

Upper James River 10160003

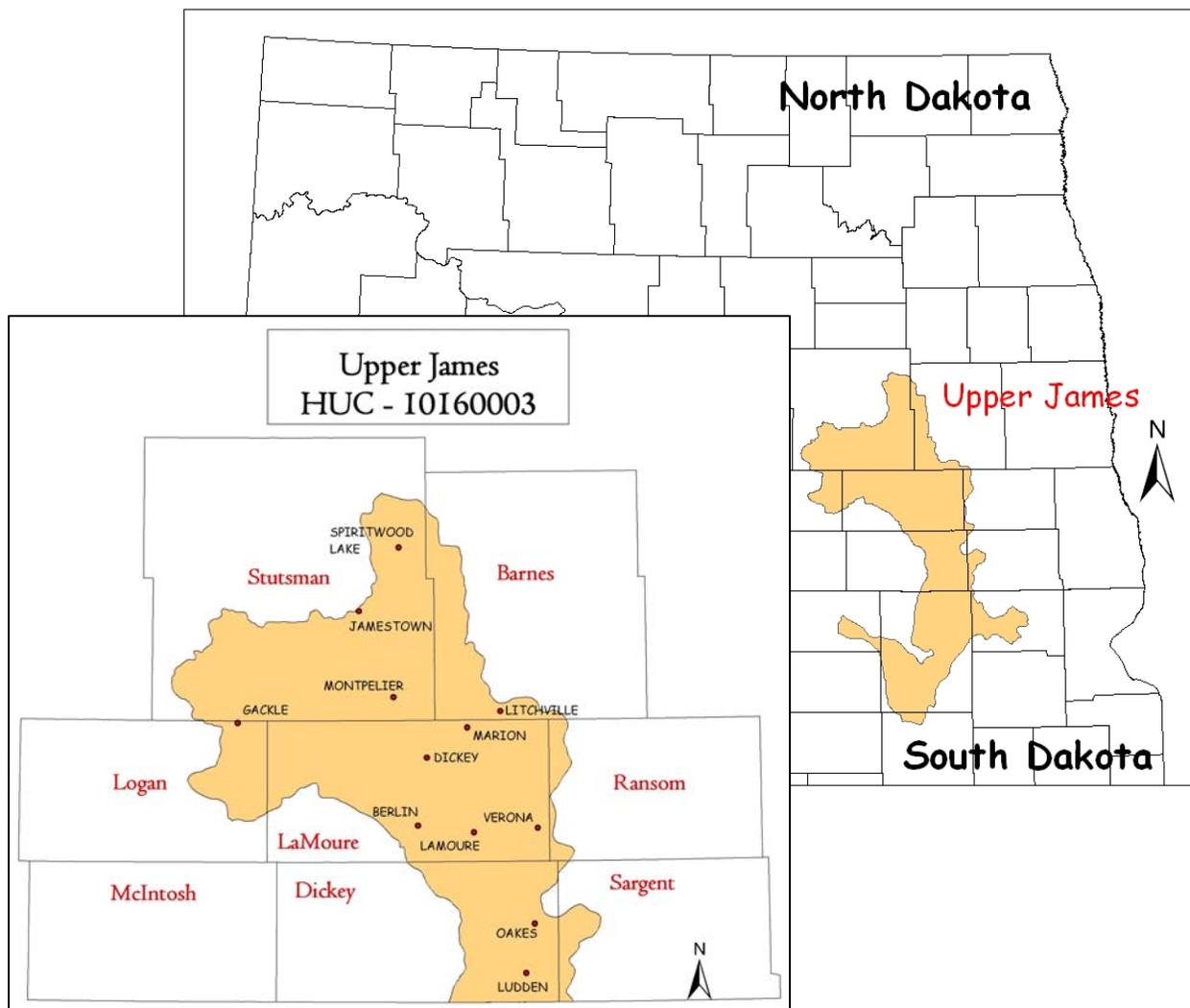
8-Digit Hydrologic Unit Profile

Revised July 2007

Introduction

The Upper James River 8-Digit Hydrologic Unit Code (HUC) (10160003) sub-basin includes land in North Dakota and South Dakota. There are approximately 2,712,500 acres in the entire sub-basin. This sub-basin is located in Missouri Region, James Sub-Region.

This report addresses only the portion located within North Dakota. The Upper James River is approximately 1,802,700 acres covering parts of 7 counties (Barnes, Dickey, LaMoure, Logan, Ransom, Sargent, and Stutsman) in North Dakota. Of the 1,802,700 acres, Stutsman County contains 33%, LaMoure 33%, Dickey 15%, Barnes 9%, Logan 6%, Ransom 2%, and Sargent 2%. There are approximately 1,400 farms in the sub-basin. The following two maps show the entire sub-basin and also the portion of the sub-basin located within North Dakota.



*Produced by
the Natural
Resources
Planning Staff
Bismarck, ND*

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



Upper James River 10160003

8-Digit Hydrologic Unit Profile

Revised July 2007

Introduction – Continued

This sub-basin encompasses commodities ranging from corn, soybeans, wheat, barley, alfalfa, sunflowers, and dry edible beans to beef cattle, dairy cattle, swine, poultry, and bees.

Conservation assistance is provided by seven Natural Resources Conservation Service (NRCS) Service Centers and two Resource Conservation & Development Offices.

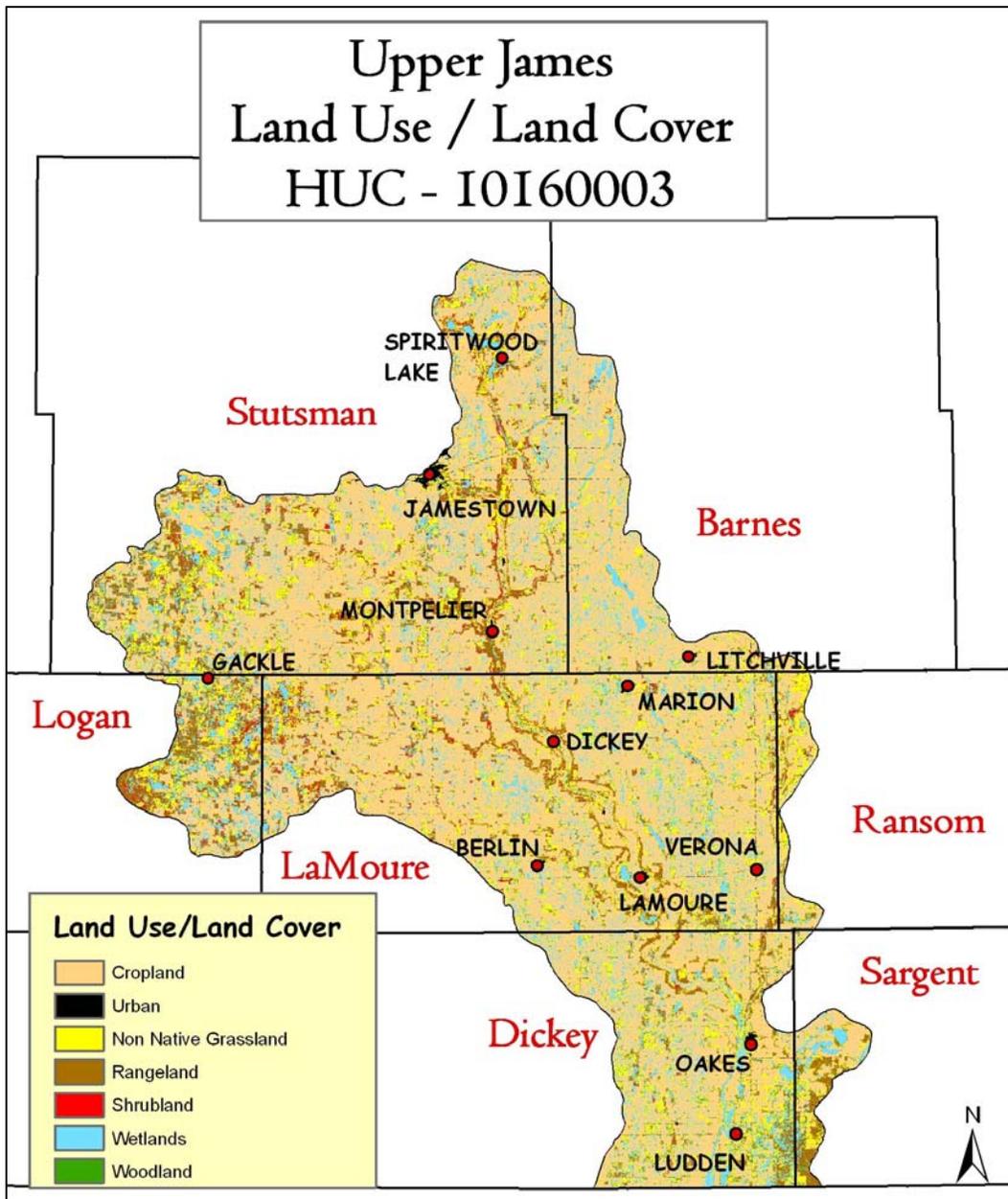
Physical Description

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

Land Use / Land Cover (<i>National Resources Inventory [NRI]</i>) ¹	Acres	Percent of HUC
Forestland	0	*
Cropland	1,177,900	65%
Conservation Reserve Program (CRP) Land ^{2 a}	120,200	7%
Tame Grass/Hayland	69,300	4%
Pastureland	82,900	4%
Rangeland	212,000	12%
Urban/Farmstead/Transportation Land	107,000	6%
Water/Wetlands	21,300	1%
Federal Lands	0	*
North Dakota HUC Totals ^b	1,802,700	100% *
<i>* 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.</i>		
Irrigated Land (<i>Farm Services Agency</i>) ³	27,800	1.5%

Physical Description – Continued

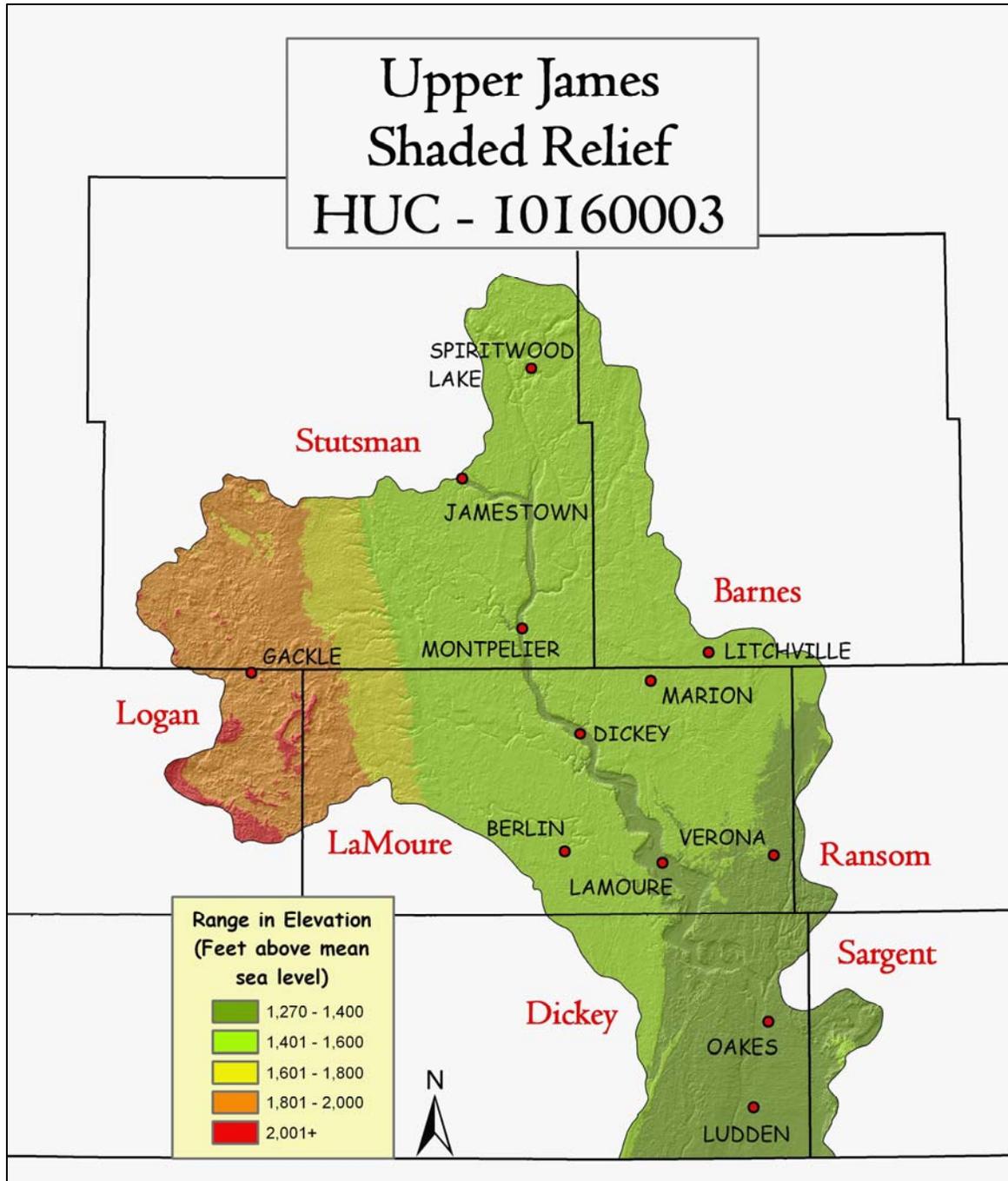
Land Use/Land Cover Map



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

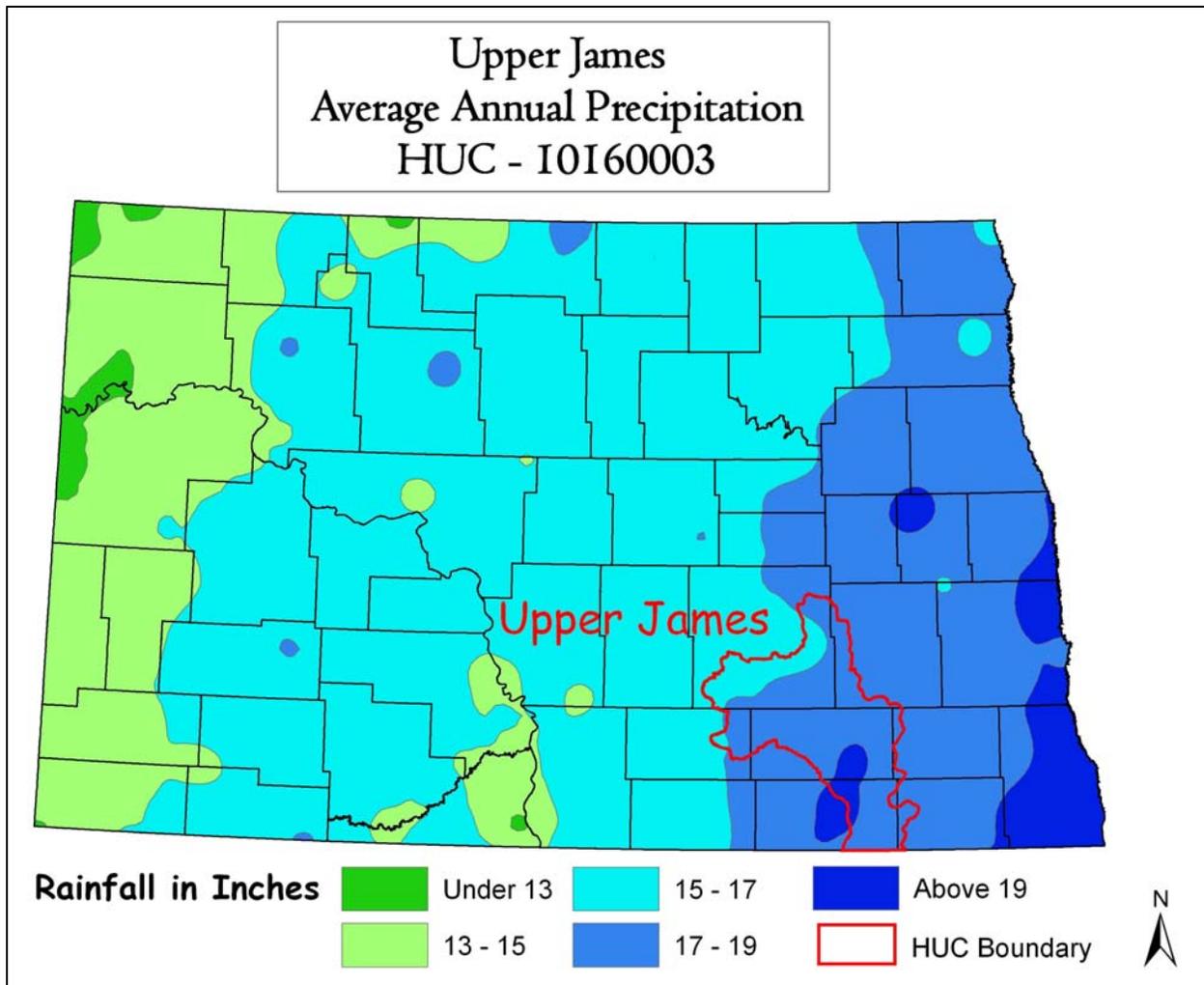
Physical Description – Continued

The sub-basin is part of the Missouri River Region - James River Sub-Region. The drainage patterns flow to the south ending at the Missouri River, near Yankton, SD. The following map shows the relief for the sub-basin.⁵



Physical Description – Continued

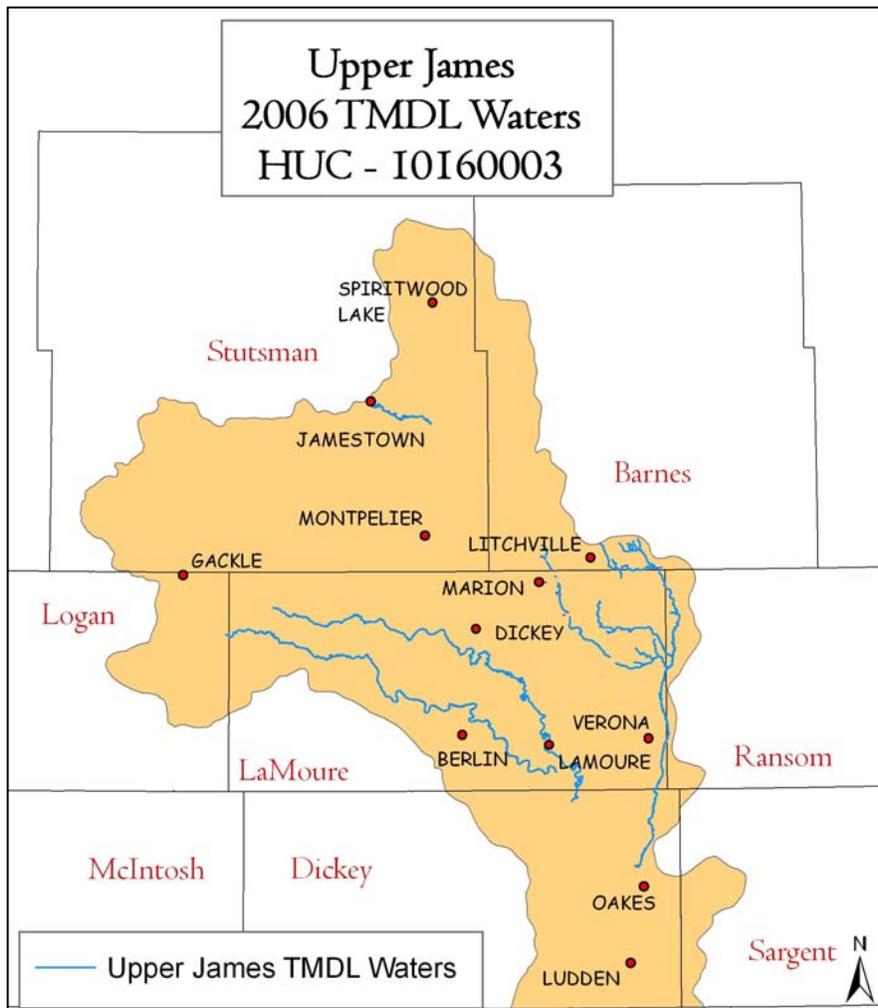
The following map is a plot of 1961-1990 annual average precipitation contours from National Oceanic and Atmospheric Administration (NOAA) Cooperative Stations and (where appropriate) USDA-NRCS Snowpack Telemetry (SNOTEL) Stations. Christopher Daly used the PRISM (Parameter-elevation Regressions on Independent 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 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. A map showing the Total Maximum Daily Load (TMDL) waters within the watershed follows the table. TMDL is the amount of a particular pollutant that a particular stream, lake, estuary, or other waterbody can "handle" without violating state water quality standards.

		Units	Upper James River Sub-basin ⁶	Upper James River Impaired Water Quality (303d) ⁷	Percent Impaired* Upper James River
Water Quality Data <i>*Percent of Total Miles and acres in HUC</i>	Total – Major Water bodies				
	Rivers/Streams	Miles	1,078	272.4	25.6
	Lakes/Reservoirs	Acres	0	0	0



Upper James River 10160003 *8-Digit Hydrologic Unit Profile*

Revised July 2007

Physical Description – Continued

The following two tables show feeding operations, permitted operations, and livestock numbers. The first table lists the number of animal feeding operations and animals as tracked by the North Dakota Department of Health. The second table shows livestock numbers for all cattle, beef cows, dairy cows, hogs and pigs, and sheep and lambs. These livestock numbers were extrapolated from 2002 Agricultural Census county data to 8-digit HUC's.

Animal Feeding Facilities – North Dakota Department of Health Permit⁸					
Animal Type	Dairy	Beef	Swine	Other	Total
Number of Animal Feeding Operations	18	69	22	7	116
Number of Animals	1,246	22,860	13,200	125	37,431
No. of State Permitted Operations					64

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
Upper James River	87,000	38,000	2,300	11,500	4,500
Upper James River as a percent of North Dakota	4.6%	3.9%	6.7%	8.3%	3.9%

Physical Description – Continued

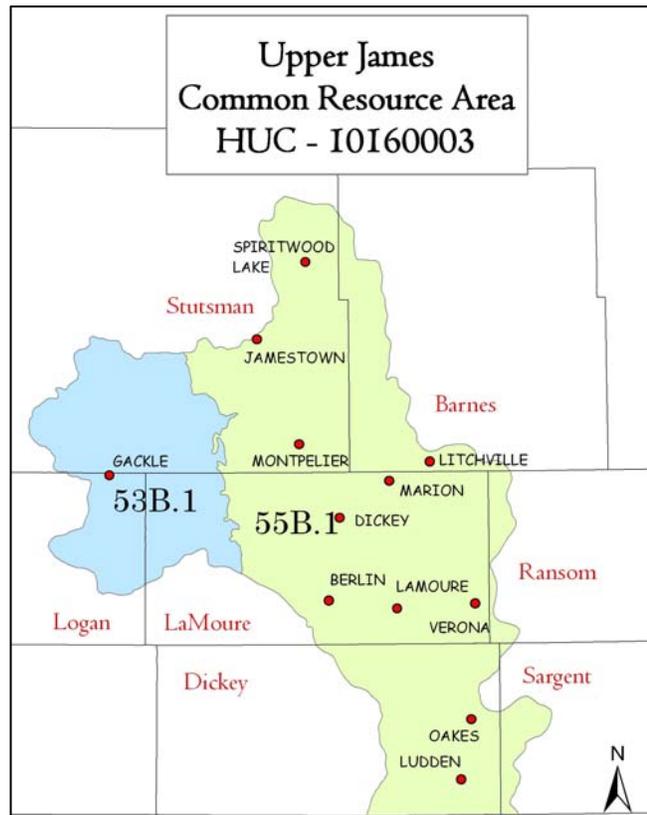
Common Resource Areas (CRAs) are geographical areas where resource concerns, problems, or treatments are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information were used to determine the geographic boundaries. CRAs are subsets of Major Land Resource Areas. The following map¹⁰ shows the CRAs for Upper James River sub-basin with the descriptions below.

53B.1 The Central Dark Brown

Glaciated Plains: The Central Dark Brown Glaciated Plains are nearly level to rolling with steeper areas along rivers. Land use is a mosaic of cropland and rangeland. Soil textures are dominantly loamy in glacial till, sandy in outwash areas, and clayey in lacustrine areas. Most soils are moderately deep or deep, well drained or moderately well drained, and have a frigid temperature regime.

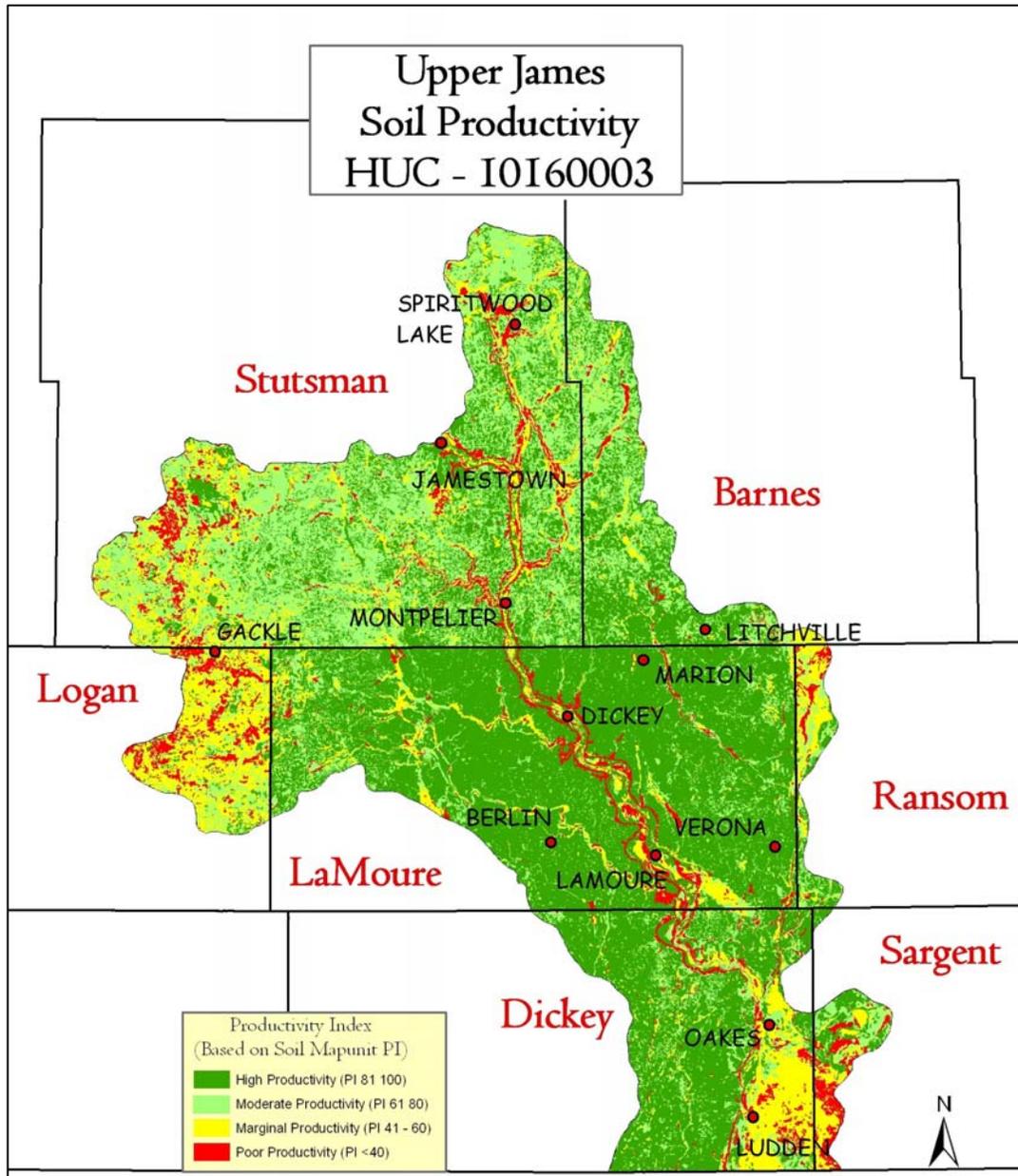
55B.1 – Central Black Glaciated Drift

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.



Soil Productivity ¹¹

The Upper James sub-basin has three distinct land forms which coincide to three distinct soil productivity regions. Marginally productive soils are affected by the Missouri Coteau in the northwestern portion of this region and the James River Valley affects soils within its reaches. Poorly productive soils are prevalent in the Sheyenne Delta or the southwestern portion of Sargent County. The remainder of the region is highly productive.





Upper James River 10160003

8-Digit Hydrologic Unit Profile

Revised July 2007

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.

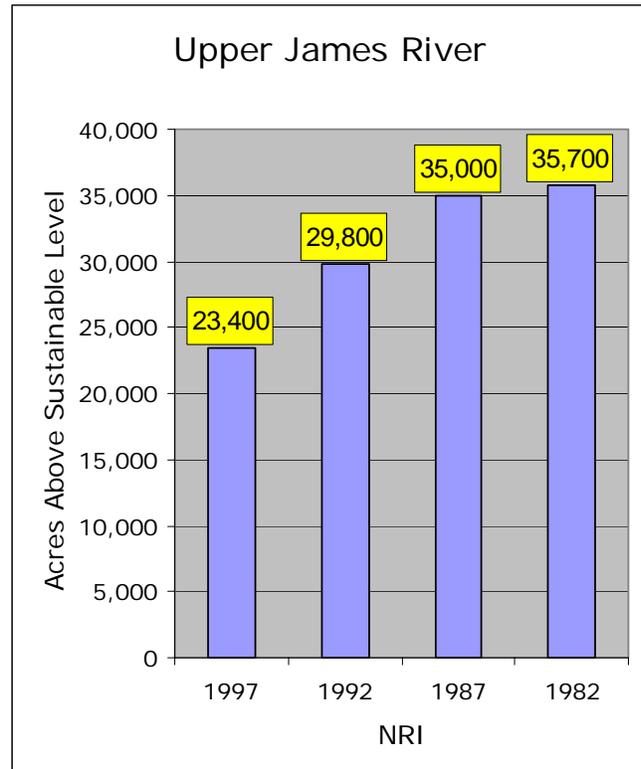
The following table shows the different projects, plans, studies, and assessments conducted within the sub-basin.

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		NRCS Watershed Plans, Studies & Assessments	
Name	Status	Name	Status
Maple River, West Branch	Withdrawn	Bonehill Creek Watershed Stream Assessment	Complete
		Bear Creek Stream Assessment	Complete
		Cottonwood Creek Watershed Land Use Assessment	Complete
NDDH TMDLs		Soil Conservation District Assessments and Studies	
Number Listed		Name	Status
Lakes/Reservoirs - 0	Streams - 7	Seven Mile Watershed	Ongoing
		Beaver Creek Watershed	Ongoing
		Spiritwood Lake Watershed	Ongoing
		Bonehill Creek Watershed	Complete
		Bear Creek	Complete
		Cottonwood Creek (Lake LaMoure) Watershed	Complete
EPA 319 Watershed Projects			
Name		Status	
Bonehill Creek Watershed		Ongoing	
Cottonwood Creek Watershed		Ongoing	
Bear Creek Watershed		Ongoing	

Resource Concerns - Continued

Soil

- The HEL cropland acreage experiencing erosion rates above sustainable levels decreased to 23,400 acres in 1997, as compared to 35,200 acres in 1982.
- NRI estimates indicate there was a 73 percent reduction from 1987 to 1997 in the amount of Highly Erodible Land (HEL) being farmed.
- Through NRCS programs, many farmers and ranchers have applied conservation practices to reduce the effects of wind erosion. From 1982 to 1997, the average wind erosion rate reduced from 5.2 t/ac/y to 3.8 t/ac/y on all cultivated cropland.
- 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.
- Sandy soils and irrigated soils still require conservation practices to control excessive soil erosion.
- Soil health, especially compaction on silty and clayey soils and organic matter on sandy soils.
- Soil erosion and low organic matter remain resource concerns.
- Windbreak plantings, reduced tillage systems, and improved cropping systems are still needed.
- Grassed waterways are still needed to help reduce ephemeral gully erosion.
- Sediment accumulation is reducing storage capacities in Spiritwood Lake and the Jamestown Reservoir. Other lakes within the sub-basin may also be experiencing reduced capacities because of sediment accumulation.
- Cropping systems are needed to help reduce salinity and alkalinity on some soils.
- Stream bank failure and slumping are resource concerns along watercourses leading into the James River.



Resource Concerns - Continued

Water

- Aquifers¹²** - There are sixteen glacial drift aquifers (Seven Mile Coulee, Jamestown, Spiritwood, Windsor, Homer, Klose, Buffalo Creek-Upper, Sydney, Nortonville, LaMoure, Sand Prairie, Edgeley, Ellendale, Guelph, Oakes, and Brampton) underlying the Upper James sub-basin. A number of these aquifers supply municipal sources of water.



- Wellhead Protection Areas¹³** – there are ten protection areas located in the sub-basin. They are designated to protect municipal water supplies.
- One stream section on the 303(d) list in hydrologic unit code 10160003 is listed for ammonia and dissolved oxygen. The other six were for total fecal coliform.
- 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.
- The James River has water quality impacts from sedimentation and siltation. There are fifteen shallow aquifers and one deep aquifer that are considered sensitive to nitrate and pesticide leaching.
- Lack of adequate riparian buffer width and health are impacting water quality and stream health.

Resource Concerns - Continued

Water (cont.)

- Summer flooding does occasionally occur and impacts crop production along the James River and its tributaries.
- Water conservation and water quality (potential for pesticide contamination) are issues on irrigated cropland.
- Leaching of nitrogen into the groundwater is a concern on high water table soils.
- Sheet and rill erosion due to improper residue management, poor crop rotations, overgrazing, and excess tillage is a concern.
- Urban and ag runoff are a concern for excessive nutrients and organics of surface water.
- Excessive runoff due to tilling is becoming a major concern.
- Water use and conservation are concerns for irrigated cropland.
- Water erosion is a severe hazard on gently sloping and steeper soils. The hazard is greatest when the soil is bare during crop establishment.

Air

- Visibility is reduced during winter months from blowing snow.
- Increased wind speeds due to tree/shelterbelt removal.
- Soil blowing is a severe hazard on the coarse textured and moderately textured soils.
- Nearly all soils can be damaged by soil blowing if they are bare.

Plants

- Major concerns are controlling invasive weeds and maintaining good pasture condition.
- Direct seeding of corn and soybeans has been successful in some locations.
- Conventional tillage systems are still utilized, especially with potatoes and dry beans.
- Noxious weeds and poor range condition reduce productivity for livestock and wildlife.
- Native species not being replaced after land disturbances take place is a major concern.
- Season long grazing on or near water courses are of a concern for riparian health.



Upper James River 10160003

8-Digit Hydrologic Unit Profile

Revised July 2007

Resource Concerns - Continued

Animals

- Lack of tall grasses is a concern for the limited number of prairie chickens and pheasants.
- Animals that are threatened and endangered can be seen in the following table of threatened and endangered species.

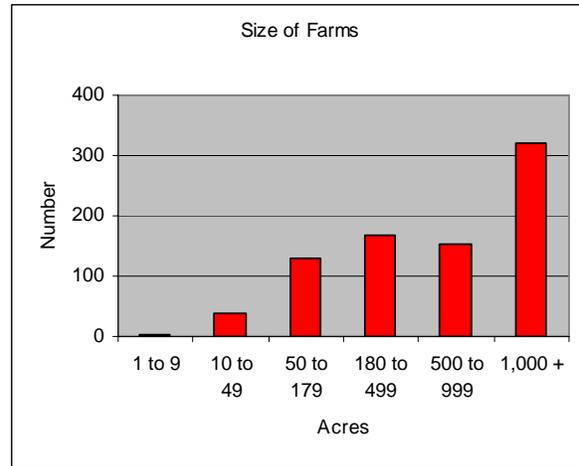
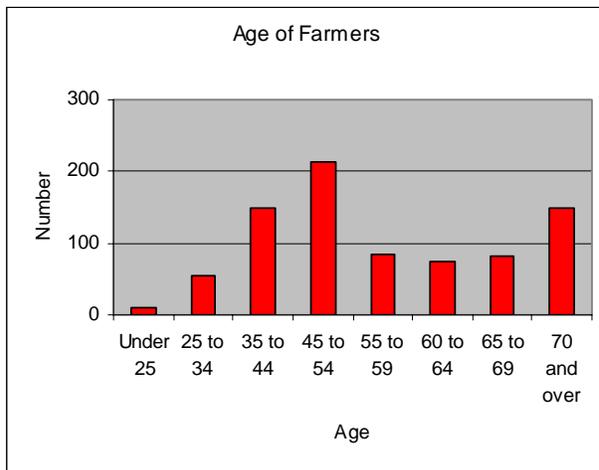
Federally Listed Threatened And Endangered Species			
Species Category	Threatened	Endangered	Candidate
Mammals	None	Gray Wolf	None
Birds	Bald Eagle Piping Plover	Whooping Crane	None
Fish	None	None	None
Invertebrates	None	None	Dakota Skipper
Plants	None	None	None
Critical Habitat – Piping Plover			

Census and Social Data¹⁴

Number of Farms: 1,400

Number of Operators:

- Average Age: 55
- Full-Time Operators: 69%
- Part-Time Operators: 31%



Limited Resource and Beginning Farmer

Approximately 4 percent of the operators are minority producers. Limited Resource Farmers are estimated at less than 5 percent. Although rather low percentages, these facts 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.

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.



Upper James River 10160003

8-Digit Hydrologic Unit Profile

Revised July 2007

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, 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 ND Department of Health, Environmental Health Section, Water Quality Division, Source Water Protection Program data, 2003.
- ¹⁴ 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)