

# Upper Cannonball River 10130204

## *8-Digit Hydrologic Unit Profile*

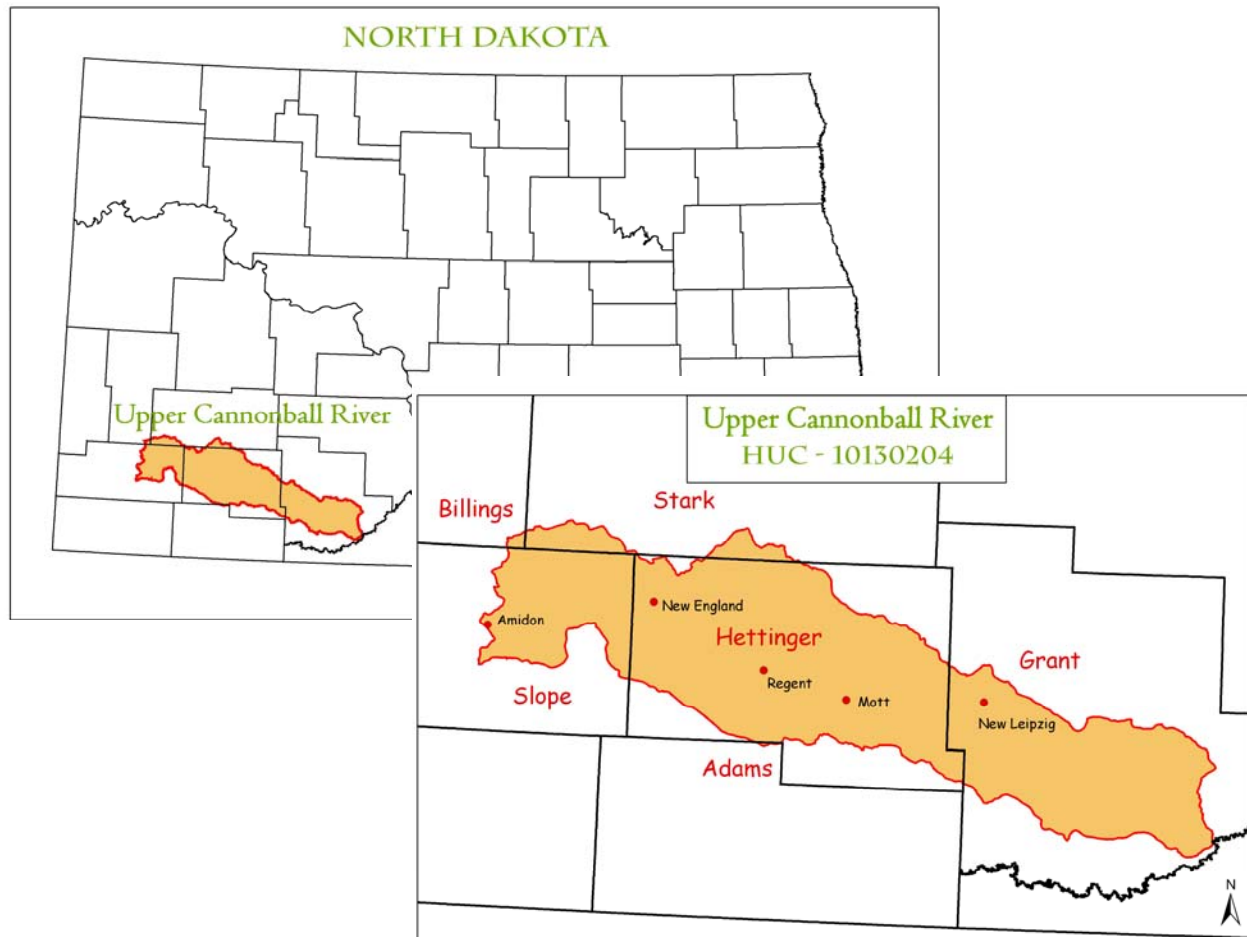
Revised July 2006

### **Introduction**

The Upper Cannonball River 8-Digit Hydrologic Unit Code (HUC) (10130204) sub-basin is approximately 1,006,900 acres covering parts of six counties (Adams, Billings, Grant, Hettinger, Slope, and Stark) in the Missouri River Region – Lake Oahe Sub-Region. Of the 1,006,900 acres, Hettinger County contains 50%, Grant 30%, Slope 15%, Stark 3%, Adams 1%, and Billings has 1%. There are 605 farms in the sub-basin.

This sub-basin encompasses commodities ranging from wheat, alfalfa, sunflowers, and corn to beef cattle and swine.

Conservation assistance is provided by five Natural Resources Conservation Service (NRCS) service centers, one soil survey office, and two Resource Conservation & Development offices.



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### Physical Description

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

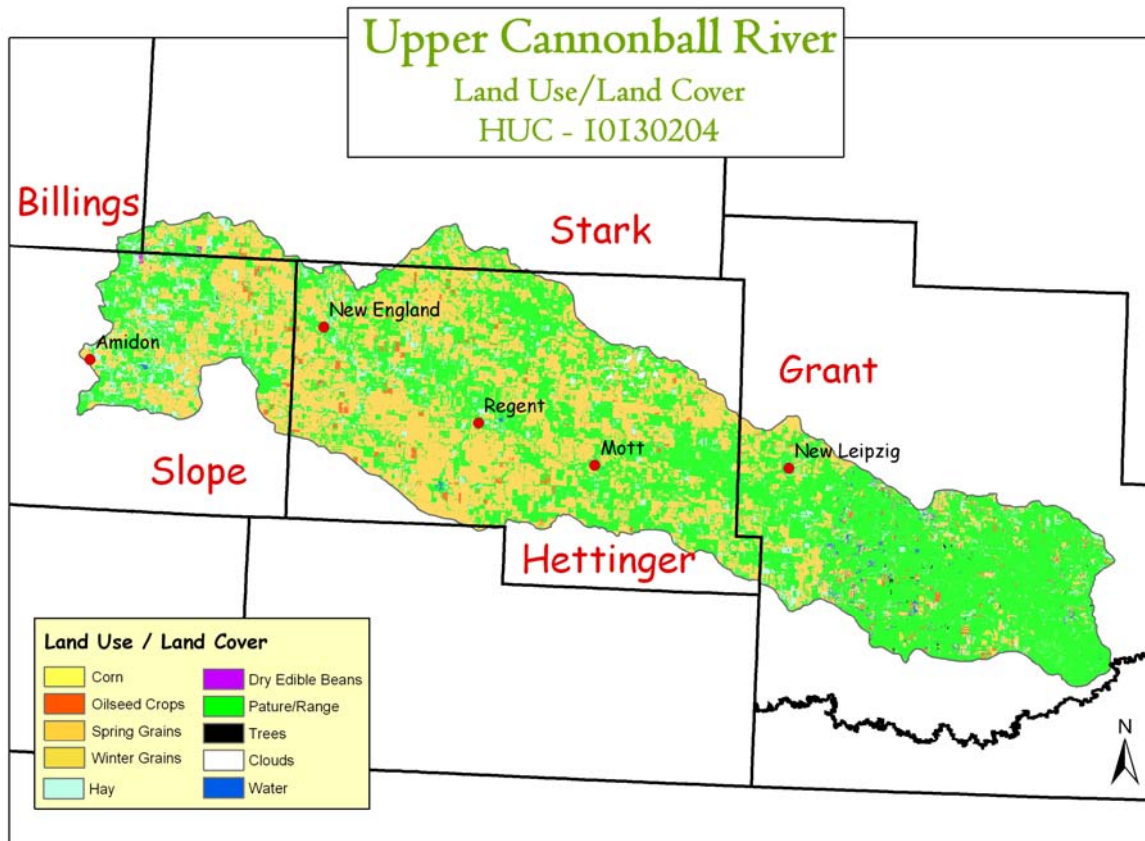
Land Cover/ Land Use ( <i>National Resources Inventory [NRI]</i> ) <sup>1</sup>	Acres	Percent of HUC
Forestland	0	0%
Cropland	556,200	55%
Conservation Reserve Program (CRP) Land <sup>2a</sup>	11,200	1%
Tame Grass/Hayland	55,000	5%
Pastureland	18,800	2%
Rangeland	297,100	30%
Urban/Farmstead/ Transportation Land	43,5000	4%
Water/Wetlands	6,200	1% *
Federal Lands	18,900	2%
<b>North Dakota HUC Totals <sup>b</sup></b>	<b>1,006,900</b>	<b>100% *</b>
* Less than one percent of total acres. See below for special considerations. a: Estimate from Farm Service Agency records and include CRP/CREP. b: Totals may not add due to rounding and small unknown acreages.		
<b>Irrigated Land</b> ( <i>ND State Water Commission Estimates</i> )	1,000	<1%

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### Physical Description – Continued



The above map was developed from U.S. Geologic Survey's (USGS) ND Gap Analysis Program data.<sup>3</sup>

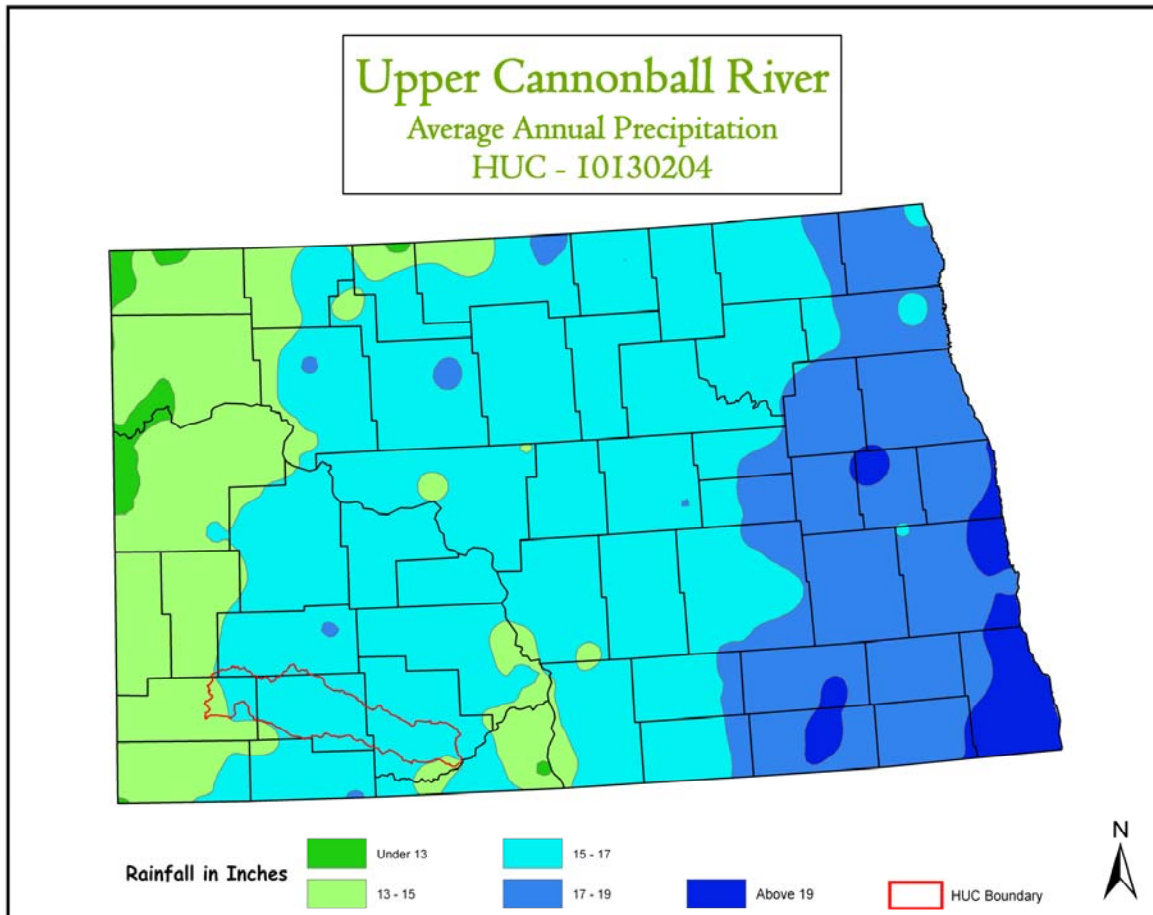
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### Physical Description – Continued

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)



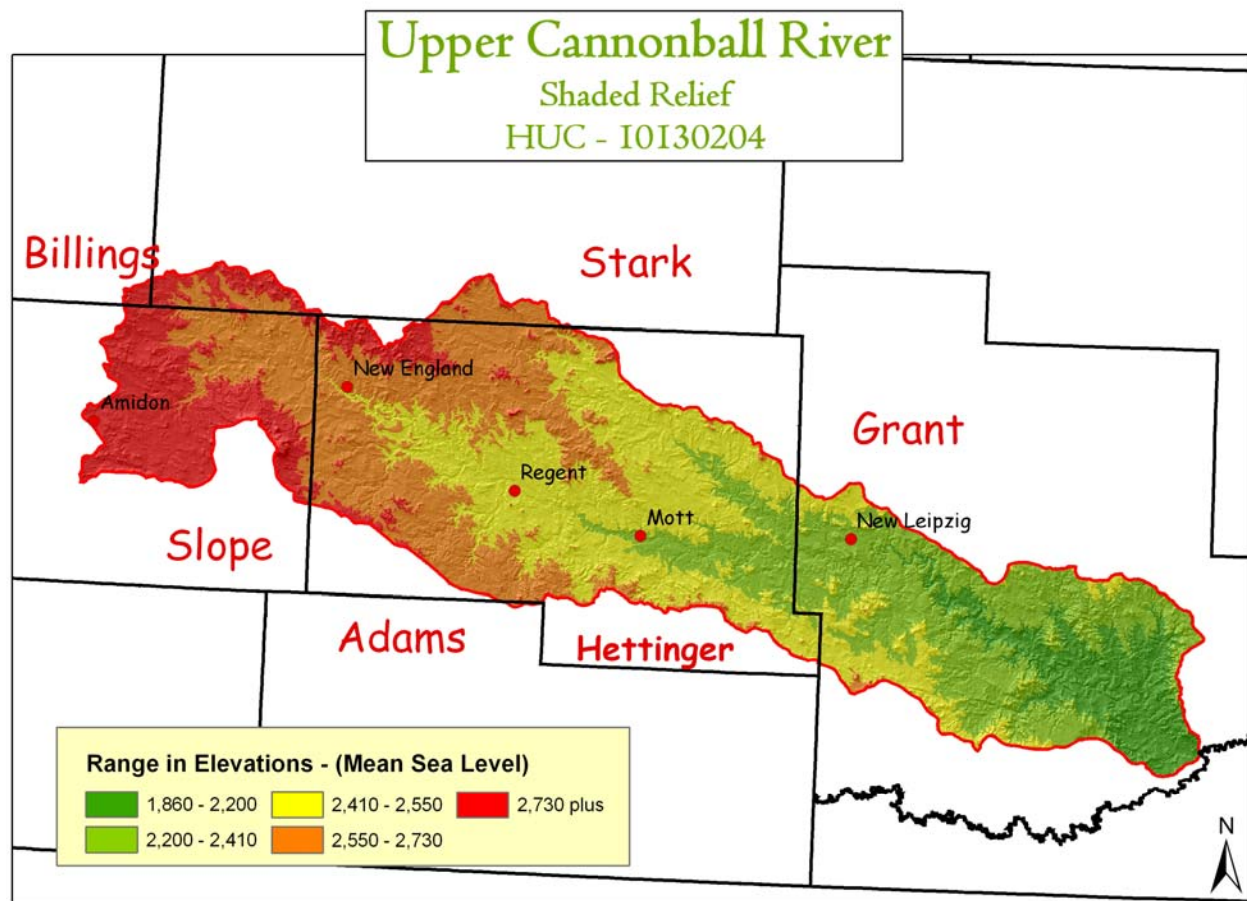
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### **Physical Description – Continued**

The sub-basin is part of the Missouri River Region, Missouri-Oahe Sub-Region. All drainage patterns flow to the east southeast into the Lower Cannonball Sub-basin before flowing into the Missouri River. The following map shows the relief for the sub-basin.<sup>4</sup>



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### 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	Upper Cannonball River Sub-basin <sup>5</sup>	Upper Cannonball River as percent of North Dakota	Impaired Water Quality (303d) <sup>6</sup>	Percent Impaired* Upper Cannonball River
<b>Water Quality Data</b>	Total – Major Water bodies						
	Rivers/Streams	Miles	56,687 <sup>7</sup>	2,580	4.6%	145	5.6%
	Lakes/Reservoirs	Acres	434,658 <sup>8</sup>	426	0.1%	306	71.8%

*\*Percent of Total Miles and acres in HUC*

Animal Feeding Facilities – North Dakota Department of Health Permit <sup>9</sup>					
Animal Type	Dairy	Beef	Swine	Other	Total
Number of Animal Feeding Operations	4	7	1	3	15
Number of Animals	490	5,600	660	138	6,888
Number of State Permitted Operations					10

Livestock Numbers (rounded to nearest 100) <sup>10</sup>					
	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
Upper Cannonball River	48,100	25,400	1,100	2,700	2,400
Upper Cannonball River as a percent of North Dakota	2.6%	2.6%	3.2%	1.9%	2.1%



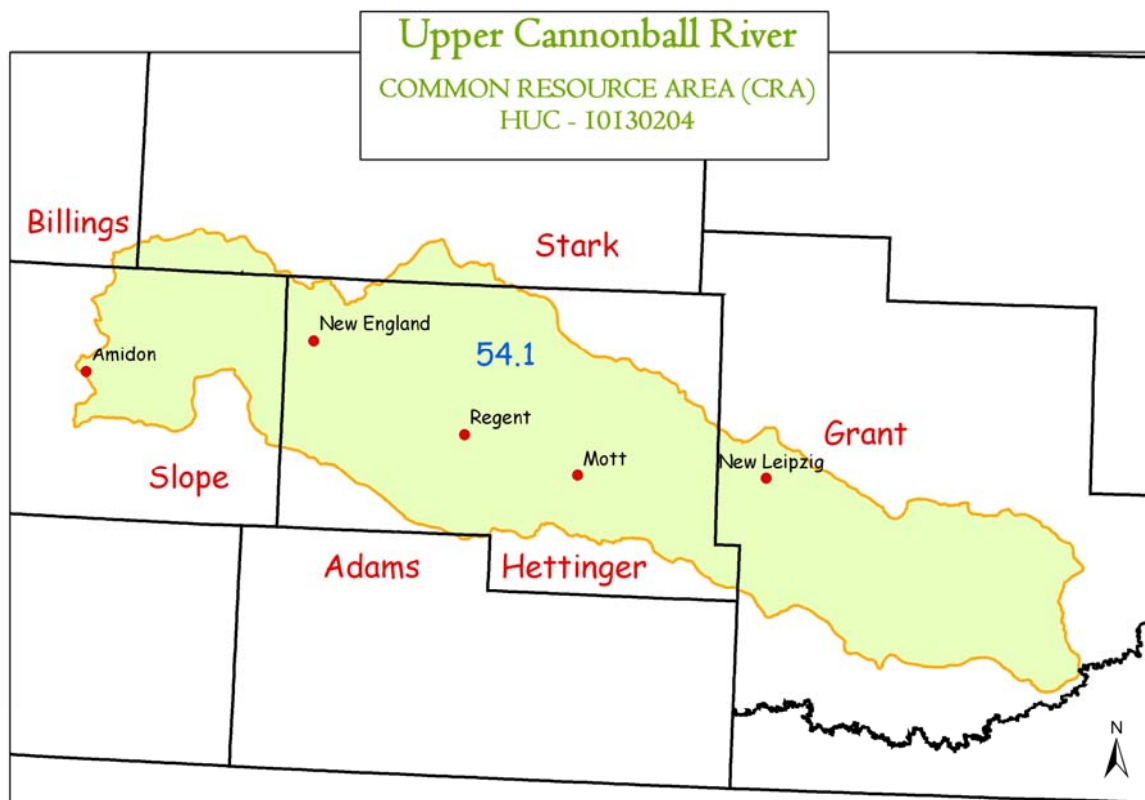
# Upper Cannonball River 10130204

## *8-Digit Hydrologic Unit Profile*

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### **Physical Description – Continued**

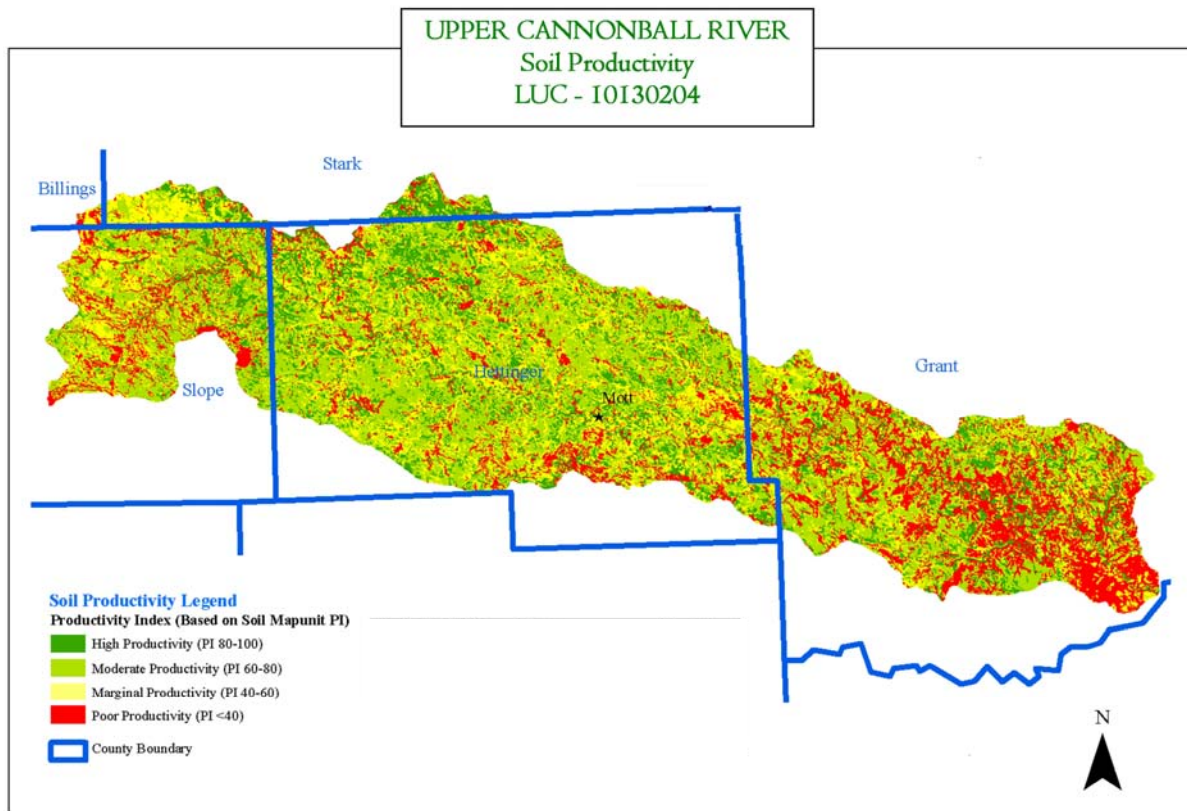
Common Resource Areas (CRA's) are geographical areas where resource concerns, problems, or treatments are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information were used to determine the geographic boundaries. CRA's are subsets of Major Land Resource Areas. The following map<sup>11</sup> shows the CRA's for the Upper Cannonball 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.

### **Soil Productivity** <sup>12</sup>

The Upper Cannonball River sub-basin has high variability in soil productivity.



### **Common Land Unit**

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



# Upper Cannonball River 10130204

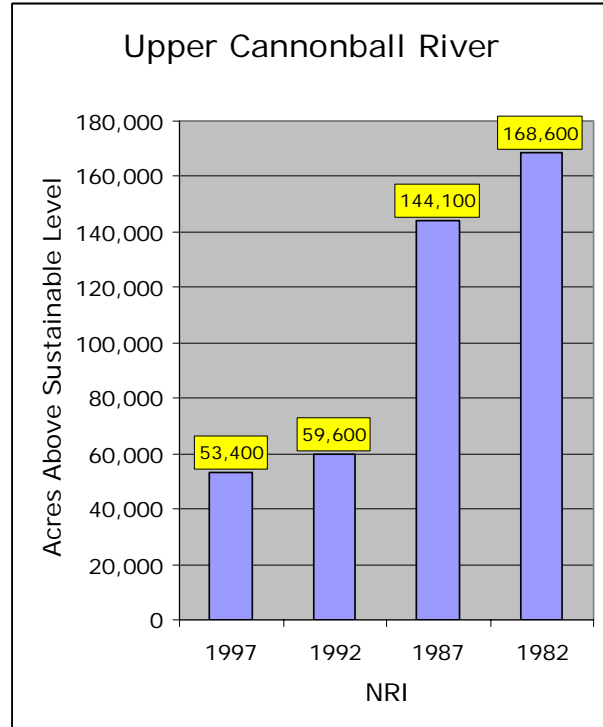
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### Resource Concerns

One of the goals of the NRCS 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.

- ❖ Acres of land experiencing erosion rates above sustainable levels have decreased to 53,400 acres in 1997, as compared to 168,600 acres in 1982.
- ❖ NRI estimates indicate 13,100 acres of the sub-basin agricultural lands still have water erosion rates above a sustainable level in 1997.
- ❖ Estimates show 40,300 acres of the sub-basin agricultural lands still have 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, erosion rates on cultivated cropland were 2.34 tons/acre/year in 1997.
- ❖ NRI estimates indicate 326,600 acres of Highly Erodible Land (HEL) being farmed in 1997 compared to 401,200 acres in 1987. This is slightly over an 18% reduction in HEL being farmed.
- ❖ Five out of the 8 water bodies on the 303(d) listed in hydrologic unit code 10130204 are listed for total fecal coliform. The others were for nutrient/eutrophication and biological indicators. Lack of adequate livestock grazing systems and feedlots are having an affect on the streams.
- ❖ Conservation practices that can be used to address these water quality issues include grazing management, erosion control, nutrient and agricultural waste management, and riparian buffers.



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### 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.

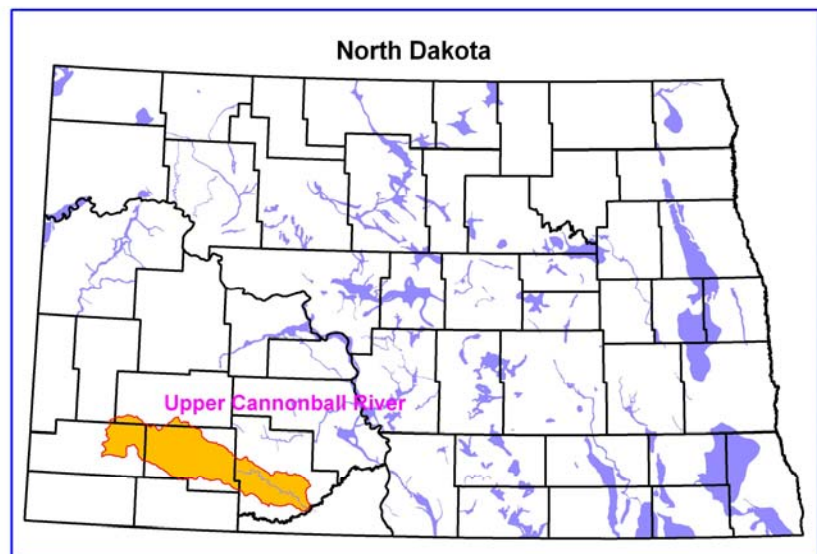
Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		NRCS Watershed Plans, Studies & Assessments	
Name	Status	Name	Status
Mott	Complete	Sheep Creek Watershed	Completed SVAP & AGNPS
NDDH TMDLs		Soil Conservation District Assessments and Studies	
Number Listed		Name	Status
Lakes/Reservoirs – 2	Streams – 5	Sheep Creek Watershed Upper Cannonball Assessment	Ongoing Ongoing
EPA 319 Watershed Projects			
Name		Status	
Southwest NPS I&E - EPA 319 Project NDSU Livestock Waste I&E – EPA 319 Project Livestock Facility Assistance Program		Ongoing Ongoing Ongoing	

### Soil

- Sandy soils and steep soils still require conservation practices to control excessive soil erosion.
- 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

- Agricultural wastes, sediment, and nutrients are primary water quality pollutants impairing the watershed streams and lakes.
- The Cannonball River has a large number of livestock operations on or near the river which impact nutrient loading and total fecal coliform.
- **Aquifers**<sup>13</sup> - There is one aquifer (Cannonball River Valley) located below the Upper Cannonball River sub-basin (see adjacent map).



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### **Resource Concerns – Continued**

#### **Air**

- Blowing and drifting snow can be a dangerous hazard during winter months with high snow fall

#### **Plants**

- Major concerns are with controlling invasive weeds and maintaining good pasture condition.
- Direct seeding and annual cropping has been successful in the higher rainfall (12 inches plus) zone.
- Soil erosion and low organic matter remain resource concerns.
- Conventional tillage systems are still utilized in some areas.
- Noxious weeds and poor range condition reduce productivity for livestock and wildlife.
- U.S. Forest Service has public land within the watershed that is utilized by ranchers.

#### **Animals**

- Animals on the threatened and endangered list are noted in the table below.

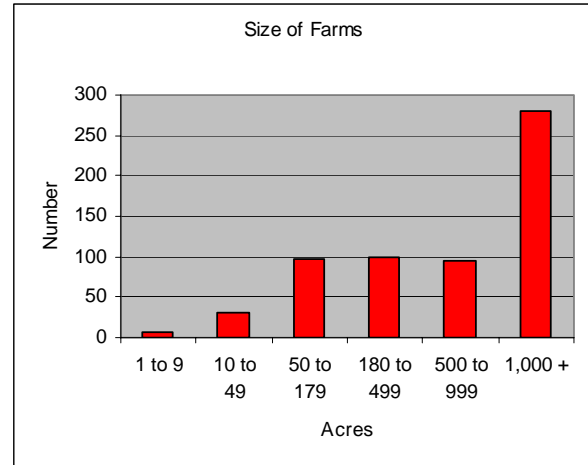
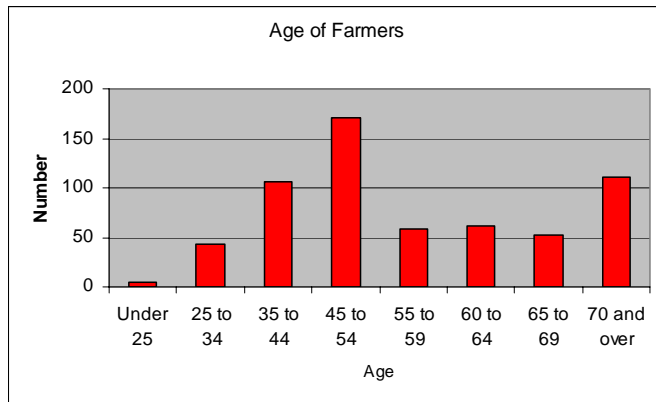
Federally Listed Threatened And Endangered Species			
Species Category	Threatened	Endangered	Candidate
Mammals	None	Black-Footed Ferret	None
Birds	Bald Eagle	Whooping Crane	None
Fish	None	None	None
Invertebrates	None	None	None
Plants	None	None	None
Critical Habitat – None			

### Census and Social Data<sup>14</sup>

**Number of Farms: 605**

**Number of Operators:**

- Average Age: 55
- Full-Time Operators: 68%
- Part-Time Operators: 32%



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

**MODERATE**

### **Limited Resource and Beginning Farmer**

About 4% of the operators are minority producers. Limited Resource Farmers are also estimated at just less than 7%. 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.

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### **References**

- <sup>1</sup> USDA-NRCS, NRI data.
- <sup>2</sup> USDA-Farm Services Agency, Common Land Unit GIS data layer, 2005.
- <sup>3</sup> USDI-US Geologic Services, ND GAP analysis data, 2005.
- <sup>4</sup> USDA-NRCS, Natural Resources Planning Staff, 30 meter Relief Data GIS data layer, 2002.
- <sup>5</sup> ND Department of Health, Environmental Health Section, Water Quality Division, National Hydrography GIS layers, June 2006.
- <sup>6</sup> 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.
- <sup>7</sup> ND Department of Transportation, GIS Layers, 2006
- <sup>8</sup> ND Game and Fish Department, GIS Layers, 2006
- <sup>9</sup> ND Department of Health, Environmental Health Section, Water Quality Division, Animal Feeding Operations Program data, 2006.
- <sup>10</sup> 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)
- <sup>11</sup> USDA-NRCS, Natural Resources Planning Staff, Common Resource Area GIS data layer, 2004.
- <sup>12</sup> USDA-NRCS, Natural Resources Planning Staff, Soils Productivity GIS data layer, 2004.
- <sup>13</sup> ND Department of Health, Environmental Health Section, Water Quality Division, Ambient Ground Water Monitoring Program data, 1997.
- <sup>14</sup> 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)