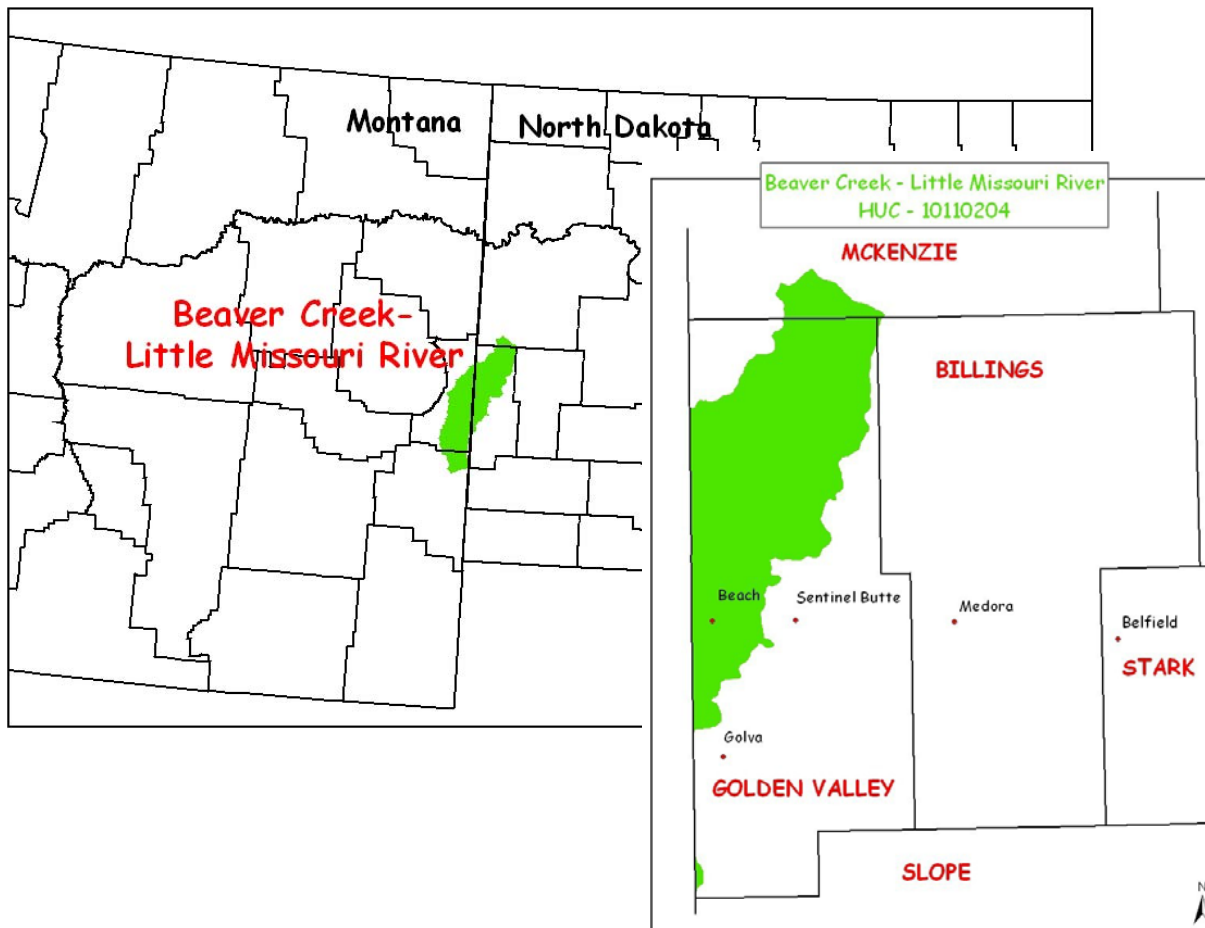


Introduction

The Beaver Creek - Little Missouri River 8-Digit Hydrologic Unit Code (HUC) (10110204) sub-basin includes land in Montana and North Dakota. There are approximately 562,700 acres in the entire sub-basin. This sub-basin is located in Missouri Region, Missouri-Little Missouri Sub-Region.

This Rapid Watershed Assessment (RWA) report addresses the portion of Beaver Creek - Little Missouri River sub-basin located within North Dakota. The sub-basin is approximately 262,500 acres covering parts of 3 counties (Billings, Golden Valley, and McKenzie) in North Dakota. Of the 262,500 acres, Golden Valley County contains 90%, McKenzie 9% and less than 1% in Billings. There are approximately 96 farms in the sub-basin.



This sub-basin encompasses commodities ranging from sunflowers, hay, and multiple small grain crops with significant numbers of beef cattle.

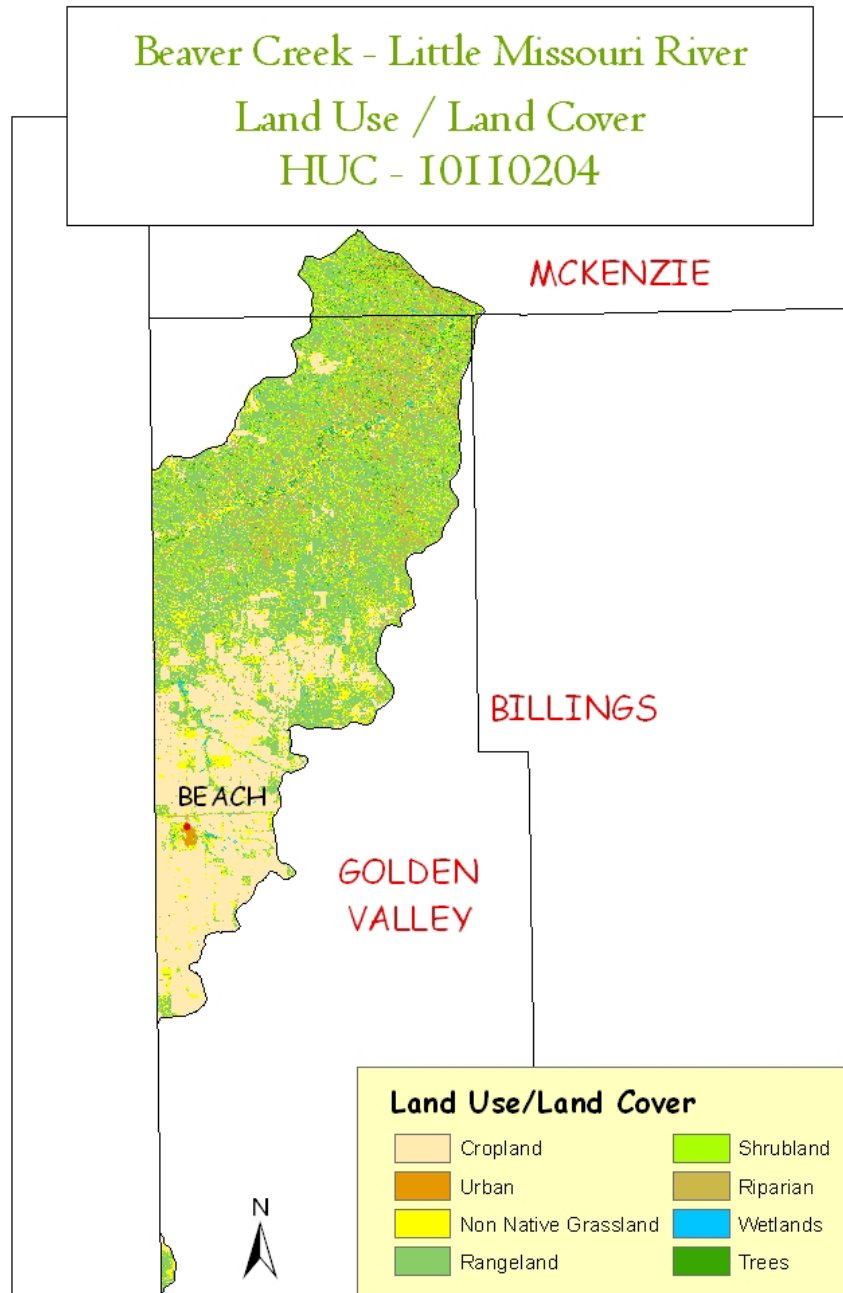
Conservation assistance is provided by two NRCS service centers, one soil survey office, and two Resource Conservation & Development office.

Physical Description

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

Land Cover/ Land Use (<i>National Resources Inventory [NRI]</i>) ¹	Acres	Percent of HUC
Forestland	0	0%
Cropland	55,000	21%
Conservation Reserve Program (CRP) Land ² a	12,100	5%
Tame Grass/Hayland	4,600	2%
Pastureland	4,100	1%
Rangeland	111,200	42%
Urban/Farmstead/ Transportation Land	22,000	8%
Water/Wetlands	500	1% *
Federal Lands	53,500	20%
Minor Lands **	NA	NA
North Dakota HUC Totals ^b	262,500	100% *
<p><i>* 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.</i></p>		
Irrigated Land <i>(Farm Services Agency)</i> ³	0 (NRI)	0%

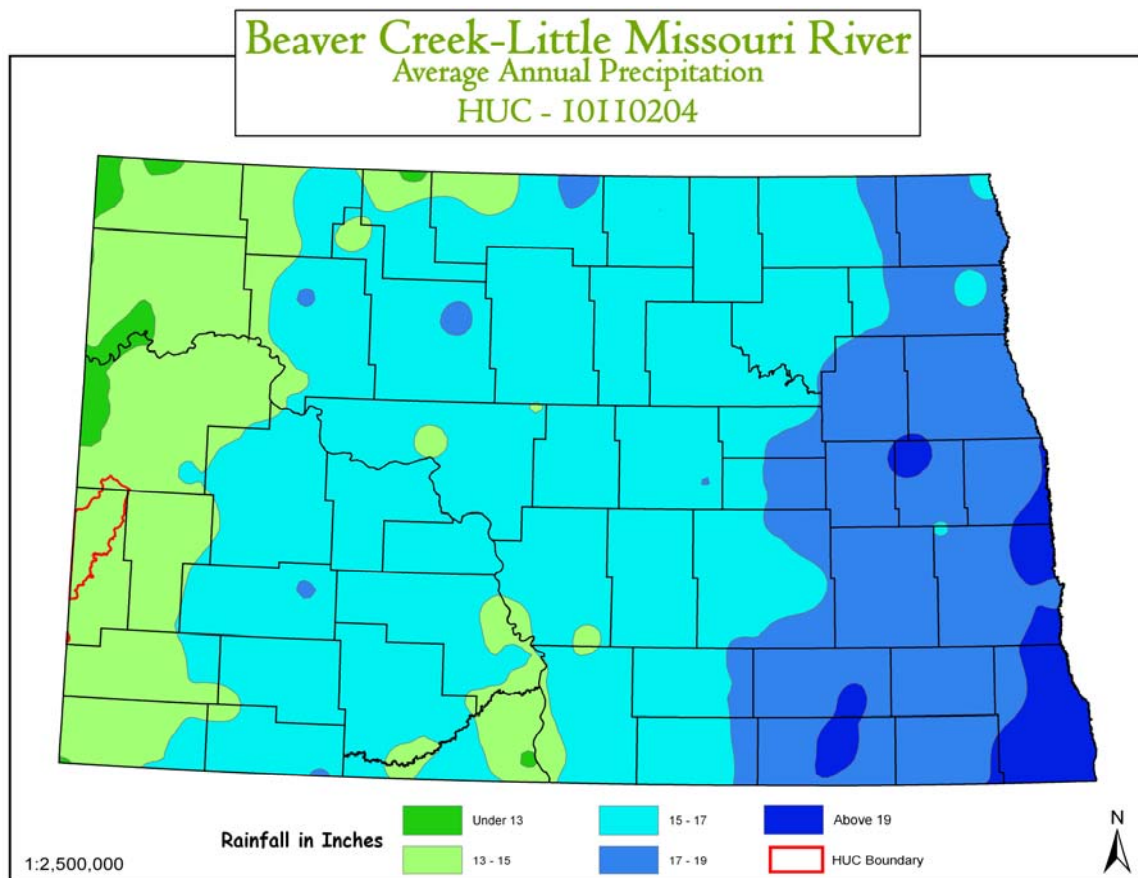
Physical Description – Continued



The above map was developed from U.S. Geologic Survey's (USGS) ND Gap Analysis Program data.⁴

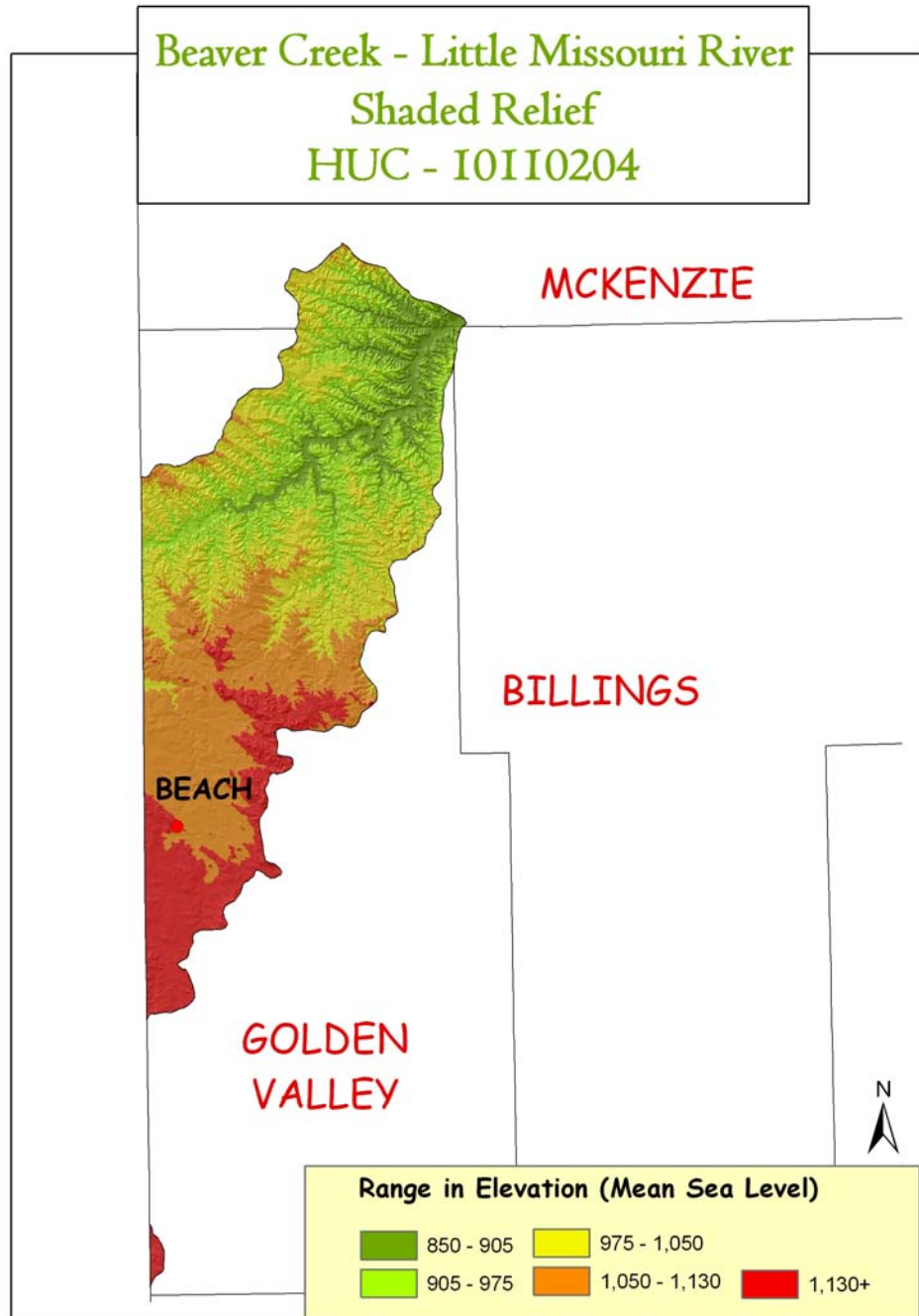
Physical Description – Continued

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 (Parameter-elevation Regressions on Independent Slopes Model) 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 Missouri River Region, Little Missouri River Sub-Region. Drainage patterns flow to the northeast ending up in the Little Missouri River which flows north into Missouri River. The adjacent map shows the relief for the sub-basin.⁵



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 ⁶	Beaver Creek - Little Missouri River Sub-basin ⁷	Beaver Creek - Little Missouri River as percent of North Dakota	Impaired Water Quality (303d) ⁸	Percent Impaired* Beaver Creek - Little Missouri River
Water Quality Data	Total – Major Water bodies						
	Rivers/Streams	Miles	56,687	194	0.3%	None - ID	0%
	Lakes/Reservoirs	Acres	434,658	113	0.03%	None - ID	0%

**Percent of Total Miles and acres in HUC*

Animal Feeding Facilities – North Dakota Department of Health Permit⁹					
Animal Type	Dairy	Beef	Swine	Other	Total
Number of Animal Feeding Operations	0	0	0	0	0
Number of Animals	0	0	0	0	0
Number of State Permitted Operations					0

Livestock Numbers (rounded to nearest 100)¹⁰					
	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
Beaver Creek - Little Missouri River	47,300	21,900	1,500	700	800
Beaver Creek - Little Missouri River as a percent of North Dakota	0.6%	0.4%	0.6%	0.1%	1.3%

Physical Description – Continued

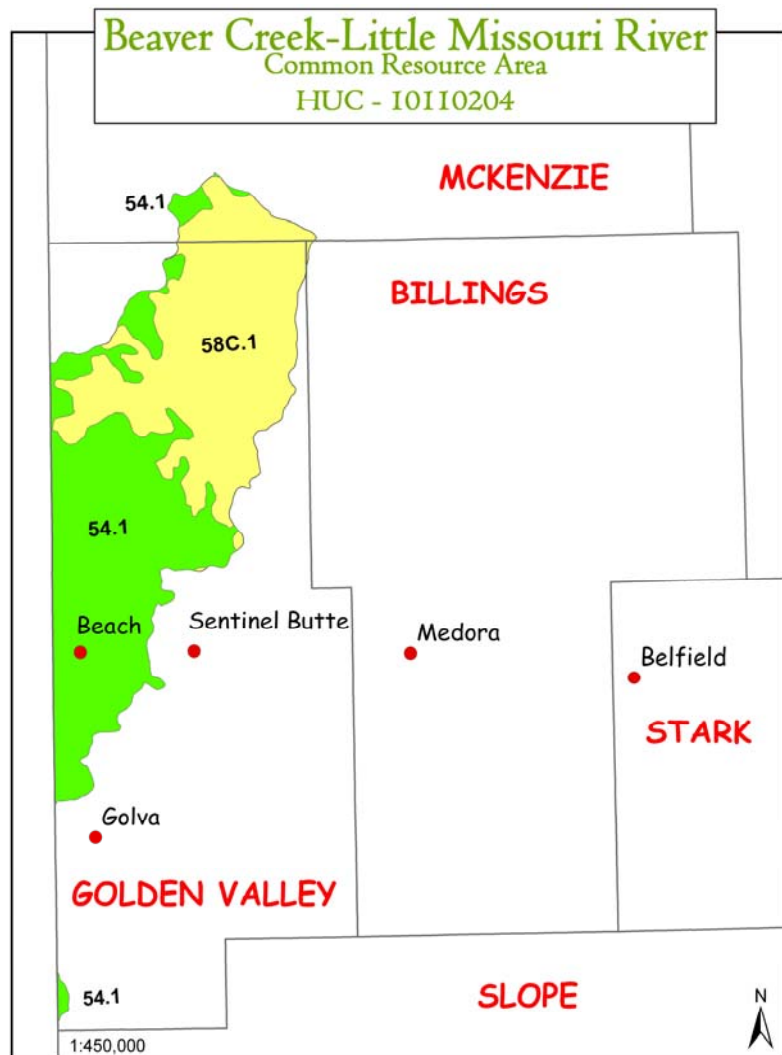
Common Resource Areas (CRAs) are geographical areas where resource concerns, problems, or treatments are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information were used to determine the geographic boundaries. CRAs are subsets of Major Land Resource Areas. The following map¹¹ shows the CRAs for Beaver Creek - Little Missouri River sub-basin with the descriptions below.

54.1 - Rolling Soft Shale Plain:

The Rolling Soft Shale Plain is a semiarid rolling plain with soils formed from shale, siltstone, and sandstone. Native grasses cover areas of steep or broken topography, while cultivated and forage crops dominate other parts of the landscape. Most soils are moderately deep and deep, well drained and moderately well drained, loamy and clayey, and have a frigid temperature regime. The area was largely unaffected by glaciation and retains a moderately dissected stream drainage pattern.

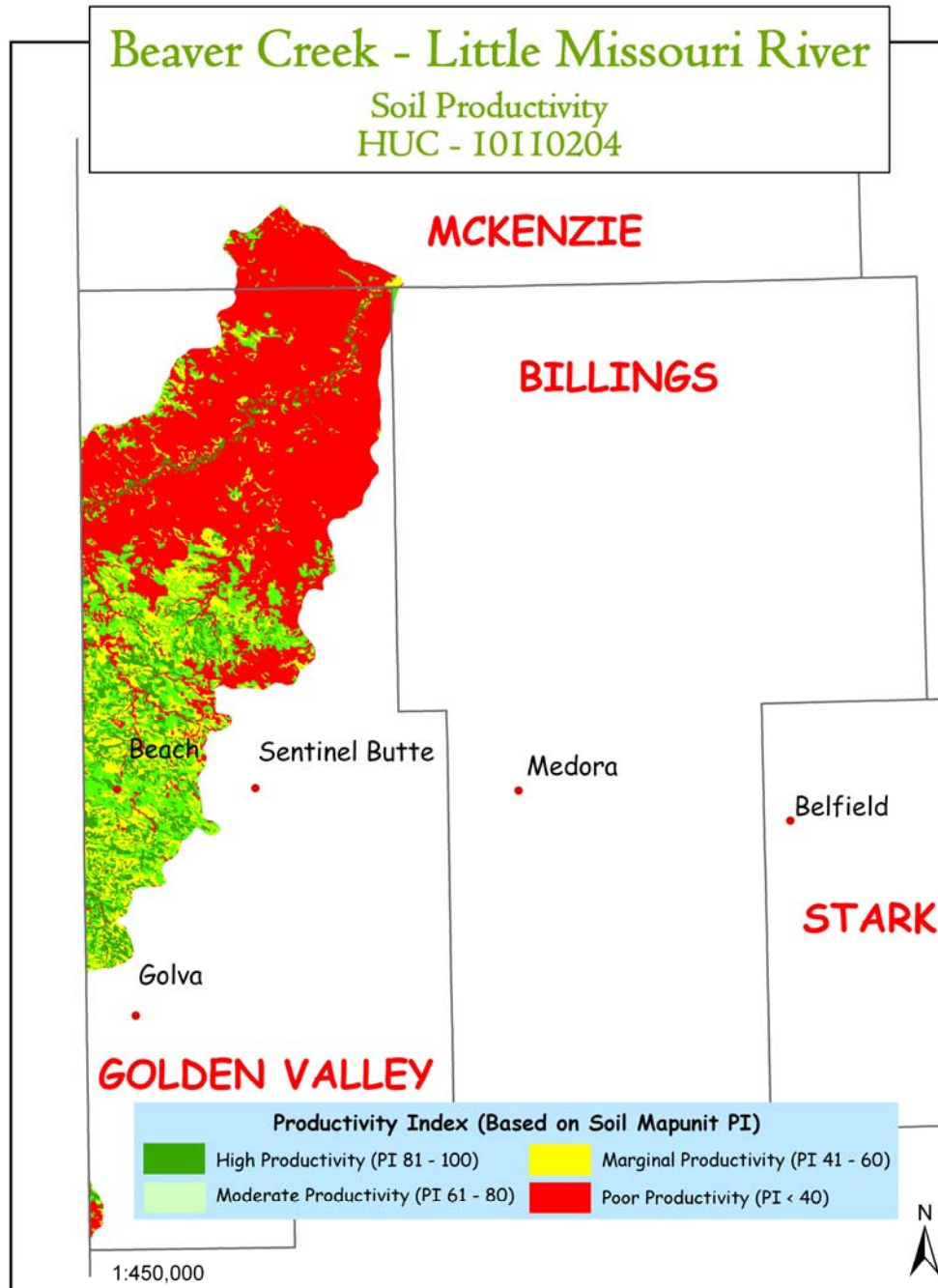
58C.1 - Northern Rolling High Plains, Northeastern Part:

These strongly dissected plains consist mainly of badlands and steep to very steep soils. Soils formed in shale, siltstone, sandstone, or locally thick alluvium. Most vegetated areas are grazed by livestock. Rocky Mountain Juniper, Aspen, and Ponderosa Pine occur on north slopes. Mean annual precipitation is 350 to 400 mm. Mean annual air temperature is 4 to 6°C. Average frost-free period is 110 to 120 days.



Soil Productivity ¹²

The Beaver Creek - Little Missouri River sub-basin has two distinct soil productivity regions. The southwest region within North Dakota consists of marginal to highly productive agricultural cropland. The northern region consists of shallow soils in association with badlands. This land is used mainly for cattle grazing.



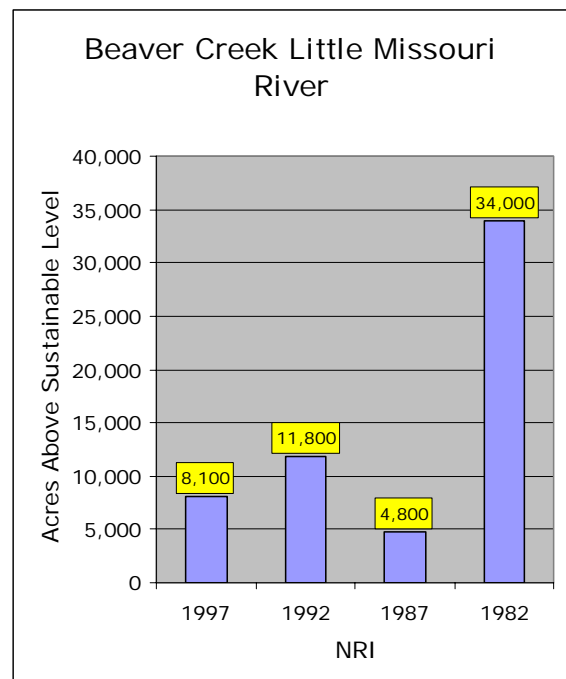
Common Land Unit

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

Resource Concerns

One of the goals of NRCS is to look at an area to help quantify the types and amounts of resources that may be of concern. This helps to identify priority areas for the types and amounts of assistance to be given to a particular watershed.

- ❖ Acres of land experiencing erosion rates above sustainable levels in 1997 have decreased to 8,100 acres, from a high of 34,000 acres in 1982.
- ❖ NRI estimates indicate 5,900 acres of the sub-basin agricultural lands still had water erosion rates above a sustainable level in 1997.
- ❖ Estimates show 2,200 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 Little Missouri River.
- ❖ Through NRCS programs many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. As a result, erosion rates on cultivated cropland were 2.06 tons/acre/year in 1997.



- ❖ NRI estimates indicate 24,600 acres of Highly Erodible Land (HEL) in 1997 compared to 37,000 acres in 1987. This is slightly over a one-third reduction in HEL fields being farmed.
- ❖ Although not on the State's TMDL 303(d) list, Odland Dam Reservoir has symptoms of nutrient enrichment and hyper-eutrophication. The local Water Resource District and Soil Conservation District are looking to target their resources in this sub-watershed.
- ❖ Conservation practices that can be used to address these water quality issues include grazing management, erosion control, nutrient and Ag waste management, 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 - 0	Streams - 0	Little Beaver Creek	Preliminary Scoping meeting with local SCD and WRD Boards
EPA 319 Watershed Projects			
Name		Status	
None		NA	

Soil

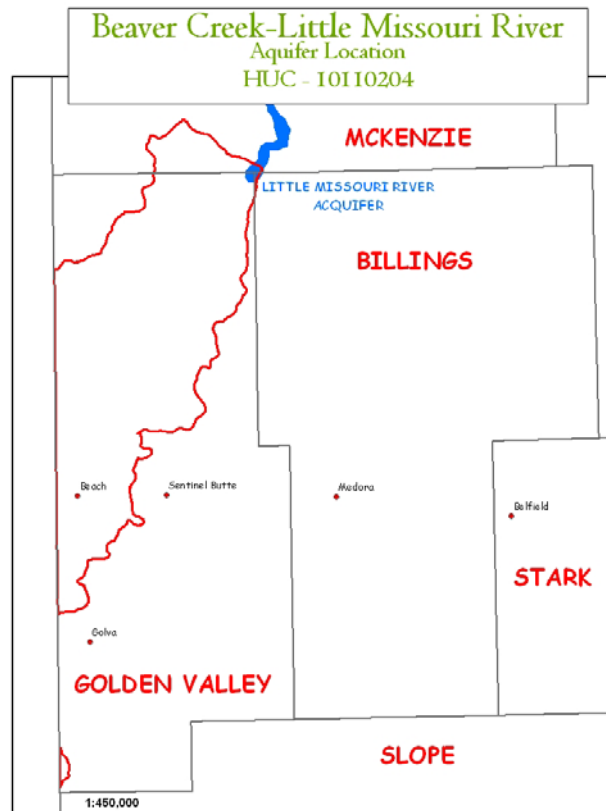
- Sandy soils and steep soils still require reduced tillage systems, and improved cropping systems to control excessive soil erosion.
- Compaction on heavier or fine textured soils and adequate organic matter on sandy soils are two major concerns.

Water

- Agricultural wastes, sediment, and nutrients are primary water quality pollutants impairing the watershed streams and lakes.
- **Aquifers**¹³ - There is a small portion of one aquifer (Little Missouri River) located below the Beaver Creek - Little Missouri River sub-basin.
- **Wellhead Protection Areas**¹⁴ - there are two protection areas located in the sub-basin. They are designated to protect the municipal water supply for the city of Beach and the Home on the Range facility.

Air

- Visibility is reduced during winter months from blowing snow.





Resource Concerns - Continued

Plants

- Controlling invasive weeds and maintaining good pasture condition are major concerns.
- Noxious weeds and poor range condition reduce productivity for livestock and wildlife.
- Direct seeding and annual cropping have been successful with minimum tillage systems.
- U.S. Forest Service has significant acreage within the watershed that is utilized by ranchers.

Animals

- Lack of adequate livestock grazing systems and feedlots are having an affect on the streams.
- Threatened and endangered species are shown in the following threatened and endangered species table.

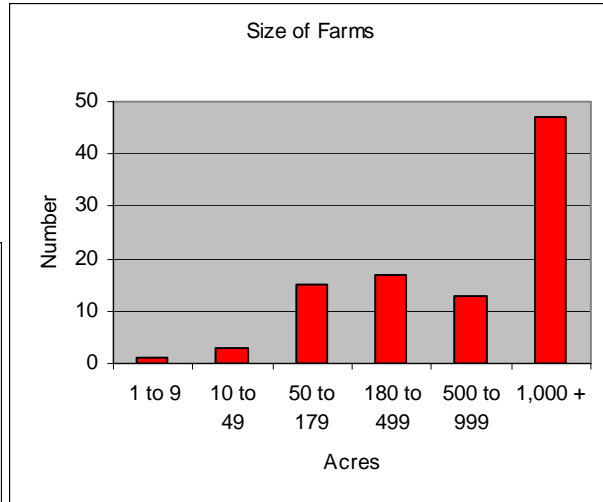
Federally Listed Threatened And Endangered Species			
Species Category	Threatened	Endangered	Candidate
Mammals	None	Black Footed Ferret, Gray Wolf	Black-tailed Prairie Dog
Birds	Bald Eagle, Piping Plover	Whooping Crane, Interior Least Tern	None
Fish	None	None	None
Invertebrates	None	None	Dakota Skipper
Plants	None	None	None
Critical Habitat – None			

Census and Social Data¹⁵

Number of Farms: 96

Number of Operators:

- Average Age: 56
- Full-Time Operators: 74%
- Part-Time Operators: 26%



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

Limited Resource and Beginning Farmer

Seven minority and two limited resource farmers have been identified in this small portion of hydrologic unit 10110204. Because of the very rural nature of this watershed, special technical assistance will need to be targeted to reach people who may not be able to visit an NRCS field office to seek assistance.

All data is provided "as is." There are no warranties, express or implied, including warranty of fitness for a particular purpose, accompanying this document. Use for general planning purposes only.



References

- ¹ USDA-NRCS, NRI data.
- ² USDA-Farm Services Agency, Common Land Unit GIS data layer, 2005.
- ³ USDA-Farm Services Agency, Common Land Unit GIS data layer, 2005.
- ⁴ USDI-US Geologic Services, ND GAP analysis data, 2005.
- ⁵ USDA-NRCS, Natural Resources Planning Staff, 30 meter Relief Data GIS data layer, 2002.
- 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, National Hydrography GIS layers, June 2006.
- ⁸ 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.
- ⁹ ND Department of Health, Environmental Health Section, Water Quality Division, Animal Feeding Operations Program data, 2006.
- ¹⁰ 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)
- ¹¹ USDA-NRCS, Natural Resources Planning Staff, Common Resource Area GIS data layer, 2004.
- ¹² USDA-NRCS, Natural Resources Planning Staff, Soils Productivity GIS data layer, 2004.
- ¹³ ND Department of Health, Environmental Health Section, Water Quality Division, Ambient Ground Water Monitoring Program data, 1997.
- ¹⁴ ND Department of Health, Environmental Health Section, Water Quality Division, Source Water Protection Program data, 2003.
- ¹⁵ 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)