided to producers with minor erosion to allow for minimal cost corrections without construction work.

Those areas where severe erosion exists, a waterway design, shaping, and seeding will be cost shared up to 75%. Producers will be asked to do yearly maintenance to increase the effectiveness and lifespan of the waterway.

Crop Residue Management

This practice is directed towards producers not currently practicing no till farming. It will give the producer the opportunity to learn the benefits of conservation tillage.

This practice targets fields with slopes that tend to have visible sheet and fully erosion. Producers will be asked to retain 50% ground cover after planting into small grain or corn, and 30% after planting into soybeans. Producers will plant directly into crop residue.

The Hamlin Conservation District has a drill available for operators to rent.