

Stutsman County Livestock Manure Management Program Phase II

Project Summary Sheet

PROJECT TITLE: **Stutsman County Livestock Manure Management Program Phase II**

NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR/SUBGRANTEE:

Stutsman County Soil Conservation District

1301 Business Loop E

Jamestown, ND 58401

STATE CONTACT PERSON: **Greg Sandness**

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STATE: **North Dakota**

WATERSHED: **Stutsman County**

HYDROLOGIC UNIT CODE: **10130103, 10160001, 10160002, 10160003, 09020203 (within Stutsman County)**

HIGH PRIORITY WATERSHED (yes/no): **Yes (Not covered by a current project includes stretches on the Upper James River Watershed)**

PROJECT TYPE

WATERBODY TYPE

NPS CATEGORY

Watershed

Lakes/Reservoirs, Rivers

Agriculture

Streams, Wetlands

PROJECT LOCATION: **Stutsman County: 46.896155N 98.69025W**

SUMMARY OF MAJOR GOALS: **The primary goal of this project is to restore the recreational and aquatic uses to priority water bodies in Stutsman County. This will be accomplished by focusing on properly handling livestock manure. Animal Feeding Operations will be brought into compliance with current regulations.**

PROJECT DESCRIPTION: **Stutsman County is a county located in southeast North Dakota. The area of the county is approximately 2,298 square miles. Recent estimates, through planning at the Stutsman County Soil Conservation District, have shown that there are over 160 square miles in Stutsman County that are covered by water bodies (approximately 7% of the surface area). Areas of greatest concern are the Upper James River Watershed (10160003) between Jamestown and the county line. Natural Resource Management stressor of greatest concern for this project is the livestock densities in feeding operations.**

FY 2017 Section 319 Funds Requested \$600,000

Match: \$400,000

Other Federal Funds: \$500,000

Total Project Cost: \$1,500,000

319 Funded Full Time Personnel: 0.6

2.0 STATEMENT OF NEED

- 2.1** Stutsman County contains portions of 5 major (8-digit hydrologic unit) basins. These include the Middle Sheyenne River (09020203), the James River Headwaters (10160001), the Pipestem River (10160002), the Upper James River (10160003), and the Apple Creek/Long Lake (10130103). According to the NDDH 2014 Integrated Report, primary sources of *E. coli* and fecal coliform bacteria that pollute our waters are from animal feeding operations and riparian area grazing. They are also the primary cause of recreation use impairment in North Dakota. With the ability to properly manage manure on these feeding operations the number of pathogens (and other pollutants) will decline. Nitrates found in manure also affect our state's rivers and streams by causing excessive nutrient loading which stimulates plant growth and will deplete oxygen levels in the water.

Currently, the Section 319 Phase I Stutsman County Manure Management Project has been highly successful. Through this project, 3 animal feeding operations have been updated and permitted and over 30 partial manure management systems have been completed. Along with this project, the Beaver Creek/Seven Mile Coulee Watershed Project Phase I and Phase II projects and an Outdoor Heritage Project have implemented many manure management practices. These systems are shown on Figure 4. These projects have used all of their funding for implementation and will be completed by December 2016.

Some of the water bodies that have been affected by these projects are assessed and listed under the 303(d) and 305(b) Integrated Report. These include the James River system (including Mud Lake, Jim Lake, Jamestown Reservoir, and the James River in these areas), and the Pipestem Creek system (including Pipestem Creek, Unnamed Tributary, and Pipestem Reservoir). Designated uses of these water bodies include recreation, fish, and other aquatic biota and all have use support listed as fully supporting but threatened. The impairments to these water bodies include Nutrient/Eutrophication, *E. coli*, and Fecal Coliform.

Many of the water bodies in Stutsman County are utilized for recreation and fishing. The main focus will be on the highest priority lakes. The North Dakota State Game and Fish Department developed a tiered list of water bodies for priority in fisheries. Figure 2 is this tiered list for Stutsman County and Figure 3 shows a map of these water bodies. This list sets priorities for stocking and usage based upon lake stability and ability to carry long-term fish populations. The water quality of these lakes depends largely on the surrounding watershed land uses. Livestock manure management in feeding operations is a primary concern in these watershed areas. It is a concern because, without proper manure management, these lakes will gradually become unstable and recreational use will be inhibited.

- 2.2** Project Location: Stutsman County (shown in Figure 1) 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 would focus on water bodies currently not included in a current watershed project area (i.e. Beaver Creek and Seven Mile Coulee).

Major Land Resource Areas (MLRA) include the Central Dark Brown Glaciated Plains (53B) on the western side of the county and the Central Black Glaciated Plains (55B) on eastern side of the county.

2.3 Maps

See Figures 1-5

2.4 General Information

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 main focus will be on management of AFOs within the watersheds for the priority lakes (Figures 2 and 3).

The topographic relief in Stutsman County is lower in the eastern side of the county with the Drift Prairie. The elevation is much lower with a low point of approximately 1,340 feet in the James River Valley in the southeastern part of the county. The western side of the county has much higher topographic relief in the Missouri Couteau and west of the Missouri Escarpment. This area has much higher elevation with the escarpment itself rising an average of 300 feet within a short distance. The highest point in Stutsman County is located northwest of Woodworth, in Section 10 of Gerber Township, with an elevation of approximately 2,140 feet.

The climate of Stutsman County is characterized as humid continental. Typically, it is warm to hot and often humid in the summer and has cold to sometimes severely cold winters. Mean average temperatures range from 70 degrees F in July (warmest month) to 9 degrees F in January (coldest month). On average there are about 136 frost free days in Stutsman County.

Precipitation mainly occurs in the summer months with the month of June averaging 3.46 inches of moisture for the highest total. Winter months are generally much drier with December averaging only 0.43 inches and February averaging 0.41 inches of moisture. The yearly average for snowfall from 1951 to 2010 is 39 inches. The average precipitation is approximately 19 inches annually.

Soils in Stutsman County include: a) level to very steep loamy soils on glacial till plains and moraines (84% of soils); b) level to undulating, silty soils on lake plains (1% of soils); c) level to undulating, loamy and sandy soils on mantled till plains and outwash plains (3% of soils); d) level to steep, loamy soils on outwash plains (5% of soils); e) level to very steep, loamy and silty soils in stream valleys (7% of soils).

Land use in Stutsman County is dominated by agriculture. Land uses include: cropland 45.45%, rangeland and grasses 38.93%, water areas 7.21%, developed 4.28%, hayland 3.68%, and trees/shrubs 0.45%.

Stutsman County geology is dominated by two distinctly different groups of glacial landforms. The first is the Missouri Couteau that resulted mainly from glacial stagnation. During the Wisconsin Era of glaciation, the Missouri Escarpment was largely responsible for restricting the southward and westward movement of the glacier. This 300 foot rise in elevation has been and is the single greatest influence on the drainage patterns in Stutsman County.

Landforms within the Missouri Couteau include: the Streeter end moraine, hummocky stagnation moraine, perched lacustrine (lake) plains, a large pitted outwash plain, ice restricted outwash plains, and an ice-walled gravel train (extending from southwest of Woodworth to near Goldwin). The large pitted outwash plain, which is located to the southwest of Woodworth, and the ice-restricted outwash plains, near Medina and Streeter, developed because of glacial meltwater flowing west to the Missouri River. The Marstonmoor and Medina aquifers underlie a large portion of this area in western Stutsman County.

The hummocky moraines of the Missouri Couteau are characterized by multiple closed basin drainages. This area is often termed the Prairie Pothole Region of North Dakota. The actual area of the Missouri Couteau and the associated Missouri Escarpment extends from Iowa all the way into Canada.

The second group of glacial landforms in Stutsman County is the Drift Prairie. Actively retreating and advancing ice planed the landscape east of the Missouri Escarpment, resulting in ground moraines with low relief. Except for areas with glacial landforms, such as recessional moraines, kames or eskers, this low relief created large areas of poorly drained soils.

With the retreat of the glacial ice sheet to the north and east, melt-water flowing to the south created the Pipestem Creek, Minneapolis Flats Creek, Beaver Creek, Seven Mile Coulee, Streamen Coulee and the James River valleys. Spiritwood Lake and associated drainage-path lakes such as Rudolph and Blue Lakes also exist in these outwash valleys.

Several "shallow" aquifers in Stutsman County consist of sands and gravel (glaciofluvial sediments) which are exposed at the surface and recharge through precipitation. The aquifers classified in this category include: the Medina North and South Aquifers, the much larger Central Dakota Aquifer, the Pipestem Creek Aquifer, the Seven Mile Coulee Aquifer, among others. Yields from 50 to 500 gallons per minute have been obtained from many of these aquifers. These type of aquifers are the most likely to be affected by surface activity including livestock manure.

Groundwater dependent community public water systems in Stutsman County include Woodworth, Medina (2), Streeter, Jamestown and Stutsman Rural Water District. There are no surface water dependent public water systems in Stutsman County.

According to the 2013 North Dakota Agriculture Statistics, in 2010 there are 1,043 farms in Stutsman County with an average size of 1,144 acres. The county has the largest number of

farms compared to the rest of the counties in North Dakota. The total acreage in these farms is 1,193,200 acres which also is the largest number in any county of North Dakota.

Livestock in Stutsman County have been a major part of agriculture. The numbers and species produced, though, have declined in the past 10 years. Very few, if any, hogs or poultry are produced for sale, milk cows have declined dramatically in numbers, along with fewer cattle and sheep. Beef cattle, though, have remained the largest livestock sector in Stutsman County. According to USDA NASS (2013), in 2013 Stutsman County had approximately 57,000 head of cattle on livestock operations and 27,000 of these were beef cows. Figure 5 shows a distribution of livestock feeding areas in all areas of Stutsman County (excluding Beaver Creek and Seven Mile Coulee watersheds). Using aerial photography, staff from the Stutsman County SCD estimated there are 309 current animal feeding areas (number of areas and locations, excluding Beaver Creek and Seven Mile Coulee watersheds) in Stutsman County.

2.5 Water Quality Problem Definition

A large number of the animal feeding areas identified above are not contributing to water quality degradation in the water bodies of Stutsman County. This is due to a small number of animals and in particular many being located in non-contributing areas. However, there are some animal feeding operations in Stutsman County which can contribute nutrients and fecal bacteria to water bodies. Water bodies of particular concern are those being utilized for uses such as recreation and fisheries. These water bodies have been identified in Section 2.1 and are identified on Figure 3. This project will focus on animal feeding operations and their contribution of E. coli bacteria, nitrogen and phosphorus to these water bodies.

3.0 Project Description

3.1 Goals

The primary goal of this project is to protect the recreational and aquatic uses of water bodies Stutsman County. This will be accomplished by focusing on addressing proper management of manure associated with 3 livestock feeding areas with an average size of 500 head of cattle.

Secondary goals of this project include addressing up to 21 partial manure management systems, with an average herd size of 150 head of cattle. Where possible we would address any facilities in sensitive groundwater areas.

Both the primary and secondary goals will be within the watersheds for the priority lakes.

3.2 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.

Product: 2 livestock manure management systems with manure management plans.

Cost: \$500,000

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.

Product: 8 partial livestock manure management systems.

Cost: \$294,850

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

Product: Database of applied BMP's.

Cost: Included in Personnel/Support in Part 2 of Funding Tables.

Objective 2: Increase the publics' understanding of the impacts and 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/private sponsored I/E programs.

Product: 5 tours/demonstrations, 5 informational meetings and workshops.

Cost: \$2,500

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

Product: Minimum of 5 newsletters and 5 direct mailings.

Cost: \$3,500

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

Product: Annual and final project reports.

Cost: Included in Personnel/Support in Part 2 of Funding Tables.

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 the 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 system.

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.

Cost: Included in Personnel/Support in Part 2 of Funding Tables.

3.3 Milestone Table: See Figure 6.

3.4 Permits

All necessary permits will be acquired. Project will work with NDDH to determine if permits are needed for the proposed livestock manure systems. State and County permits will be obtained for manure management systems installed by the project. Cultural Resource concerns and issues will be addressed by following the procedures outlined by NDDH and the North Dakota State Historical Society.

3.5 Appropriateness of Lead Sponsor

The Stutsman County SCD is sponsoring this water quality project. The Stutsman SCD board will oversee the Stutsman County Livestock Management Program. The Stutsman County SCD's annual and long range plans help to prioritize and provide guidance to the field service staff. The Stutsman County SCD board has legal authority to employ personnel and receive and expend funds. The Stutsman County SCD has credible experience in personnel management and conservation leadership.

4.0 Coordination Plan

4.1 Lead Project Sponsor and Cooperating Organizations:

- 1) The Stutsman SCD will be the signer of the Section 319 contract and will be the lead agency responsible for project administration. They and NRCS will provide office space, clerical assistance, access to equipment and supplies as well as any necessary financial support. The Stutsman County Board will oversee implementation of the scheduled project activities and provide for staff time if feasible. The board will be the primary supervisor of the watershed conservationists and all Section 319 funded activities.
- 2) The Natural Resources Conservation Service (NRCS) will provide assistance in conservation planning, plan writing, and technical/engineering assistance for construction and installation of planned BMP's. NRCS will also provide cooperating project funds through the Environmental Quality Incentives Program (EQIP). This partnership is operated through MOU.

- 3) NDDH will assist project staff in development and implementation of the projects' I/E activities. NDDH will provide sponsor oversight to ensure proper management and expenditures of Section 319 funds. They will assist NRCS and the Stutsman County SCD personnel in the review of Operation and Maintenance requirements for Section 319 cost shared BMP's.
- 4) Barnes Co. SCD will assist the project applicants in engineering assistance for livestock manure management programs and other structural practices which will be provided by the BMP team project managed by the Barnes Co. SCD.
- 5) The North Dakota State University Extension Service local and state personnel will assist in working cooperatively on information and education activities. This will include such items as workshops, field tours, and publications. The nutrient management specialist from NDSU Extension (funded through the Section 319 program) will provide assistance in development of nutrient management plans including livestock manure management.

4.2 Local Support

The Stutsman County SCD has already received 12 requests for assistance from livestock producers for this project and they have plans underway for their livestock manure management systems.

4.3 Coordination with Other Pertinent Programs

Other programs in the project area include:

- 1) NRCS Environmental Quality Incentives Program (EQIP) will be used by the NRCS Jamestown Field Office and 319 staff to plan relevant livestock manure management systems. EQIP will provide cost-share for some of the practices, while 319 will provide cost share for the remaining practices not addressed through EQIP.
- 2) NDSU Nutrient Management Educational Support Program is a program funded for technical and educational assistance for livestock producers in North Dakota. Information and technical assistance will be utilized from this program in cooperation with this conservation effort. Planning and educational efforts in Stutsman County will be enhanced through cooperation with the Livestock Manure Management specialist in Carrington. (As mentioned in item #5 from Section 4.1)
- 3) The NPS BMP Team will be utilized for project engineering design and construction. Project in-kind will be used to assist with engineering costs associated with these projects.
- 4) SCD staff will continue to seek additional funds through programs like the Outdoor Heritage Fund.

4.4 Similar Watershed Activities

As mentioned in item #1 of Section 4.3, the EQIP program will be used in coordination with this program as has been previously demonstrated by other conservation efforts in Stutsman County. The EQIP program is currently based on a county wide scale and is used cooperatively with 319 efforts. The Stockmen's Association Environmental Services Program and ND Dept. of Agriculture's Livestock Pollution Prevention Program also work with producers to develop manure management plans. Duplication of effort is avoided by these programs' policies of avoiding areas like Stutsman County who have similar projects and funding available. This will continue as this program is available in Stutsman County. In areas where other 319 programs are available, such as the Spiritwood Lake Watershed Project, this funding will not be utilized unless specifically requested by the Stutsman SCD and the North Dakota Department of Health.

5.0 Evaluation and Monitoring Plan

In order to monitor and plan for a feedlot the Animal Feedlot Runoff Index Worksheet (AFRIIW) is used. This worksheet takes numerous factors into account like the type of animal, average weight, number of days confined, surface type, slope of the area and many more. After inputting these values, the total tons of manure are calculated first, then the amount of nitrogen, phosphorus and BOD₅. Loading values can then be calculated with the amount of nutrients, precipitation, lot and risk factors. See Figure 6 for an example of the AFRIIW.

6.0 BUDGET

6.1 See Budget Tables Section.

7.0 PUBLIC INVOLVEMENT

As mentioned in objective 3, an important part of this project will be educational efforts and public involvement. Through the Stutsman County Manure Management Project the Stutsman County SCD and NRCS Jamestown Field Office have an established track record of good public involvement. This includes well attended tours of established conservation practices, well attended workshops in cooperation with the NDSU Extension, Farmers Union, and the Stutsman County Agricultural Improvement Association. This tradition will continue with the Phase II Stutsman County Manure Management Program.

Newsletters are regularly published by the Stutsman County SCD and will continue to provide project information to the general public. The Stutsman County SCD has a website, www.stutsmanscd.org, which provides 319 project information plus links and publications.

Progressive and involved producers as mentioned in Section 4.2 will continue to provide "word of mouth" information to others in the watershed areas.

BMP Budget Table

Animal Manure Systems

(Livestock Manure Management Plans and Acres are included in practice 590 as listed above.)

Practice:

Partial Livestock Manure Systems	8 @ \$36,856.25	\$294,850
312 Livestock Manure Mgt. System	2 @ \$250,000	\$500,000

40% Producer Share **\$317,940**

60% 319 Share **\$476,910**

Total BMP Costs \$794,850

Typical Livestock Manure Management System practice items include:

- Fence (removal, windbreak, feedlot)
- Diversions (clean and dirty water)
- Waste water ponds
- Dikes
- Heavy use pads
- Access Roads

Typical Partial Livestock Manure System practice items include:

- Fence (electric or barbed)
- Cover Crop
- Windbreak (portable or tree planting)
- Water Developments
- Nutrient Management

**PART 1: FUNDING
SOURCES**

	2017	2018	2019	2020	2021	TOTAL
EPA SECTION 319 FUNDS						
1)FY2017 FUNDS	109,512	122,622	122,622	122,622	122,622	600,000
Subtotal	109,512	122,622	122,622	122,622	122,622	600,000
STATE/LOCAL MATCH						
1) Landowners 40% Practice Match(FA)	63,588	63,588	63,588	63,588	63,588	317,940
2) Landowners In- kind (FA)	4,710	9,080	9,080	9,080	9,080	41,030
3) Soil Conservation District Match (TA)	4,710	9,080	9,080	9,080	9,080	41,030
Subtotal	73,008	81,748	81,748	81,748	81,748	400,000
TOTAL	182,520	204,370	204,370	204,370	204,370	1,000,000

FA: Financial
Assistance
TA: Technical
Assistance

**Part 1.5 OTHER
FEDERAL FUND
SOURCES**

	2017	2018	2019	2020	2021	Total
1) Natural Resources Conservation Service (TA)	10,000	10,000	10,000	10,000	10,000	50,000
2) Environmental Quality Incentives Program,	90,000	90,000	90,000	90,000	90,000	450,000
Total	100,000	100,000	100,000	100,000	100,000	500,000

TA: Technical Assistance

Stutsman County Manure Management Project Phase II											
Part 2: Funding											
Section 319/Non-Federal Budget				2017	2018	2019	2020	2021	Total Costs	Cash/In-Kind Match	319 Funds
Personnel/Support											
1) Salary/Fringe WC* (40% of time for project)				15,000	30,000	30,000	30,000	30,000	135,000	54,000	81,000
2) Salary/Fringe WT** (20% of time for project)				5,000	10,000	10,000	10,000	10,000	45,000	18,000	27,000
3) Vehicle				1,000	2,000	2,000	2,000	2,000	9,000	3,600	5,400
4) Travel				250	500	500	500	500	2,250	900	1,350
5) Equipment/Supplies				250	500	500	500	500	2,250	900	1,350
6) Training				150	300	300	300	300	1,350	540	810
7) Telephone/Post.				200	400	400	400	400	1,800	720	1,080
			Subtotals	21,850	43,700	43,700	43,700	43,700	196,650	78,660	117,990
OBJECTIVE 1: APPLYING BEST MANAGEMENT PRACTICES											
Animal Waste Systems				158,970	158,970	158,970	158,970	158,970	794,850	317,940	476,910
			Subtotals	158,970	158,970	158,970	158,970	158,970	794,850	317,940	476,910
OBJECTIVE 2: INFORMATION/EDUCATION											
Newsletter/Video				700	700	700	700	700	3,500	1,400	2,100
Tours				500	500	500	500	500	2,500	1,000	1,500
			Subtotals	1,200	1,200	1,200	1,200	1,200	6,000	2,400	3,600
ADMINISTRATIVE											
SCD/Coordinator Meetings				500	500	500	500	500	2,500	1,000	1,500
			Subtotals	500	500	500	500	500	2,500	1,000	1,500
TOTAL 319/NON-FED.				182,520	204,370	204,370	204,370	204,370	1,000,000	400,000	600,000
*Watershed Coordinator											
**Watershed Technician											

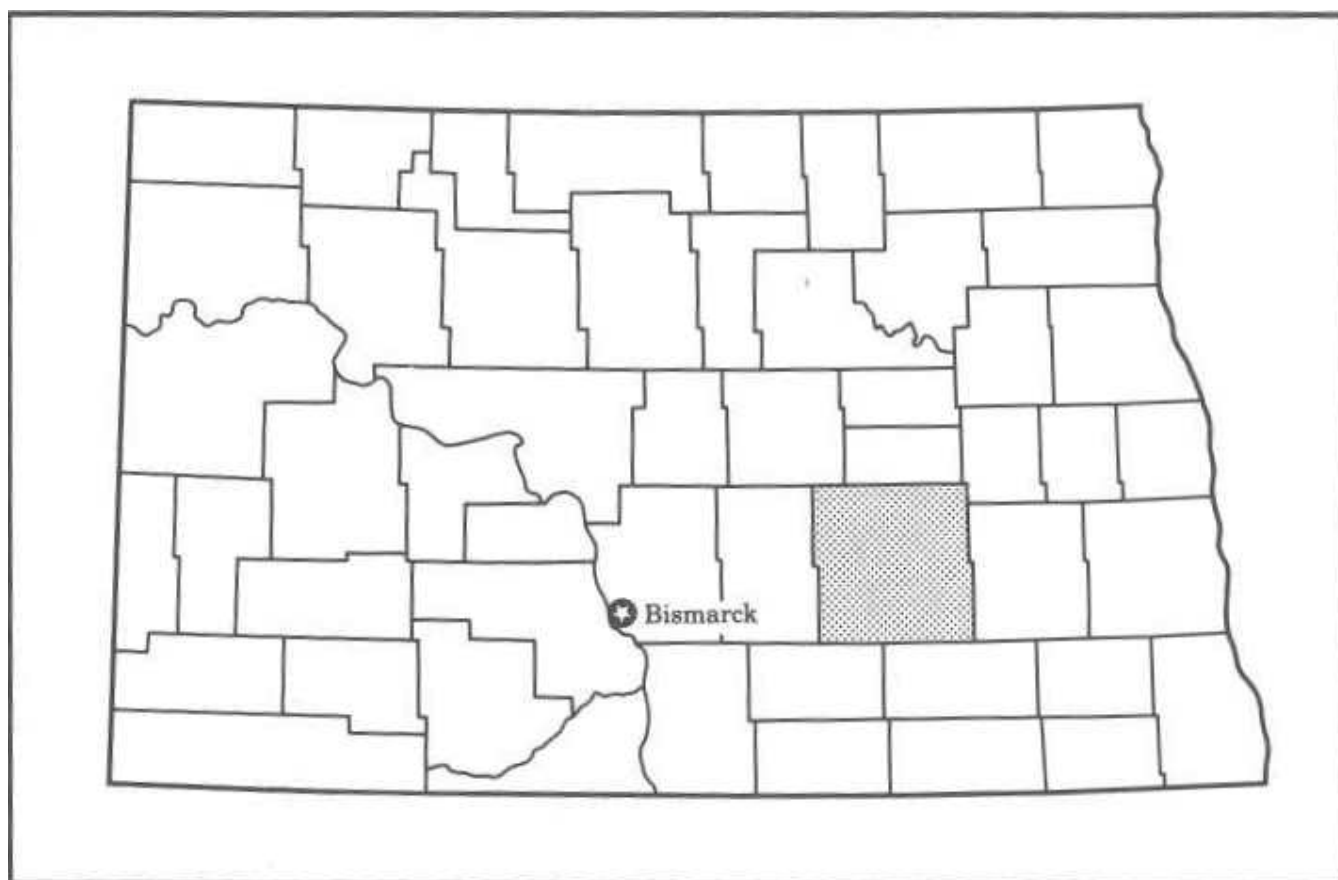


Figure 1.—Location of Stutsman County in North Dakota.

Lake Code	Tier	Water Body	County	Acres	Acre Feet	Sportfish
346	2	Barnes Lake	Stutsman	525.7	4745	NOP, WAE, YEP
400	2	James River	Stutsman	---	---	NOP, WAE
341	2	Jamestown Reservoir	Stutsman	2036.9	28,146	NOP, WAE, CRP
348	2	Pipestem Reservoir	Stutsman	1027.4	13,199	NOP, WAE, CRP
343	2	Spiritwood Lake	Stutsman	488.8	15,167	NOP, WAE, YEP
539	3	Alkali Lake	Stutsman	682.4	9,638	NOP, YEP
427	3	Bader Lake	Stutsman	224.0	2,828	NOP, YEP, WAE
599	3	Big Mallard Marsh	Stutsman	1860.1	---	NOP, WAE, YEP
340	3	Clark Lake	Stutsman	284.5	5,123	NOP, YEP, WAE
665	3	Cleveland Slough	Stutsman	468.9	---	YEP
179	3	Crystal Springs	Stutsman	134.1	766	NOP, WAE, YEP
459	3	Hehn-Schaffer Lake	Stutsman	249.2	3,200	NOP, WAE, YEP
607	3	Reule Lake	Stutsman	919.6	---	YEP, WAE
460	3	Streeter Lake	Stutsman	39.7	---	NOP, YEP
576	4	Hoggarth Dam	Stutsman	39.2	---	YEP
492	4	Little Britches Pond	Stutsman	.2	---	RBT
730	4	Mud & Pearl Lakes	Stutsman	1330.6	---	YEP
579	4	R & M Lake	Stutsman	51.7	---	YEP, WAE
592	4	Schock Lake	Stutsman	517.7	---	YEP
649	4	Sunday Lake	Stutsman	377.1	---	NOP
*CRP-Crappie *NOP- Northern Pike *RBT- Rainbow Trout *WAE- Walleye *YEP- Yellow Perch						

**This list sets priorities for stocking and usage based upon lake stability and ability to carry long-term fish populations. The lower the tier number the greater the stability and ability for populations.

Figure 2. – Stutsman County Fisheries by Tier and Lake Name.

Stutsman County Manure Management Program Priority 12 Digit Hydrologic Units

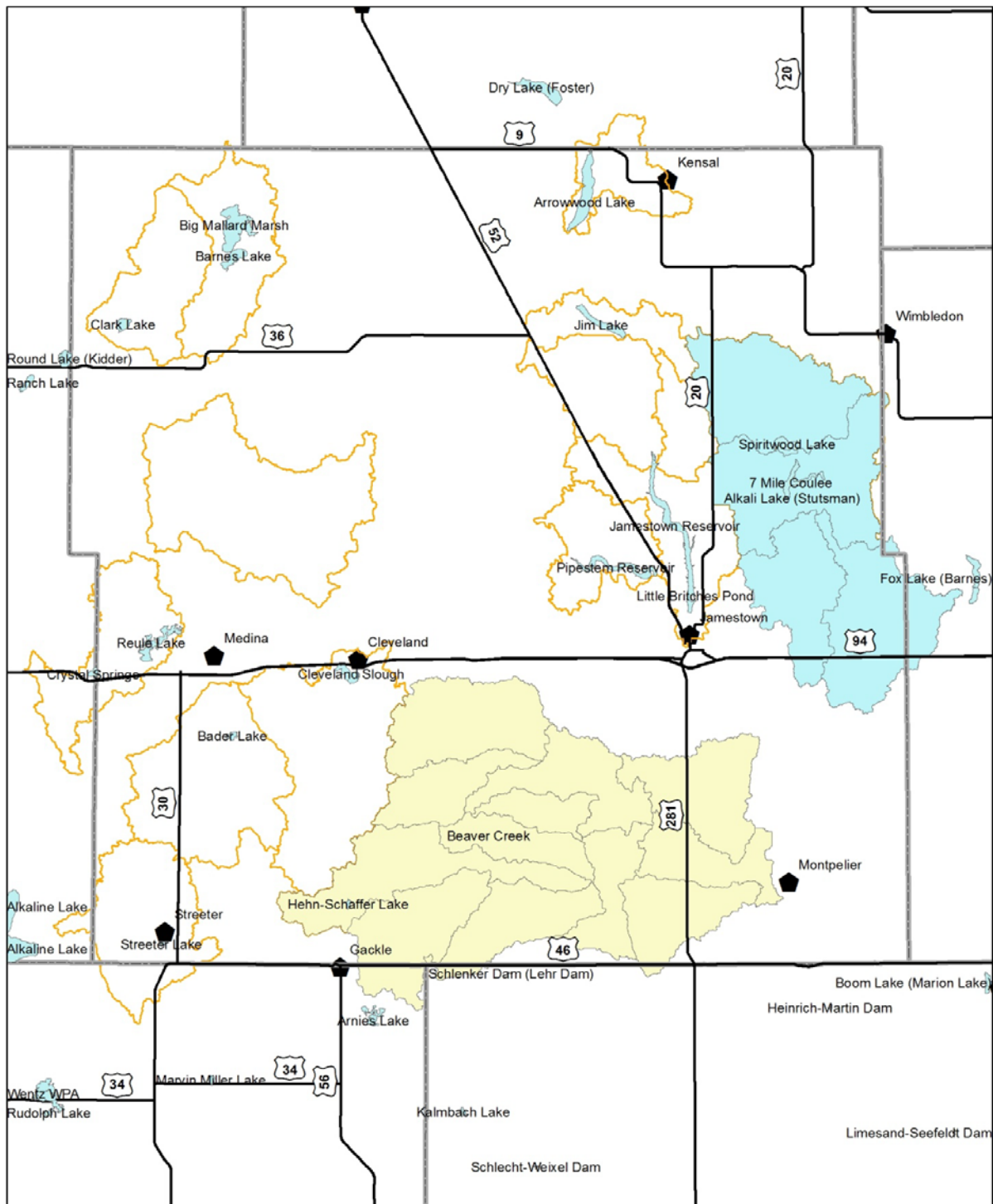


Figure 3. Map of the 12 digit HU's and where the priority lakes are located in/around them. The Beaver Creek and 7 Mile Coulee watersheds are also shown

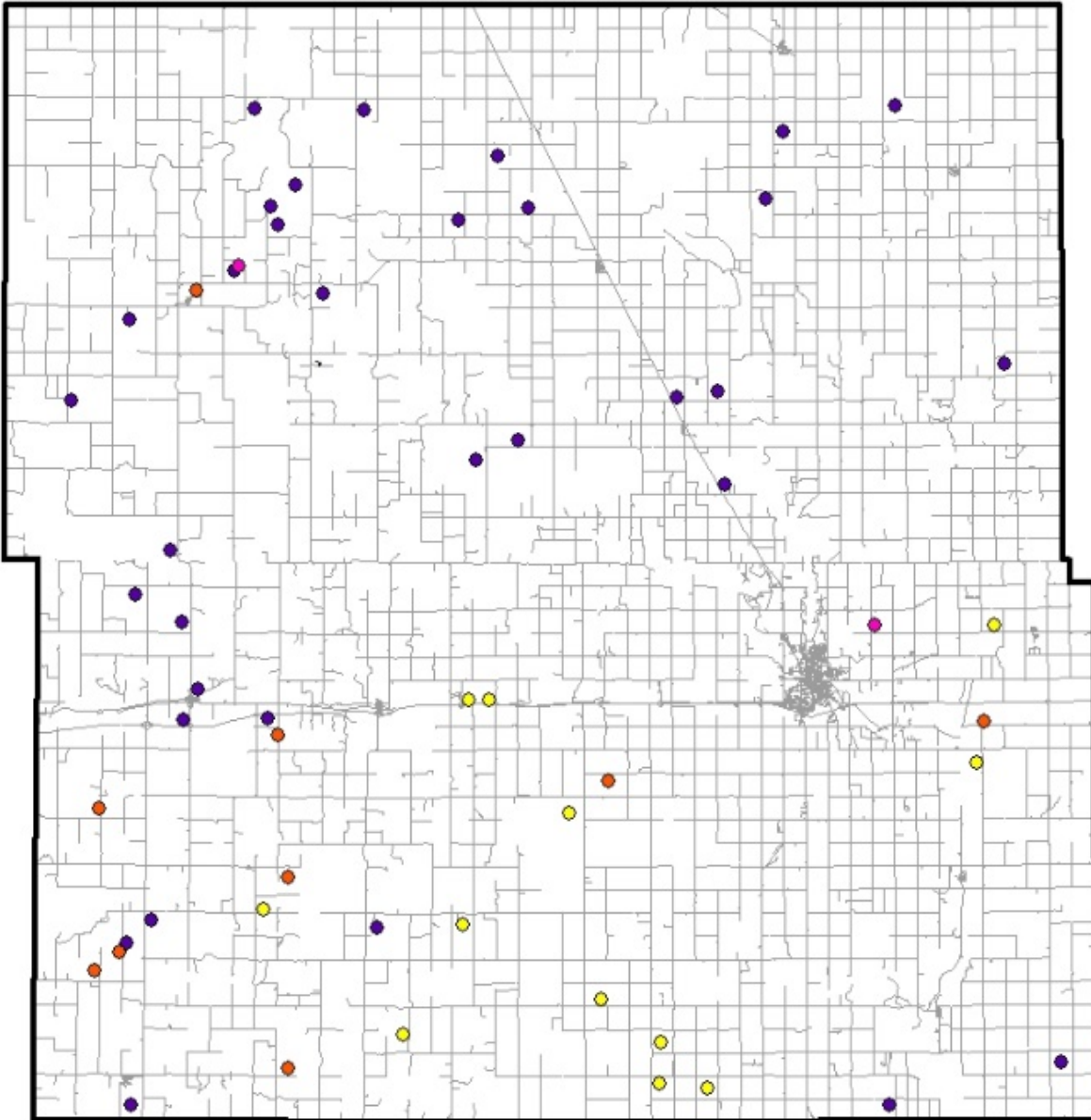


Figure 4. Completed Manure Management Projects from Stutsman County Projects:

Pink – Full Ag Waste Systems

Yellow – Partial Manure Management systems through the Beaver Creek/Seven Mile Coulee Project

Orange – Partial Manure Management systems through the Outdoor Heritage Fund

Purple – Partial Manure Management systems through Phase I Stutsman Manure Management Project

The worksheet can be cleared of all entries except today's date by holding down the "Ctrl" key while pressing the small "c" key. Enter the landowner, location, and planner's name in the first three yellow boxes. Today's date is automatically displayed but may be changed if desired. Once changed the program will no longer display today's date. Then enter the weather station that is closest to the site being evaluated. The precipitation at that site will automatically be entered in the green box below. Enter the hydrologic unit code (HUC) for the location of the lot being evaluated. Note the little red triangles in the corners of some of the cells. Slide the mouse pointer over the top of the cells and additional information or instructions will be displayed.

The spreadsheet allows two feedlots to be evaluated. A before and after project evaluation should be made. Enter a general description of the lot being evaluated. Then enter the size of the lot in square feet and the type of surface on the lot. Next enter the type of animal in the lot, average weight of the animals, and the number of days the animals are confined. If more than one animal type is confined list the type of animal that makes up the majority of the animals. Information about the number of square feet per animal will be automatically calculated. Click on the gray tab titled, "Space Requirements" for recommendations on the desired number of square feet per animal.

Feedlot Features, and Index and Risk Level

Using the point values obtained from Table 1, Feedlot Features, or the information in the red triangles, enter the number of points for each given feature (Containment, Distance, etc.). The computer will automatically calculate the index points and risk level for the described conditions. The spreadsheet must be used to document both the before and after project conditions for each feedlot evaluated.

Manure Management and Conservation Practices

Enter the frequency of hauling or scraping. The frequency of scraping should be entered only if all manure is scraped into a bunker or other structure where the manure will be contained during a 25-year, 24-hour storm. Lastly, enter the conservation practices that will be installed on the lot. A list of potential practices is given at the bottom of the worksheet page.

Loading Calculations

The computer will automatically calculate loading values. The total tons of manure is calculated first, then the amount of nitrogen, phosphorus, and BOD₅ after typical storage losses is calculated. N, P, and BOD₅ availability is also reduced based on the frequency of hauling or scraping. Total loading values are determined by multiplying the amount of the nutrient available by the listed precipitation, lot, and risk factors. Generally, the greater the precipitation the higher the factor. The harder the cover is on the lot the greater the likelihood of runoff and the higher the factor. The higher the risk factor, as entered in the feedlot features, the higher the factor.

Interpretation:

An interpretation table (vulnerability table) can be found by clicking on the tab at the bottom of the screen labeled "Interpretation". This table explains the ratings displayed in the row labeled "risk level".

To obtain additional information or help on the use of the Utah Animal Feedlot Runoff Risk Index, (UAFRRRI) contact your nearest NRCS Area Agronomist or Kerry Goodrich at (801) 524-4568.

***North Dakota Animal Feedlot Runoff Risk Index Worksheet**

Landowner:	Archie Wolf	Weather Station:	Mott
Location:	Hettinger Co.	HUC:	10130202
Planner:		Precipitation:	16.55
Date:	December 7, 2011		

Lot Description:				
Planning Scenario:	Before	After	Before	After
Lot Size (Sq. Ft.):	148104	148104		
Surface Type:	Dirt	Dirt		
Animal Type:	Beef (Feeder)	Beef (Feeder)		
No. of Animals:	600	600		
Avg. Weight:	900	900		
Days Confined:	180	180		
Sq.Ft./Animal:	246.8	246.8		
Feedlot Features				
Runoff Containment	40	0		
Distance to Water	2	2		
% Slope	1.5	1.5		
Vegetation	1	1		
Clean H₂O Diversion	4	0		
Index and Risk Level				
Index:	48.5	4.5		
Risk Level:	Medium	Very Low		
Manure Management and Conservation Practices				
Haul/Scrape Frequency	Annually	Annually		
Practices to be implemented				
Loading Calculations				
Fresh Manure (tons)	2,863	2,863		
Total N Available (lbs)	16,573	16,573		
Total P Available (lbs)	7,964	7,964		
Total BOD₅ Available (lbs)	72,706	72,706		
Precipitation Factor	0.84	0.84		
Lot Surface Factor	0.90	0.90		
Risk Factor	0.40	0.00		
Total N Loading (lbs)	4,990	0		
Total P Loading (lbs)	2,398	0		
Total BOD₅ Loading (lbs)	21,890	0		

*Modified from Utah to fit North Dakota. Individual high risk features should be evaluated and conservation practices applied where possible. All runoff from a 25-year, 24-hour storm event must be contained on the lot.

Practices that might be implemented:

Move Lot	Install Dike	Install Filter Strip
Regrade Lot	Install Diversion	Roof Runoff System
Build Storage	Increase Sq.Ft./Animal	Change Hauling Frequency
Increase Storage		

(UAFRRI) 1.4, Excel Spreadsheet)

January, 2004
USDA-NRCS, UT

Figure 6: Example of Animal Feedlot Runoff Risk Index Worksheet (AFRRIW)

Figure 7

Milestone table for Stutsman Manure Management Watershed Project for Objectives 1,2,3

TASK / RESPONSIBLE ORGANIZATIONS	OUTPUT	Qty	2017	2018	2019	2020	2021
			07/17 06/18	07/18 06/19	07/19 06/20	07/20 06/21	07/21 06/22
Task 1 – Install 2 livestock manure management systems. Group 1,2,3	Manure systems	2					
Task 2 – Install 8 partial livestock manure management systems. Group 1,2,3	Manure systems	8					
Task 3 – Follow-up contacts and monitor O&M agreements. Group 1,2,3,4	Updates	10					
Task 4 – Conduct I/E events on livestock manure management with other agencies. Group 2,3	Tours	4					
Task 5 – Educate land users, media and the public on water quality and livestock manure management Group 3,4	News-letters/ mailings	15					
Task 6 – Complete the annual/final project reports and provide them to the necessary agencies and all other interested parties Group 3	Completed annual reports	5					
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 Health	database	1					

Group 1 – Natural Resources Conservation Service or similar partners (i.e. NDSU Extension, etc.) - Provide technical assistance to plan, design, and implement BMP's.

Group 2 – Livestock Producers in Stutsman County – Make land management decisions and provide cash and in-kind match for BMP's.

Group 3 – Stutsman County Soil Conservation District – Local project manager and sponsor, including responsibilities for project coordination.

Group 4 – ND Department of Health – Statewide Section 319 program management including oversight of local 319 planning and expenditures.