Goose Creek – 09020109

8-Digit Hydrologic Unit Profile

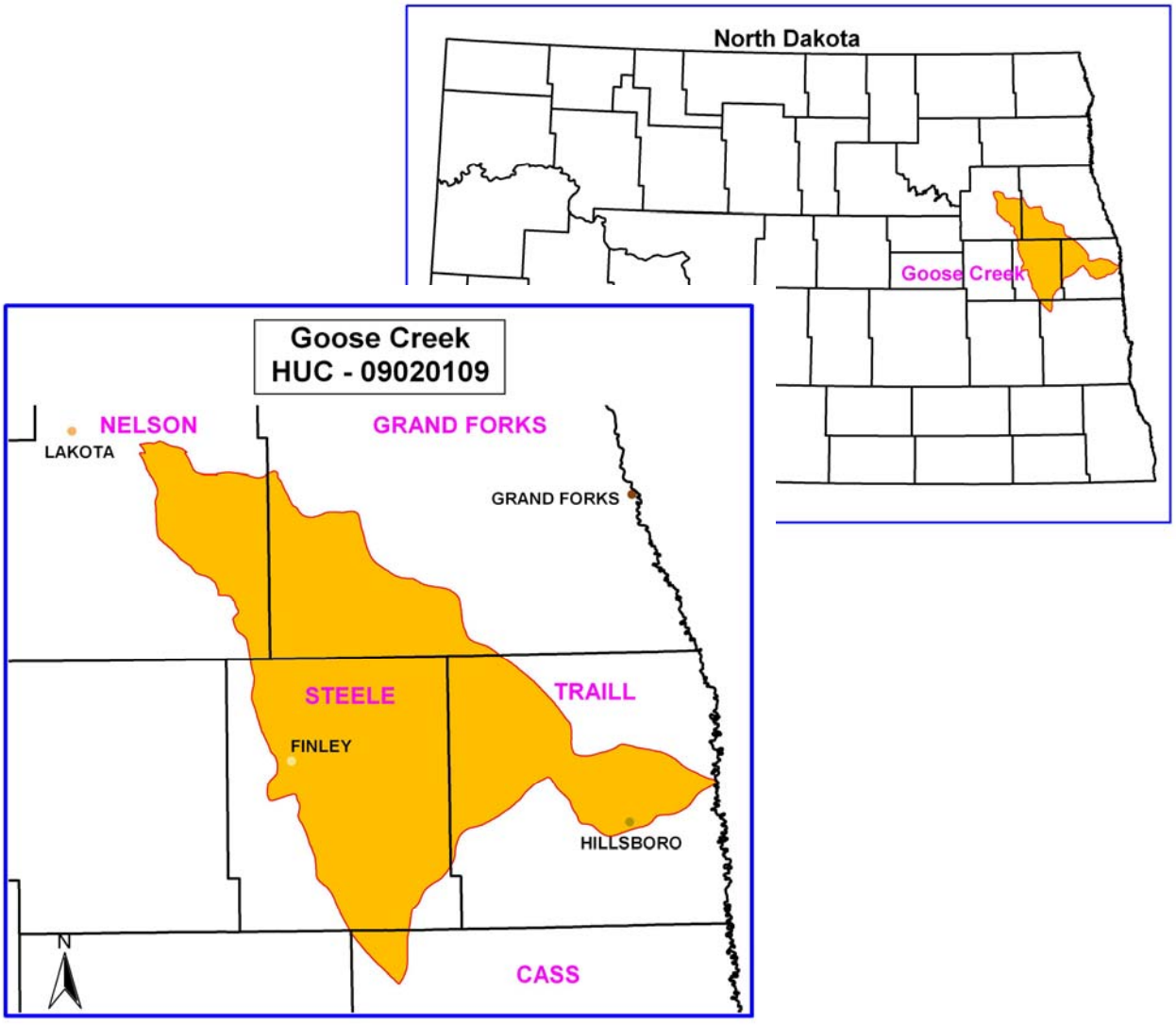
Revised May 2006

Introduction

The Goose Creek 8-Digit Hydrologic Unit Code (HUC) (09020109) sub-basin is approximately 806,900 acres covering parts of five counties (Cass, Grand Forks, Nelson, Steele, and Traill) in the Red River of the North Basin. Of the 806,900 acres, Cass County contains 2%, Grand Forks has 20%, Nelson has 13%, Steele County has 41%, and Traill has 24%.

This sub-basin encompasses commodities ranging from sugar beets, corn and soybeans, and multiple small grain crops to beef cattle and swine.

Conservation assistance is provided by five NRCS service centers and two Resource Conservation & Development offices.



Produced by the Natural Resources Planning Staff Bismarck, ND

Physical Description

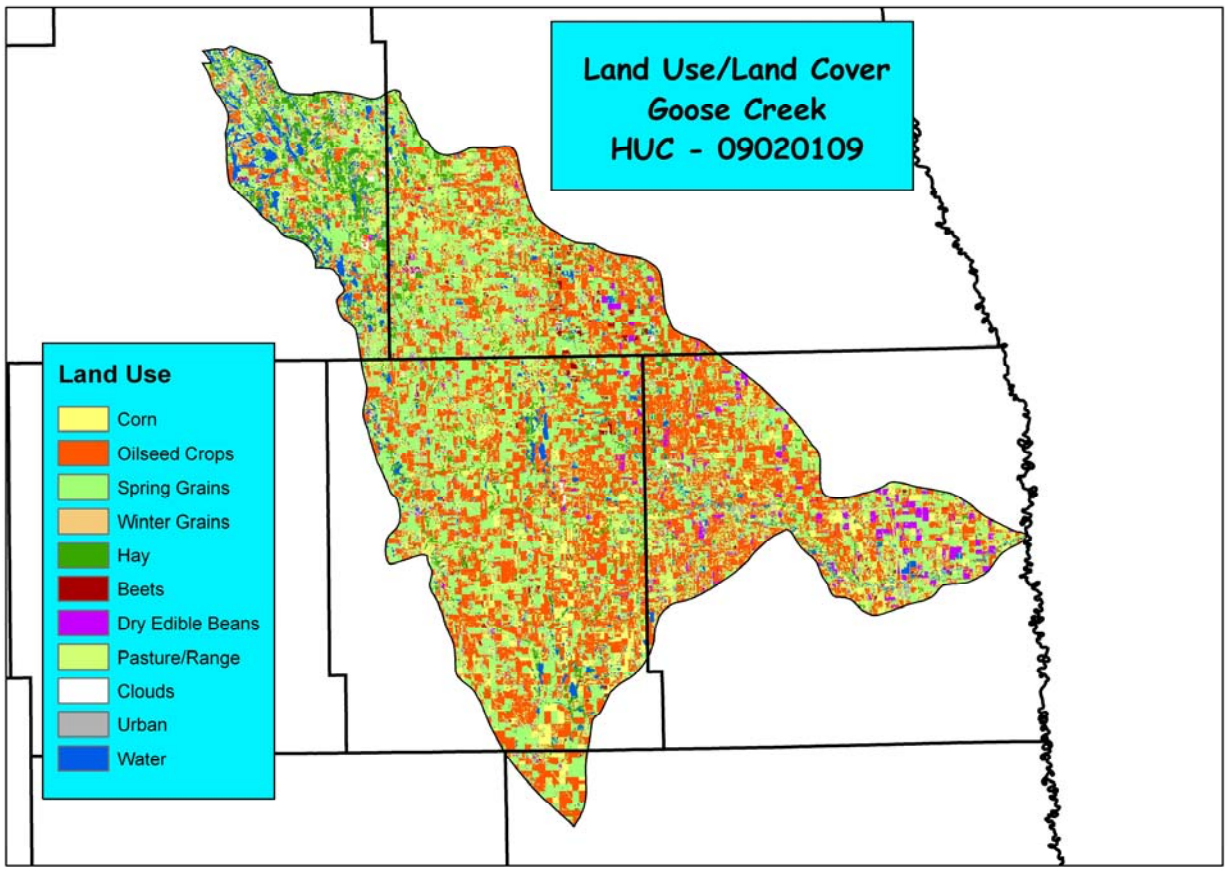
The following table and map show land cover / land use within the sub-basin.

Land Cover / Land Use *(National Resources Inventory [NRI])*[1]	Acres	Percent of HUC
Forestland	8,000	1%*
Cropland	621,900	77%
Conservation Reserve Program (CRP) Land [2a]	19,100	2%
Tame Grass/Hayland	3,700	1%*
Pasture	27,400	3%
Rangeland	22,800	3%
Urban/Farmstead/ Transportation Land	39,900	12%
Water/Wetlands	3,900	1%*
Federal Lands	2,800	1%*
North Dakota HUC Totals [b]	806,900	100%*

** Less than one percent of total acres. See below for special considerations.*
*** Minor land includes farmsteads, windbreaks, marshland, etc.*
a: Estimate from Farm Service Agency records and include CRP/CREP.
b: Totals may not add due to rounding and small unknown acreages.

Irrigated Land *(ND State Water Commision Estimates)*	2,000	<1%

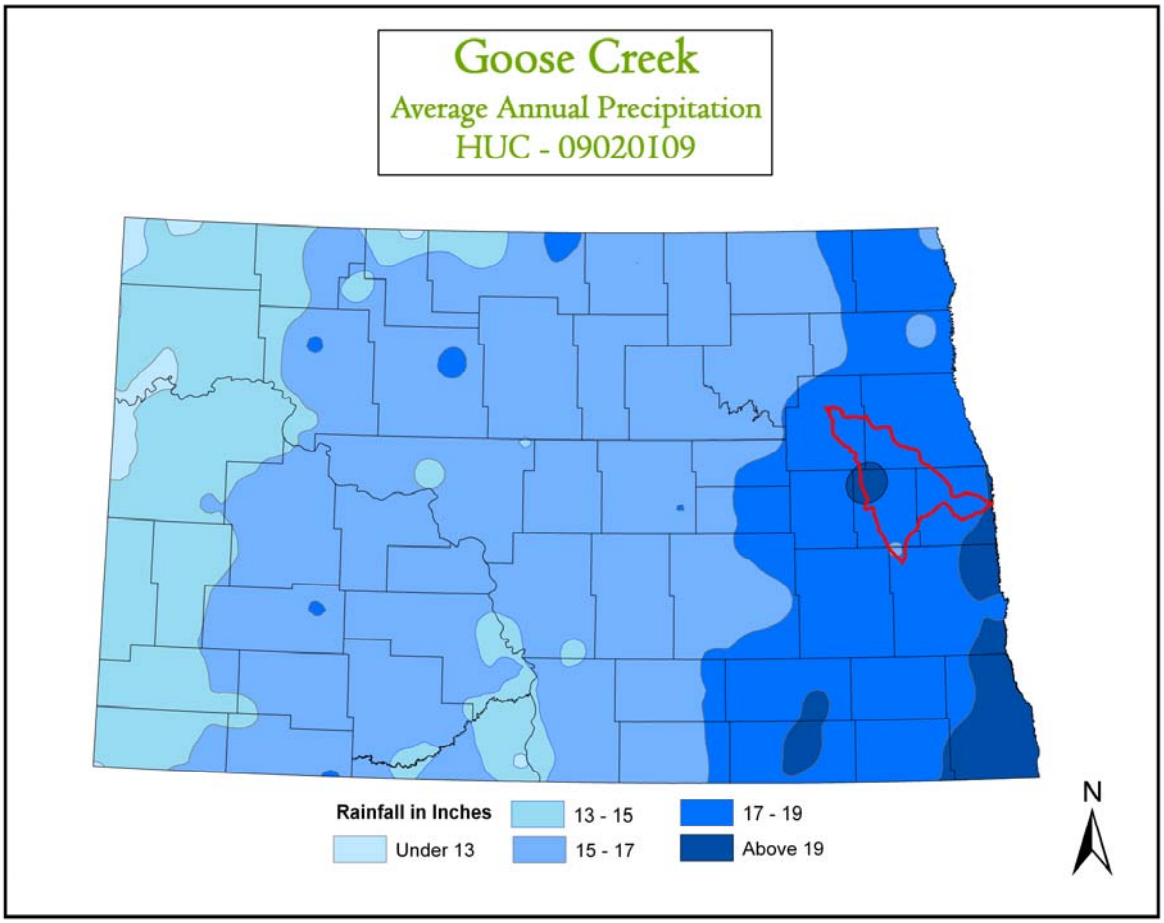
Physical Description – Continued



The above map was developed from U.S. Geologic Survey's (USGS) ND Gap Analysis Program data.[3]

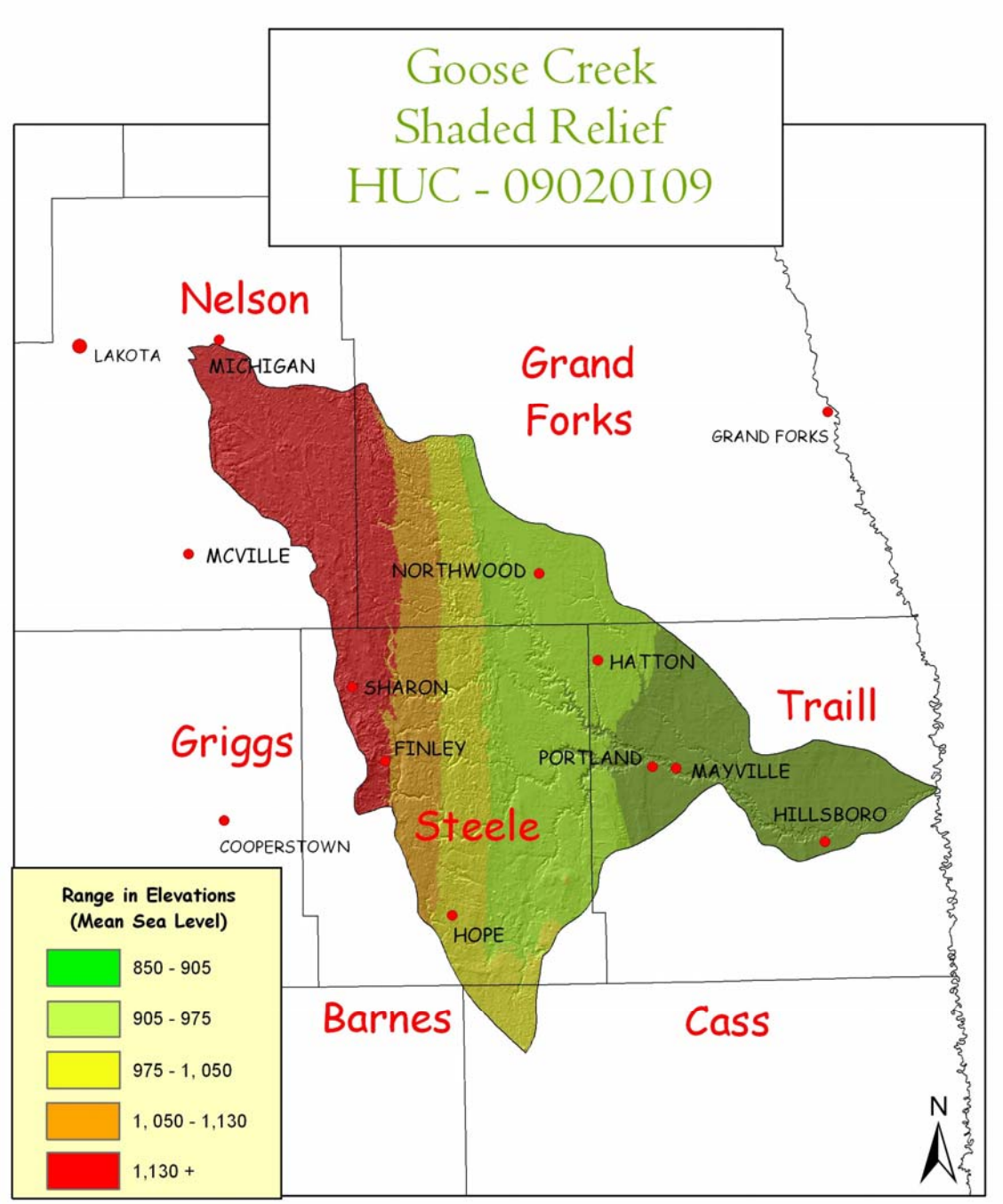
Physical Description – Continued

The following map is a plot of 1961-1990 annual average precipitation contours from National Oceanic and Atmospheric Administration (NOAA) Cooperative stations and (where appropriate) USDA-NRCS Snowpack Telemetry (SNOTEL) Stations. Christopher Daly used the PRISM (**P**arameter-elevation **R**egressions on **I**ndependent **S**lopes **M**odel) model to generate the gridded estimates from which this map was derived: the modeled grid was approximately 4x4 km latitude/longitude, and was resampled to 2x2 km using a Gaussian filter. Mapping was performed by Jenny Weisberg and Nathaniel DeYoung. Funding was provided by USDA-NRCS National Water and Climate Center. (4/20/98)



Physical Description – Continued

The sub-basin is part of the Souris-Red-Rainy River Region - Red River Sub-Region. All drainage patterns flow to the east ending at the Red River, which flows north into Canada. The following map shows the relief for the sub-basin.[4]



Physical Description – Continued

The North Dakota Department of Health collects water quality data on major water bodies. The following table shows the total miles of streams and acres of lakes/reservoirs within the sub-basin and also the miles and acres that have a water quality limitation. The second part of the table shows the livestock numbers, feeding operations, and permitted operations. Also included is the livestock numbers for all cattle, beef cows, dairy cows, hogs and pigs, and sheep and lambs. The livestock numbers were extrapolated from 2002 Agricultural Census county data to 8-digit HUC's.

		Units	North Dakota [5]	Goose Creek Sub-basin [6]	Goose Creek as percent of North Dakota	Impaired Water Quality (303d) [7]	Percent Impaired* Goose Creek
Water Quality Data **Percent of Total Miles and acres in HUC*	Total – Major Water bodies						
	Rivers/Streams	Miles	56,687	1,416	2.5%	150	10.6%
	Lakes/Reservoirs	Acres	434,658	876	0.2%	324	37.0

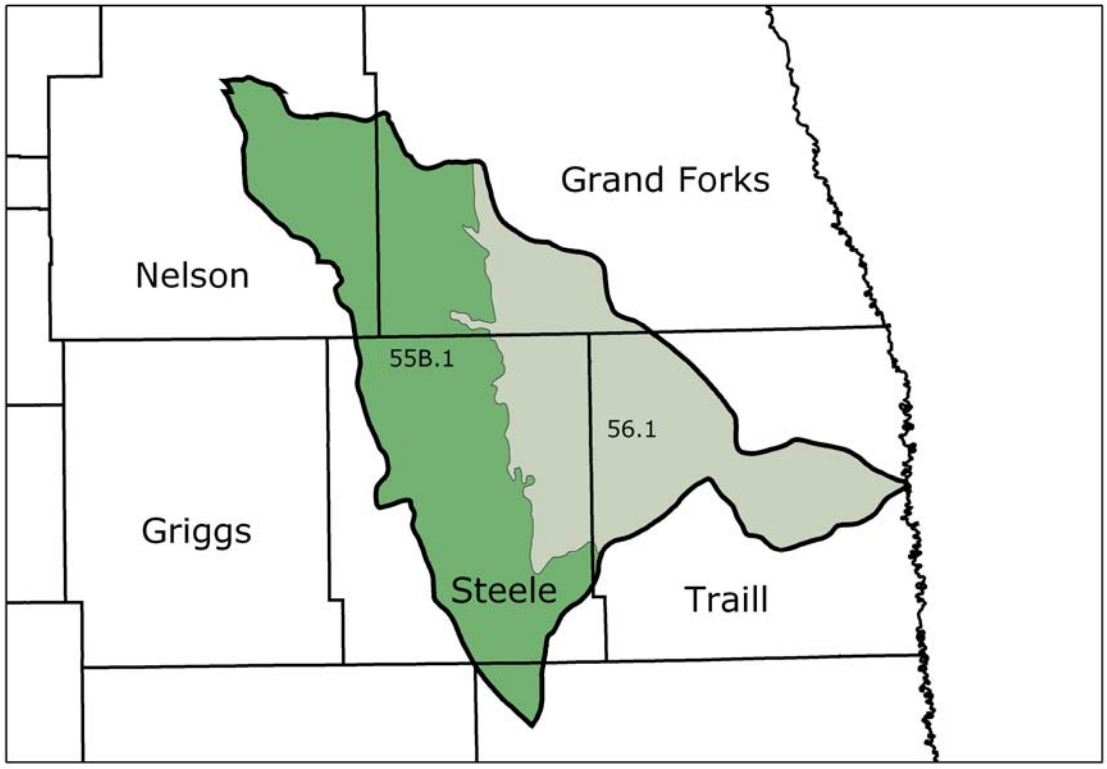
Animal Feeding Facilities – North Dakota Department of Health Permit [8]					
Animal Type	**Dairy**	**Beef**	**Swine**	**Other**	**Total**
Number of Animal Feeding Operations	0	1	1	0	2
Number of Animals	0	6,500	100	0	6,600
Number of State Permitted Operations					2

Livestock Numbers (rounded to nearest 100) [9]					
	Cattle and Calves	Beef Cows	Dairy Cows	Hogs and Pigs	Sheep and Lambs
North Dakota	1,873,200	982,300	34,500	138,800	114,000
Goose Creek	10,800	6,900	100	1,400	1,900
Goose Creek as a percent of North Dakota	0.6%	0.7%	0.3%	1.0%	1.7%

Physical Description – Continued

Common Resource Areas (CRA's) are geographical areas where resource concerns, problems, or treatments are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information were used to determine the geographic boundaries. CRA's are subsets of Major Land Resource Areas. The following map[10] shows the CRA's for Goose Creek sub-basin with the descriptions below.

Common Resource Area (CRA) Map
Goose Creek
09020109

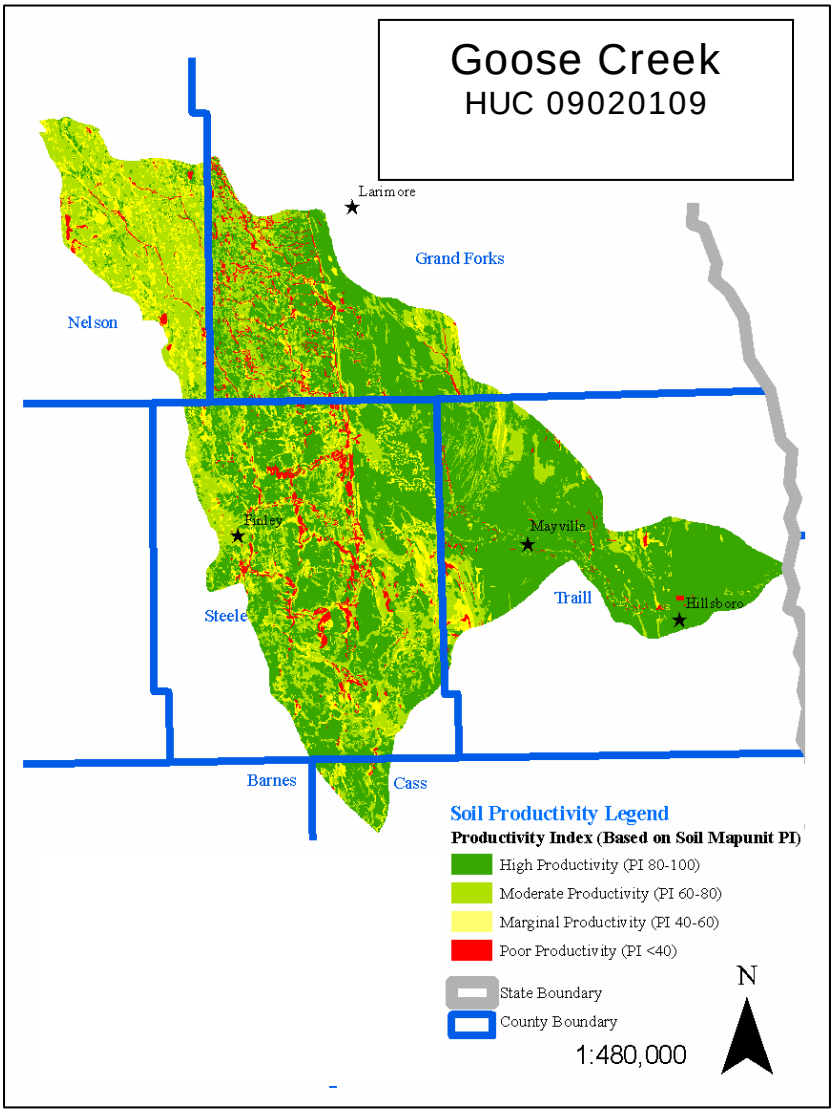


55B.1 – Central Black Glaciated Drift Plain: The Central Black Glaciated Drift Plains are a gently rolling to undulating landscape with a thick layer of glacial till. Temporary and seasonal wetlands are numerous throughout the area. These soils are very fertile, but agricultural success is subject to annual climatic fluctuations. Most of the soils are deep, well drained and moderately well drained, sandy to clayey and have a frigid temperature regime.

56.1 – Red River Valley: The Red River Valley (Glaciated Lake Agassiz) is an extremely flat landscape composed of thick lacustrine sediments. Soils range from silty to clayey in texture. Most soils have a high water table and are very productive. Saline soils exist in places. Most areas are farmed with main crops being small grain, sugar beets, and soybeans. The native vegetation was tall grass prairie. Primary resource concerns are soil erosion and deposition by wind.

Soil Productivity [11]

The Goose Creek sub-basin is divided in productivity by the poor to moderately productive soils of Glacial Lake Agassiz beaches. The soils to the west of the beaches are glacial drift and are marginal to high in productivity, while the soils to the east of the beaches are the highly productive soils of Glacial Lake Agassiz.



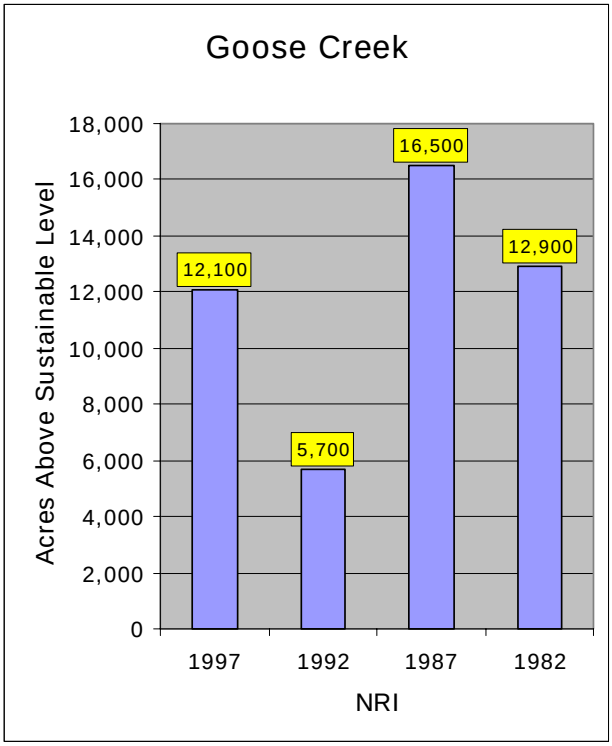
Common Land Unit

The entire sub-basin has the common land unit digitized by Farm Services Agency (FSA).

Resource Concerns

One of the goals of the Natural Resource Conservation Service is to look at an area to help quantify the types and amounts of resources that may be of concern. This helps in identifying priority areas for the types and amounts of assistance to be given to a particular watershed.

❖The acres of land above sustainable levels have demonstrated wide fluctuations in acreage from 1982 to 1997. One possible reason for this may be the extensive row crop production in this sub-basin.



❖ NRI estimates indicate 3,600 acres of the sub-basin agricultural lands still had water erosion rates above a sustainable level in 1997.

❖ It estimates show 8,500 acres of the sub-basin agricultural lands still had wind erosion rates above a sustainable level in 1997.

❖ Controlling erosion not only sustains the long-term productivity of the land, but also affects the amount of soil, pesticides, fertilizer, and other organic material that move into the basin's waters.

❖ Through NRCS programs, many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. As a result, water erosion rates on cultivated cropland were 1.34 tons/acre/year in 1997.

❖ NRI estimates indicate 16,000 acres of Highly Erodible Land (HEL) in 1997 compared to 20,100 acres in 1987. This is a 20% reduction in HEL being farmed.

❖ Fifty percent of all 303(d) listed stream, lake and reservoir acres are listed for sedimentation /siltation. Impairments from Total fecal coliform, nutrients/eutrophication and biological indicators were also listed. Stream reaches listed for sediment are affected by erosion on croplands and from stream banks. Lack of riparian buffers in cropland fields contribute to the stream bank erosion.

❖ Conservation practices that can be used to address these water quality issues include erosion control, nutrient and pest management, grazing management, agricultural waste management/utilization and riparian buffers.

Resource Concerns – Continued

The following table shows the different projects, plans, studies, and assessments and their status that have been conducted within the sub-basin.

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		**NRCS Watershed Plans, Studies & Assessments**	
Name	**Status**	**Name**	**Status**
None	NA	None	NA
NDDH TMDLs		**Soil Conservation District Assessments and Studies**	
Number Listed		**Name**	**Status**
Lakes/Reservoirs - 1	Streams – 5	Goose River Water Quality Assessment – Steele Co.	Ongoing
EPA 319 Watershed Projects			
Name		**Status**	
None		NA	

Soil

- Sandy soils and irrigated soils still require conservation practices to control excessive soil erosion.
- Windbreak plantings, reduced tillage systems, and improved cropping systems are still needed.
- Soil health, especially compaction on heavier or fine textures soils and organic matter on sandy soils are two resource concerns.

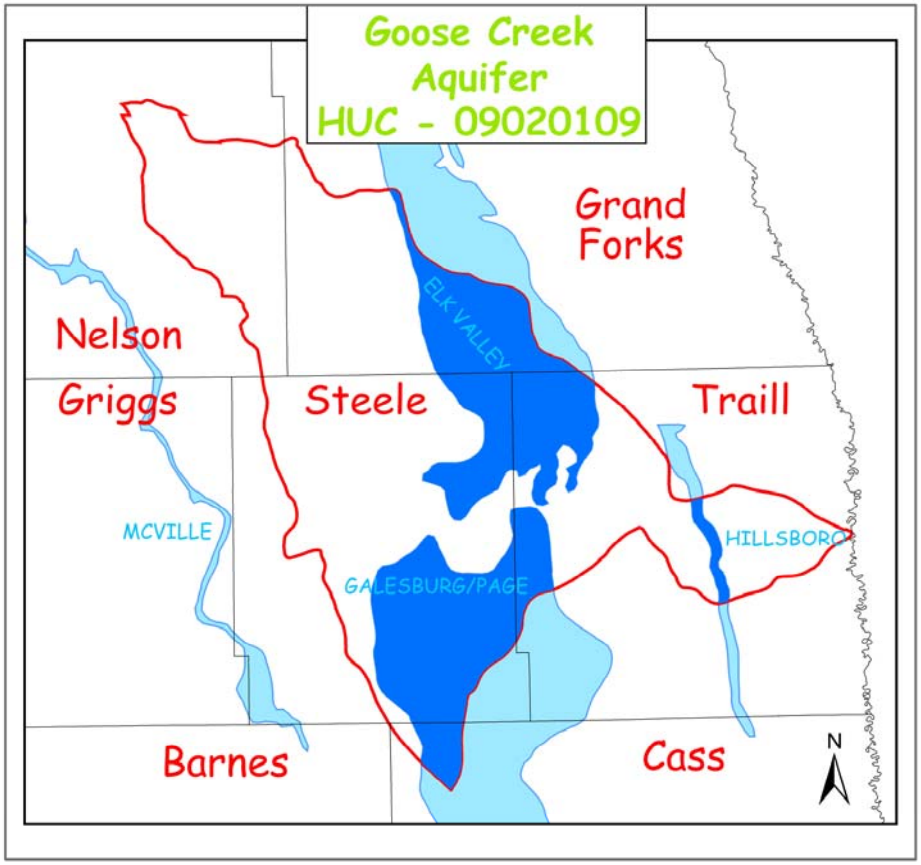
Water

- Total fecal coliform, sediment and nutrients are primary water quality pollutants impairing the watershed streams and lakes.
- The Goose Creek has water quality impacts from sedimentation and siltation, along with nutrient loading and Total Fecal Coliform.
- Lack of adequate riparian buffer width and health are impacting water quality and stream health
- Flooding does occasionally occur and impact crop production.
- Water conservation and water quality (potential for pesticide contamination) are issues on irrigated cropland.

Resource Concerns – Continued

Water (cont.)

- **Aquifers**[12] - There are three glacial drift aquifers (Galesburg/Page, Hillsboro, and Elk Valley) located below the Goose Creek sub-basin. The Galesburg/Page and Hillsboro aquifers are the source of water for the Traill County Rural Water Users, and the cities of Hillsboro, Galesburg and Page.



Air

- Nearby factories expel odors that are very noticeable.
- Blowing snow is a concern during winter months.

Plants

- Major concerns are with controlling invasive weeds and maintaining good pasture condition.
- Direct seeding of corn and soybeans has been successful in some locations.
- Soil erosion and low organic matter remain resource concerns.
- Conventional tillage systems are still utilized, especially sugar beets.
- Noxious weeds and poor range condition reduce productivity for livestock and wildlife.
- Season long grazing on or near water courses are a concern.
- The private non-industrial forestland is associated with small woodlots or rural home sites which are not actively managed for timber production.

Resource Concerns – Continued

Animals

- Threatened and endangered species can be seen in the table provided below.

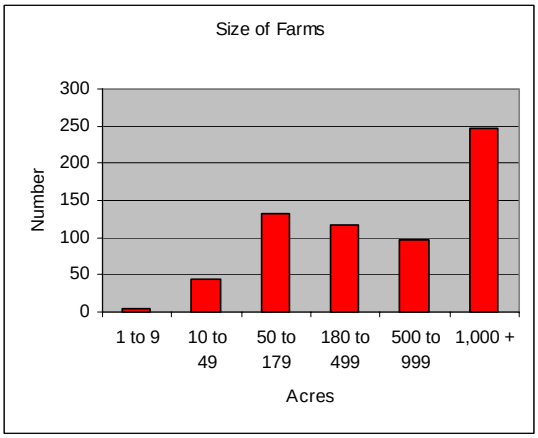
Federally Listed Threatened And Endangered Species			
Species Category	Threatened	Endangered	Candidate
Mammals	None	Gray Wolf	None
Birds	Bald Eagle	None	None
Fish	None	None	None
Invertebrates	None	None	None
Plants	None	None	None
Critical Habitat – None			

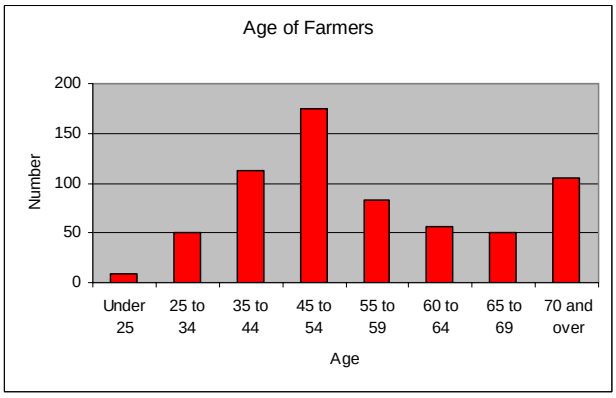
Census and Social Data[13]

Number of Farms: 342

Number of Operators:

- Average Age: 54
- Full-Time Operators: 74%
- Part-Time Operators: 26%





Estimated Level of Willingness and Ability to Participate in Conservation: MODERATE

Limited Resource and Beginning Farmer

Three percent of the operators are minority producers. Limited resource farmers are estimated at 7 percent. These percentages point to the potential need for special technical assistance targeted to reach people who (1) may lack experience with government farm programs, (2) have good stewardship intentions but lack management skills, and (3) lack the time to visit an NRCS field office and seek assistance.

References

[1] USDA-NRCS, NRI data.
[2] USDA-Farm Services Agency, Common Land Unit GIS data layer, 2005.
[3] USDI-US Geologic Services, ND GAP analysis data, 2005.
[4] USDA-NRCS, Natural Resources Planning Staff, 30 meter Relief Data GIS data layer, 2002.
[5] ND Department of Health, Environmental Health Section, Water Quality Division, National Hydrography GIS layers, June 2006.
[6] ND Department of Health, Environmental Health Section, Water Quality Division, National Hydrography GIS layers, June 2006.
[7] ND Department of Health, Environmental Health Section, Water Quality Division, List of Section 303(d) TMDL Waters for the Red River Basin in North Dakota, 2006.
[8] ND Department of Health, Environmental Health Section, Water Quality Division, Animal Feeding Operations Program data, 2006.
[9] 2002 Census of Agriculture, North Dakota, State and County Data Volume 1, Geographic Area Series Part 34, U.S. Department of Agriculture, National Agricultural Statistics Service, June 2004. (county data was prorated to HUC by the percent of a HUC in a county)
[10] USDA-NRCS, Natural Resources Planning Staff, Common Resource Area GIS data layer, 2004.
[11] USDA-NRCS, Natural Resources Planning Staff, Soils Productivity GIS data layer, 2006.
[12] ND Department of Health, Environmental Health Section, Water Quality Division, Ambient Ground Water Monitoring Program data, 1997.
[13] 2002 Census of Agriculture, North Dakota, State and County Data Volume 1, Geographic Area Series Part 34, U.S. Department of Agriculture, National Agricultural Statistics Service, June 2004. (county data was prorated to HUC by the percent of a HUC in a county)