Section 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

Stutsman County Manure Management Program Phase II

By

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This project was conducted in cooperation with the State of North Dakota and the United Stated Environmental Protection Agency Region 8.

Grant #: 00863317

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EXECUTIVE SUMMARY

PROJECT TITLE:	Stutsman County Manure Management Program Phase II	
PROJECT START DATE:	July 1, 2017	
PROJECT COPLETION DATE:	December 31, 2022	
FUNDING:	TOTAL ORIGINAL BUDGET	$1,044,875
	TOTAL ORIGINAL 319 GRANT	$626,925
	TOTAL EXPENDITURES OF 319 FUNDS	$619,105
	TOTAL SECTION 319 MATCH ACCRUED	$412,737
	TOTAL EXPENDITURES	$1,031,842

SUMMARY ACCOMPLISHMENTS

From 2017 to 2022 the Stutsman County SCD conducted a Section 319 Implementation Project aimed at reducing NPS pollution from Animal Feeding Operation (AFO) into Stutsman County lakes and streams. Implementation of the Phase II project was successful at updating animal feeding operations throughout Stutsman County. By the end of the project period in December 2022, 1 producer had updated their facilities with full containment systems and 25 producers had established partial manure management systems to reduce or eliminate concentrated manure runoff.

Educational efforts have strived to reach most livestock producers in Stutsman County. This includes 15 newsletters and six workshops/tours. The focus is on reducing animal waste concentration during the winter months by grazing cropland residue acres. Another focus is looking at cropland field and reducing erosion. These events have taken place throughout the year, February's workshops have focused on operations that have installed feedlot updates or partial manure management systems.

1.0 Introduction

Stutsman County is located in southeastern North Dakota and contains watershed areas of three main basins: the James River, the Sheyenne River, and the Apple Creek/Long Lake. The project area focused on water bodies currently not included in a current watershed project area.

Stutsman County has an area of approximately 2,298 square miles or approximately 1,470,720 acres. The area currently included in this project request is approximately 1,168,838 acres the focus was on management of AFOs within the watersheds for the priority lakes.

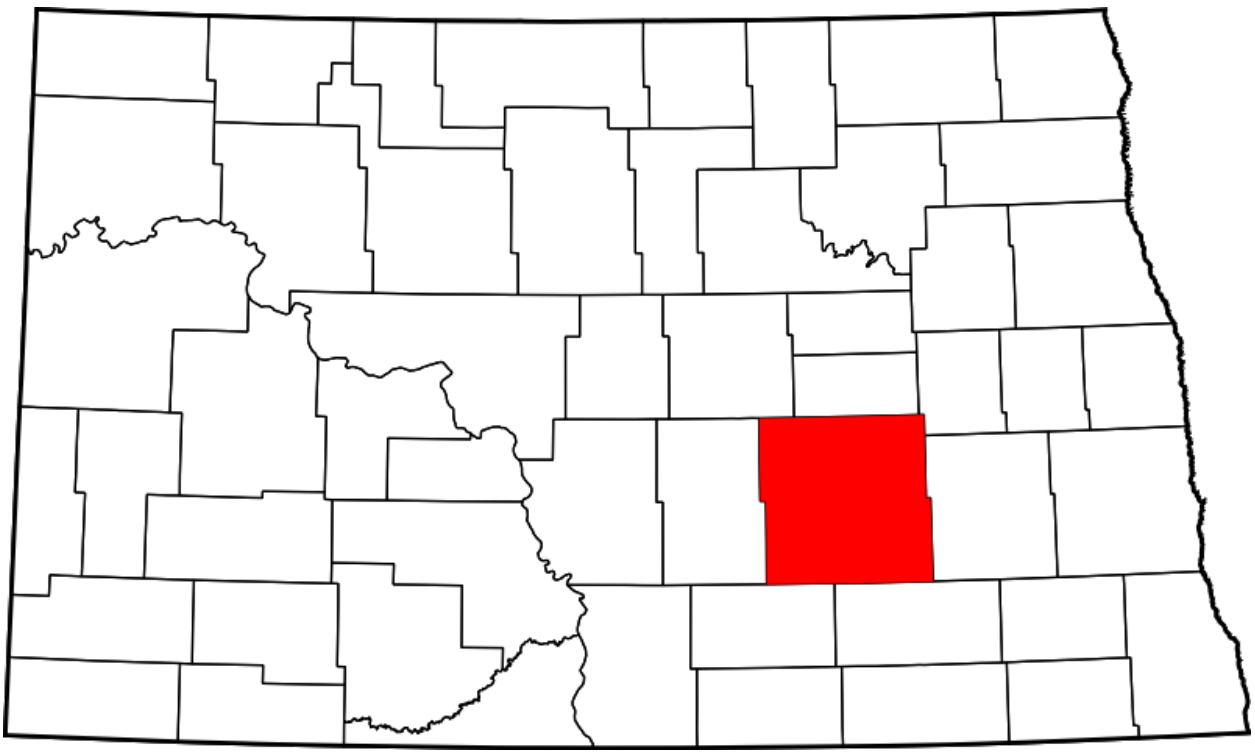


Figure 1 Stutsman County Area Map

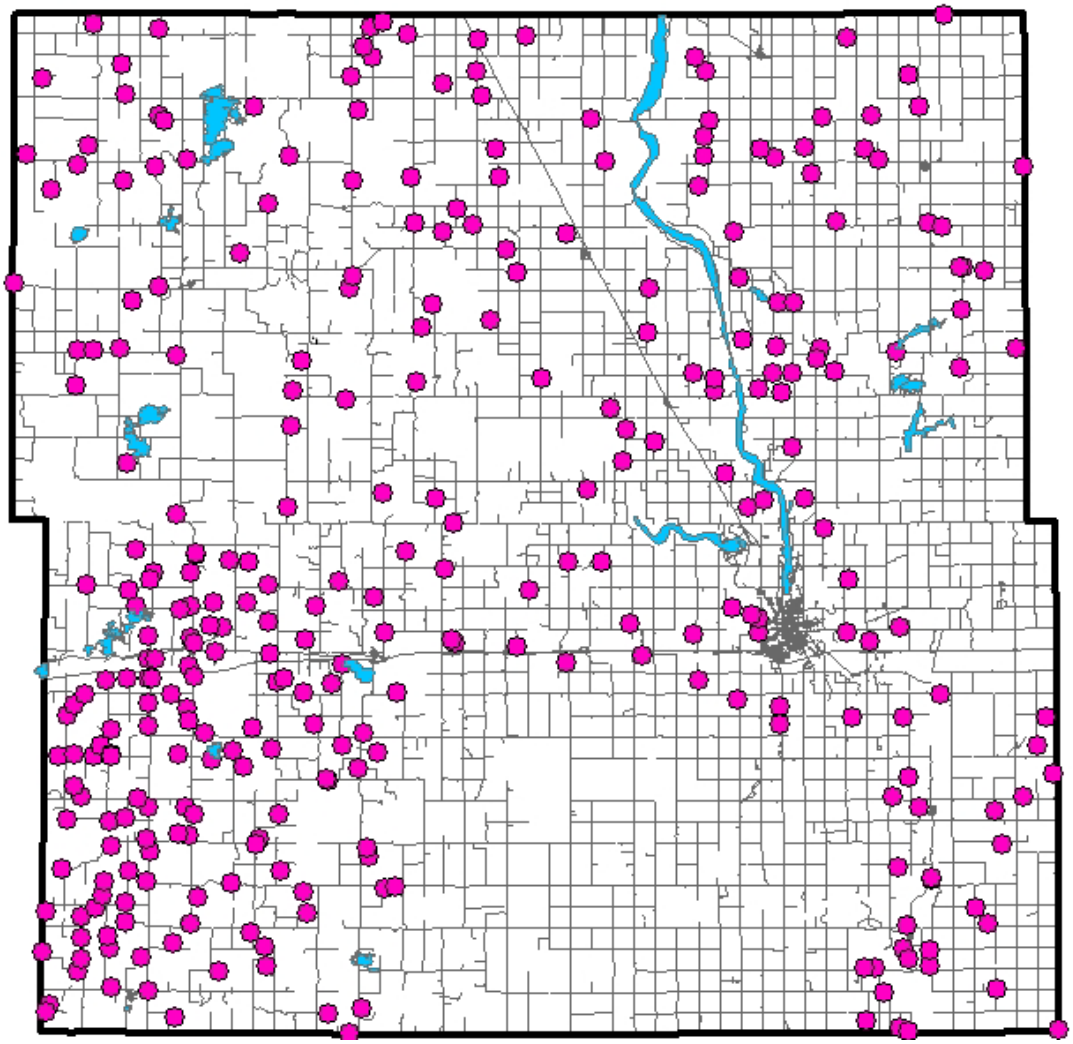


Figure 2 Animal Feeding Areas in Stutsman County

(Excluding areas in the Beaver Creek and Seven Mile Coulee Watersheds)

2.0 Goals, Objectives, and Activities

The primary goal of the project was to protect the recreational and aquatic uses of water bodies in Stutsman County. By addressing proper management of manure associated with livestock feeding areas.

Secondary goals of this project include addressing partial manure management systems and where possible addressing any facilities in sensitive groundwater areas.

Objectives and Tasks

Objective 1:

Improve livestock manure management in Stutsman County. By the end of the project period, improve the livestock manure management on 3 animal feeding operations and improve management on 21 partial manure management systems which are in sensitive areas for Stutsman County water bodies of concern.

Task 1: Provide assistance to livestock producers for installation of 3 livestock manure management systems in coordination with other programs such as EQIP through NRCS.

> ***Planned Product:*** 2 livestock manure management systems with manure management plants.
>
> ***Actual Product:*** Finished phase 2 of a livestock manure management system.

Task 2: Provide assistance to livestock producers for installation of 8 partial livestock manure management systems in coordination with other programs such as EQIP through NRCS.

> ***Planned Product:*** 8 partial livestock manure management systems.
>
> ***Actual Product:*** Provided assistance to 22 producers to improve or install partial livestock manure management systems. Producers installed 1757 acres of cover crops, 157,417 ft of fence ranging from single electric to 4 strand barb, 139.8 acres of hayland planting, 11,927 ft of pipelines, 3 rural water hook ups, 4 wells for livestock installed, 16 water tanks, 3391 ft of portable windbreaks, and 5000 tons of waste utilizations.

Task 3: Conduct follow-up contacts to assist with conservation plan updates and monitor Operation and Maintenance of cost-shared practices.

> ***Planned Product:*** Database of applied BMP's
>
> ***Actual Product***: Created Database of applied BMP's. Also do regular phone calls with producer so see how conservation practices are working.

Objective 2:

Increase the publics' understanding of the impacts of solutions to NPS pollution and livestock manure management.

Task 4: organize and conduct scheduled I/E events focusing on livestock manure management and NPS pollution control within livestock systems and coordinate them with other state/federal/privately sponsored I/E programs.

Planned Product: 5 tours/demonstrations, 5 information meetings and workshops.

Actual Product: 3 tours/ demonstrations on winter feeding, riparian grazing, and cropland management on no-till systems. 2 informational meetings.

Task 5: Prepare newsletters and direct mailings to local land users, the public, and media to promote the project and disseminate information on water quality and livestock manure management.

> ***Planned product***: Minimum of 5 newsletters and 5 direct mailings.
>
> ***Actual Product:*** 14 newsletters send out and 2 direct mailings. Newsletters contained current conservation issues including the 5 principles of soil health, drought conditions, wind erosion etc.

Task 6: complete annual and final project reports to update the project progress and completion. These will be provided to NDDEQ, EPA, sponsors, and all other interested organizations and individuals.

> ***Planned Product:*** Annual and final project reports.
>
> ***Actual Product:*** 4 annual reports and this final report.

Objective 3:

Document the estimated nitrogen and phosphorus load reductions associated with the manure management systems installed by the project.

Task 7: Maintain a record of locations, amounts and costs of applied BMP and utilize the Animal Feedlot Runoff Risk Index Worksheet (AFRRIW) to estimate the nutrient load reductions associated with the completed manure management systems.

> ***Planned Product:*** Records of all cost-shared BMP and estimated annual nitrogen and phosphorus load reductions associated with each manure management system supported by the project.
>
> ***Actual Product:*** All records are located both on the data tracker database and producer files located at the Stutsman SCD. Load reductions have been

calculated using the AFRRIW for all applied facilities. This information has been provided to the NDDEQ.

2.1 Planned and Actual Milestones, Products and Completion Dates

Table 1. Watershed Project Milestone Table.

Goals/Objectives	2017	2018	2019	2020	2021	2022	Completion Info.
Task 1: Install 2 livestock manure management systems	X						Completed November 2017 Quantity: ½ waste management system installed.
Task 2: Install 8 partial livestock manure management systems	X	X	X	X	X	X	Completed November 2022 Quantity: Worked with 22 producers to install partial livestock manure management systems.
Task 3: Follow-up contacts and monitor O&M agreements	X	X	X	X	X	X	Completed November 2022 Quantity: 23 Full and partial systems
Task 4: Conduct I/E events on livestock manure management with other agencies	X	X		X			Completed February 2020 Quantity: 3 tours, 2 informational meetings. 1 winter feeding tour, 1 riparian grazing tour, 1 no-till operation tour. 1 pollinator meeting and 1 getting to know your ground workshop.
Task 5: Educate land users, media and the public on water quality and livestock manure management	X	X	X	X	X	X	Completed November 2022 Quantity: 14 newsletters, 2 directs mailings, and multiple post on Facebook. Topics included grant updates, current conditions and how we can try to implement BMPs to slow drought and erosion.
Task 6: Complete the annual/final project reports and provide them to the necessary agencies and all other interested parties		X	X	X	X	X	Completed December 2022 Quantity: 4 annual reports and this final report have been submitted.
Task 7: Maintain records of the location, amount and cost of applied BMP's while collecting water quality/biological data as recommended by the North Dakota Department of Environmental Quality	X	X	X	X	X	X	Completed December 2022 Quantity: 22 producer files and completed AFRRIW's

2.2 Evaluation of Goal Achievement and Relationship to the State NPS Management Plan

The goal of the project is to restore the recreational and aquatic uses of water bodies in Stutsman County through a reduction in the nutrient loading from runoff off of animal feeding operations. This was accomplished through the installation of ½ full manure management system and 22 partial manure management systems. Using the Animal Feedlot Runoff Risk Index Worksheet (AFRRIW), total nutrient reductions are 17,307 lb. of N, 8,365 lb. of P, and 62,528 lb. of BOD from the 14 partial manure management systems installed. Of the numbers provided we partnered with Ducks Unlimited on two of the partial manure systems. From the totals above total nutrient reductions included 2,164 lb. of N, 981 lb. of P, and 7,490 lb. of BOD from the 2 systems.

3.0 Best Management Practices Developed

Table 2 BMP's Established in Watershed Project.

BMP Type funded by 319	Units
Cover Crops	1,757 ac
Fencing Barbed	110,997 ft
Fencing Single Wire Electric	22,488 ft
Fencing Multiple Wire Electric	23,932 ft
Pasture/Hayland Planting	139.9 ac
Pipelines	11,927 ft
Rural Water Hookup	3
Trough and Tank	16
Well (Livestock Only)	4
Phase II Waste Management System	1
Portable Windbreaks	3,391 ft
Waste Utilization	5,000 tons

4.0 Coordination Efforts

4.1 Coordination from Other State Agencies

Pheasants Forever has been a valuable resource for helping with educational events. They promoted the pollinator tour. Pheasants Forever also has a project through 319 in the SE corner of North Dakota the dips into the southern part of Stutsman County that will provide additional resourced for producers in this area.

Ducks Unlimited has provided additional funds for partial manure management systems through the Outdoor Heritage Fund. This effort has benefitted the Stutsman Manure Management Project by both providing an additional planning resource and by allowing more producers to be reached.

North Dakota State University Extension Service has been a very valuable resource for coordination of producer educational events. Many field tours have been conducted in coordination with NDSU Extension Service personnel. Many of the speakers during workshops and field tours have been NDSU Extension Service Personnel.

4.2 Other State Environmental Program Coordination

Project staff have also been active supporters of the State Eco-Ed program. The program works to educate 6th grade students on environmental topics such as erosion and NPS pollution. Project staff has conducted stations dealing with these topics. Project staff have also been regular participants in the State Envirothon Program, and environmental competition for high school students.

4.3 Federal Coordination

The project has been closely coordinated with the Natural Resources Conservation Service (NRCS). Project staff have used office space and computers provided by NRCS. Other equipment such as vehicles has been provided at times from NRCS. NRCS staff has reviewed almost all conservation practices in plans and after application. NRCS staff has provided coordination and speaking in education events, such as workshops and tours. NRCS has provided some of the engineering for the structural practices, such as water developments and manure management systems. NRCS has also provided technical services for our projects.

4.4 USDA Programs

As mentioned previously, EQIP was utilized whenever possible to find the "best fit" for producers in the watershed area. Below is a table showing USDA program financial inputs and BMPs installed.

Table 3 Cumulative USDA BMPs throughout Stutsman County 2017 through 2022

USDA Funded BMP's	Amount	Cost-Share Paid
Cover Crops	13,174.2 ac	$479,303.60
Critical Area Plantings	29.4 ac	$6,528.20
Fence	67,303.3 ft	$67,965.60
Forage and Biomass Planting	351.4 ac	$28,897.40
Livestock Pipeline	24,121 ft	$55,021.50
Pasture and Hay Planting	97.3 ac	$5,777.40
Prescribed Grazing	1,289.4 ac	$8,953.50
Pumping Plant	12	$84,690.30
Residue and Tillage Management, No Till	15,969.7 ac	$257,851.30
Water Well	9	$62,731.40
Watering Facility	29	$80,837.50

4.5 Accomplishments of Agency Coordination Meetings

The Stutsman County Soil Conservation District board oversees and guides the watershed projects and has worked in coordination with the staff from NRCS field office, NRCS Area Specialists, and specialists from the NDSU Carrington Research Extension Center (CREC) and the Central Grasslands Research Station at Streeter, ND. They have partnered with Stutsman County NDSU Extension on the workshops and tours held on ani al feeding operations. Jamestown Chamber of Commerce has partnered with Stutsman County SCD to help organize and put on workshops.

4.6 Resources/Coordination from Federal Land Management Agencies

Not applicable

4.7 Other Sources of Funds

Other sources of funds are as follows:

1) Producers provided $ 282,201.71 of cost share match to the project.
2) Tractor Equipment In-kind brought in $212,726.55 of in-kind match for project.

The Stutsman County Water Resources Board provided $25,000.00 of operating cash for the project and the Stutsman County Soil Conservation District provided $5,000.00.

5.0 Summary of Public Participation

Producers were supportive of the project from start all the way to the end. I believe this project got producers talking with each other and getting other producers coming in asking about the program. Producers would come in asking about the program and looking at ways to incorporate it into their systems.

Producer cost-share match amounted to $282,201.71. As noted in section 4.7, local businesses and producers provide some of the in-kind for the project as well as many other entities.

6.0 Aspects of the Project That Did Not Work Well

Public outreach was a struggle for this project for workshops and other educational events. With COVID starting in 2020 it limited what we could do to provide this information to the public. We still put out newsletters and information on Facebook. Getting back in the groove of putting workshops has been a struggle for getting these services going again.

7.0 Future Activity Recommendations

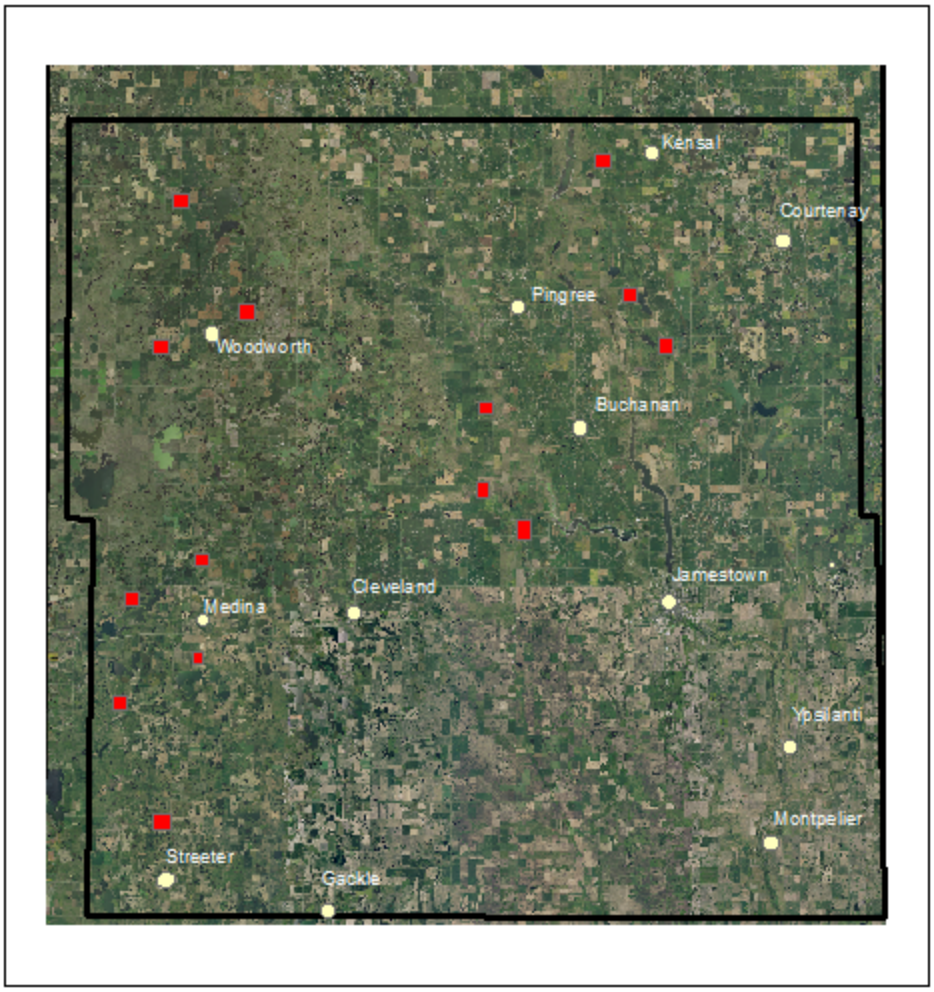
Interest in Stutsman County for full and partial manure management systems is still very high. Phase II was still utilizing dollars all the way down to the last month of the grant. We plan to still hold public winter-feeding events and workshops.

Regardless of funding, project, district, DU, and NRCS staff will continue to monitor implemented practices. In particular manure management systems to determine compliance to contracts.

Appendix A

BMP Map

Map of Manure Management Systems Implemented Through the Stutsman County Manure Mangemetn Phase II Project



Legend

- Partial Manure Management Systems
- Towns and Cities Throughtout Stutsman

Appendix B

Manure Management Definitions

Animal Feeding Operation

An animal feeding operation (AFO) is defined as a lot or facility where:

1. Animals are or will be confined for 45 days or more during any 12-month period; and

2. Livestock are concentrated such that the normal vegetation (grass or crops) are not sustained (winter or summer).

Small and medium AFO's for beef cattle are considered to be less than 1,000 animal units.

Full Manure Management System

Due to their size and concentration, the owners of these animal feeding operations (AFOs) may be required to obtain a permit from the North Dakota Department of Environmental Equality, and this usually involves implementation of structural practices such as diversions, storage ponds, dikes, solid separators etc. Operations that obtain a permit are considered to be full manure management systems.

Partial Manure Management System

A partial manure management system eliminates the need for a permit by spreading out the feeding by rotating livestock winter feeding areas so that concentration in any area does not happen longer than 30 to 45 days, thus eliminating the need for structural practices.

Appendix C

Sample of Project Information and Educations

Stutsman County Soil Conservation District

Winter Feeding and Grazing Tour

Join Us On Tuesday, February 27, 2017 at 1:00

Tour Stops Include:

- Brian Amundson—Winter Grazing and Feeding
- Jason Odenbach - Winter Grazing and Feeding
- Discussion of Programs Available for producers

A dinner will be served after-

Meet at Brian Amundson's headquarters for coffee/pop and cookies at 1:00pm and Bundle Up! Directions from Jamestown: North on Hwy 281 for 10 miles, east on Brian's driveway for 1/2 mile.

For more information call the Stutsman Co. Soil Conservation District at 701-252-2521 ext. 3

No-till Operation on Jeremy Wilson Farm Tour

Rotational Grazing Near Lakes and Streams Tour

conserving natural resources for our future

Join Us On Tuesday, June 27, 2017 at 1:00 in Buchanan ND across from the Buchanan Bar

♦ ***Hosted by:*** *NDSU Extension Service and the Stutsman County Soil Conservation District*

Tour Stops Include:

♦ *Brian Amundson – Demonstrating effective techniques in grazing near streams and reservoirs*

♦ *Mark Krueger – Demonstrating grazing programs and techniques*

NDSU NORTH DAKOTA STATE UNIVERSITY

For more information call the Stutsman Co. Soil Conservation District at 701-252-2521 ext. 3

Stutsman County SCD

Stutsman County Soil Conservation District | August 2021 | www.stutsmanscd.net

Soil Movement

Soil Erosion Event Darkens the Skies

Local SCD Works With Producers to Improve Soil Health

By the Stutsman County Soil Conservation District

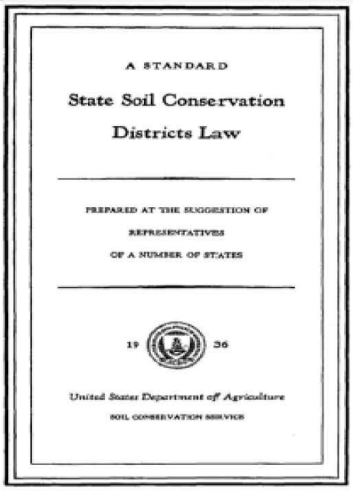
March 30, 2021 the winds came and soils left unprotected blew - relocated across the county's landscape including vegetated areas, farmsteads, streams, rivers and lakes….and even highway rest stops.

Sediment and nutrients are deposited in road ditches becoming a barrier to water flow.

Wind erosion is not a new problem for fields in the county. In 1937, because of severe wind erosion across the United States, President Franklin Roosevelt sent a letter to all governors. It included proposed legislative language called the "*Standard State Soil Conservation Districts Law*". One month later the 1937 Legislative Assembly adopted the language and the local conservation movement began.

Unfortunately, eighty-four years later, soil erosion is still a significant problem for Stutsman County and the state. The rich topsoils found across the state are being lost. In some areas, over fifty percent of topsoil is gone. In addition, the erosion carries away organic matter and essential nutrients like nitrogen and phosphorus, which can reduce productivity of the remaining soils. Eventually some of the eroded soils and nutrients are deposited in streams and lakes. The soils fill up the waterbodies and the nutrients feed blue-green algae that cause harmful algal blooms (HABs). HABs can make people ill and can kill pets and livestock that ingest the toxins produced by the algae. Locally, Spiritwood Lake is one of several lakes in the state that experience frequent algal blooms that limit recreation activities.

The Stutsman County Soil Conservation District (SCD) is one of 53 districts created by county residents. The 1937 law gives the SCD the mission to "*provide for the conservation of the soil and soil resources of this state and for the control and prevention of soil erosion.*" To achieve this mission, the SCD supervisors and staff work with partnering agencies, such as the Natural Resources Conservation Service (NRCS), to address local soil and water resource concerns.



A STANDARD

State Soil Conservation Districts Law

PREPARED AT THE SUGGESTION OF REPRESENTATIVES OF A NUMBER OF STATES

19 36

United States Department of Agriculture

SOIL CONSERVATION SERVICE

To specifically address soil erosion, the SCD recommends producers practice the five principles of soil health:

- soil armor
- minimizing soil disturbance
- plant diversity
- continual live plant/root
- livestock integration.

Practices that build soil health should be managed as a system that leaves previous crop residue on the soil, minimizes tillage, increases the number of crops in a rotation and incorporates cover crops into the annual crop rotations. The most difficult principle to incorporate into a soil health management system can often be the addition of livestock grazing on the cover crops and crop residues. However, the SCD can help match livestock and cropland producers to benefit both.

SCD staff stand ready to help provide technical assistance and to help identify potential financial assistance to help producers begin improving soil health. To find out more contact the Stutsman County SCD at 252-1920 ext. 3.

Photo Credit: Stutsman County Soil Conservation District..

Newsletter Articles