
Rapid Watershed Assessment
Resource Profile

Middle Minnesota (MN) HUC: 07020007



Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

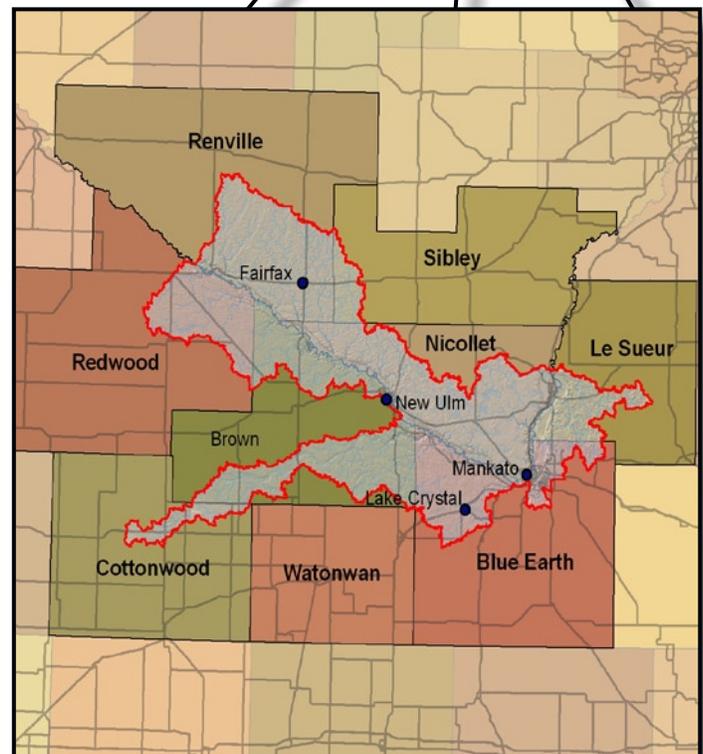
Introduction

The Middle Minnesota 8-Digit Hydrologic Unit Code (HUC) subbasin is located in the Prairie Parkland Ecological Province of Southwestern Minnesota. This largely agricultural watershed is 861,886 acres in size. Approximately ninety seven percent of the basin is comprised of private land, with the remainder owned or managed by a variety of public and tribal entities.

Estimates indicate 2,043 farms in the watershed. Approximately thirty one percent of the operations are less than 180 acres in size, fifty one percent are from 180 to 1000 acres in size, and the remaining farms are greater than 1000 acres.

The main resource concerns in the watershed are sediment and erosion control, stormwater management, drinking and source water protection, drainage management, waste management, nutrient management, surface water quality and wetland management.

Many of the resource concerns relate directly to topography, agricultural practices and increased development in the region resulting in increased sediment and pollutant loadings to surface and ground waters.



County Totals

County	Acres in HUC	% HUC
Renville	158,320	18.4%
Sibley	23,599	2.7%
Redwood	90,528	10.5%
Le Sueur	55,809	6.5%
Brown	186,174	21.6%
Nicollet	208,661	24.2%
Blue Earth	114,134	13.2%
Cottonwood	24,502	2.8%
Watonwan	159	0.0%
Total acres:	861,886	100%

Physical Description

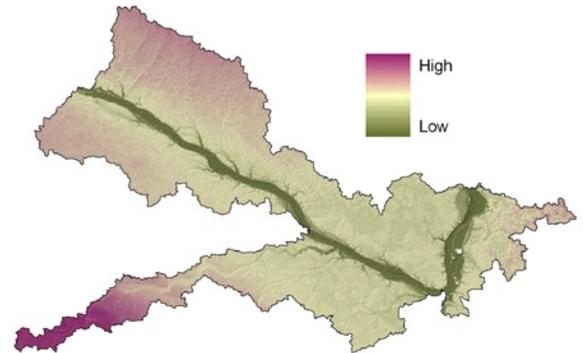
This once glaciated area is part of the Prairie Pothole Region. Soils in this HUC are predominantly glacial till plains. Average elevation in the watershed is 918 feet above sea level, with the highest values being in the Southwest and Northern portions of the watershed, while the lowest are found across the central regions, near the Minnesota River channel.

Precipitation in the watershed ranges from 25 to 29 inches annually. Most lands within this watershed are not highly erodible, and are well to moderately well suited to agricultural uses. Predominate land uses are row crops (76%), Residential / Commercial Development (6.7%), Wetlands (6.2%) Forest (3.9%) and Grass/Pasture/Hay (3.6%).

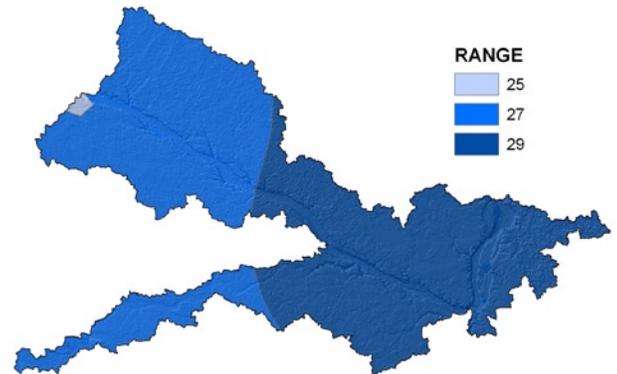
Land use within the Middle Minnesota watershed is primarily agricultural, accounting for approximately 80% of the available acres. Two-year corn/soybean rotations comprise close to 90% of cropped lands within the watershed; small grains, hay, and grasslands enrolled in the Conservation Reserve Program (CRP) make up the majority of the balance

Development pressure is moderate, with occasional farms being parceled out for recreation or country homes.

Relief

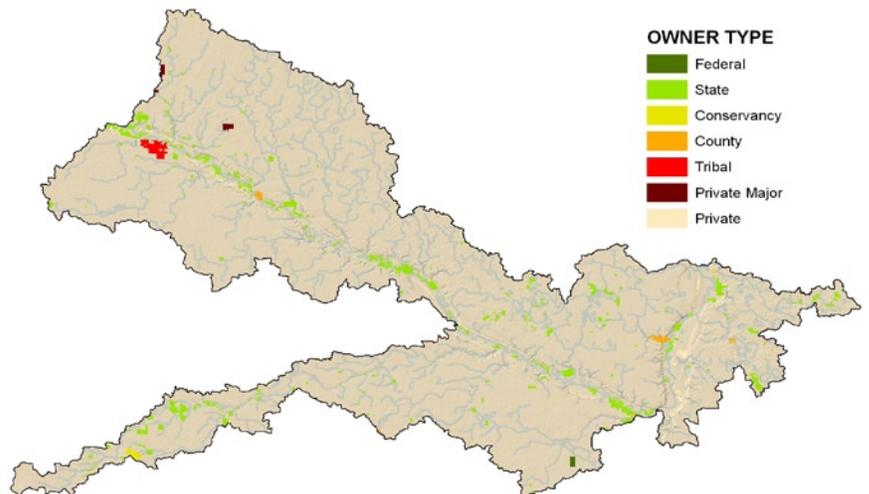


Average Precipitation



Ownership

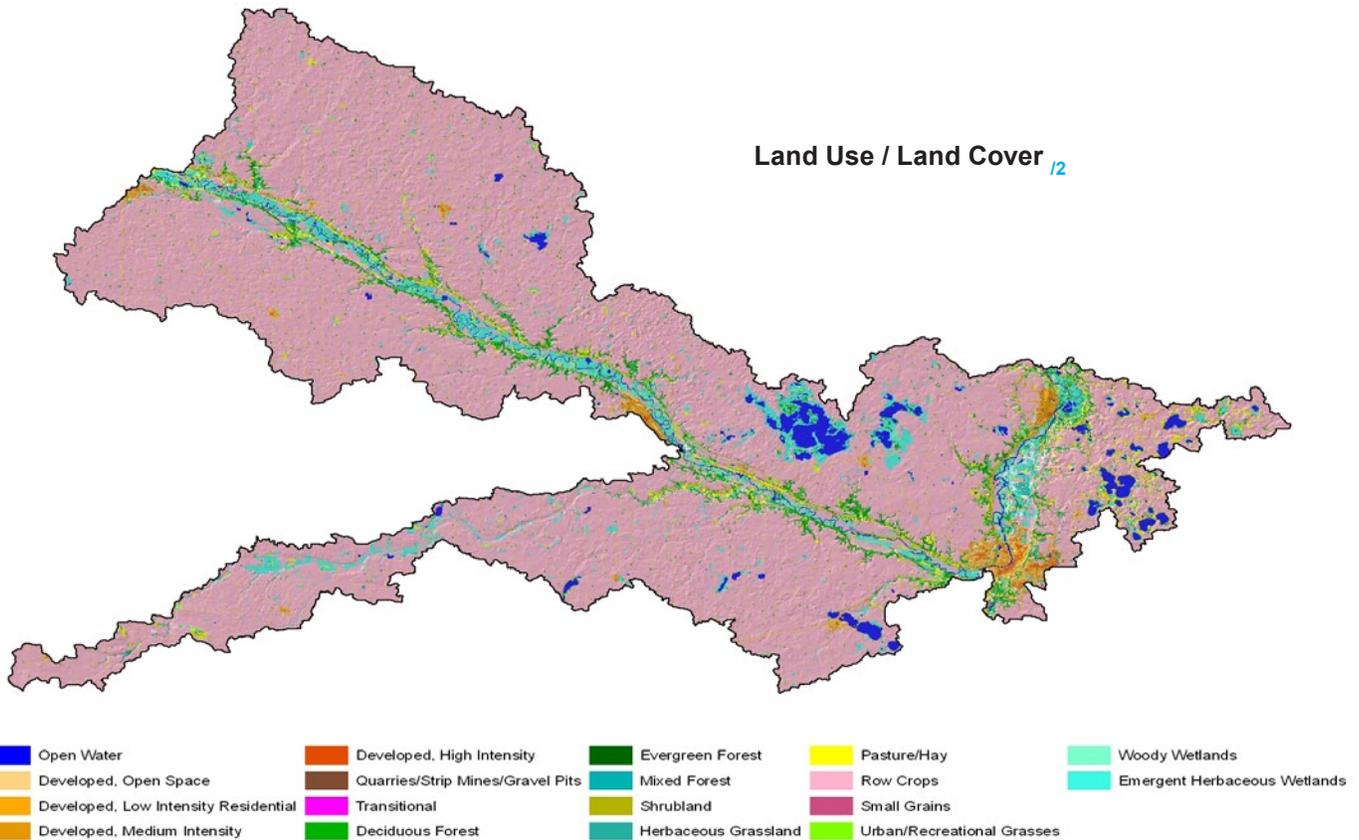
Ownership Type	Acres	% of HUC
Conservancy	637	0.1
County	1,069	0.1
Federal	324	0.0
State	21,323	2.5
Other	-	-
Tribal	1,746	0.2
Private Major	725	0.1
Private	836,062	97.0
Total Acres:	861,886	100



* Ownership totals derived from 2009 MN DNR GAP Stewardship data and are the best suited estimation of land stewardship available on a statewide scale at time of publication. See the bibliography section of this document for further information.

Ownership / Land Use

The Middle Minnesota Watershed covers an area of 861,866 acres. Ninety seven percent of the land in the watershed is held by private landowners (836,062 acres). The second largest ownership type is State, with just less than 21,325 acres (2.5%), followed by Tribal with 1,746 acres (0.2%), County with approximately 1,069 acres (0.12%), and Private Major with 725 acres (0.1%). Private Conservancy lands amount to 637 acres (0.07%), and Federally owned lands account for the smallest ownership class, covering 324 acres (0.04%). Land use by ownership type is represented in the table below.



Ownership / Land Use

¹³

Landcover/Use	Public		Private**		Tribal		Total Acres	Percent	
	Acres	% Public	Acres	% Private	Acres	% Tribal			
Forest	2,127	0.2%	31,346	3.6%	243	0.0%	33,716	3.9%	
Grass, etc	2,306	0.3%	28,405	3.3%	47	0.0%	30,757	3.6%	
Orchards	0	0.0%	0	0.0%	0	0.0%	0	0.0%	
Row Crops	22,658	2.6%	634,092	73.6%	780	0.1%	657,529	76.3%	
Shrub etc	150	0.0%	2,743	0.3%	64	0.0%	2,957	0.3%	
Wetlands	9,264	1.1%	43,973	5.1%	415	0.0%	53,652	6.2%	
Residential/Commercial	722	0.1%	57,242	6.6%	151	0.0%	58,114	6.7%	
Open Water*	1,119	0.1%	20,867	2.4%	46	0.0%	22,032	2.6%	
* ownership undetermined		** includes private-major							
Watershed Totals:	38,345	4.45%	818,667	95.0%	1,746	0.2%	861,886	100%	

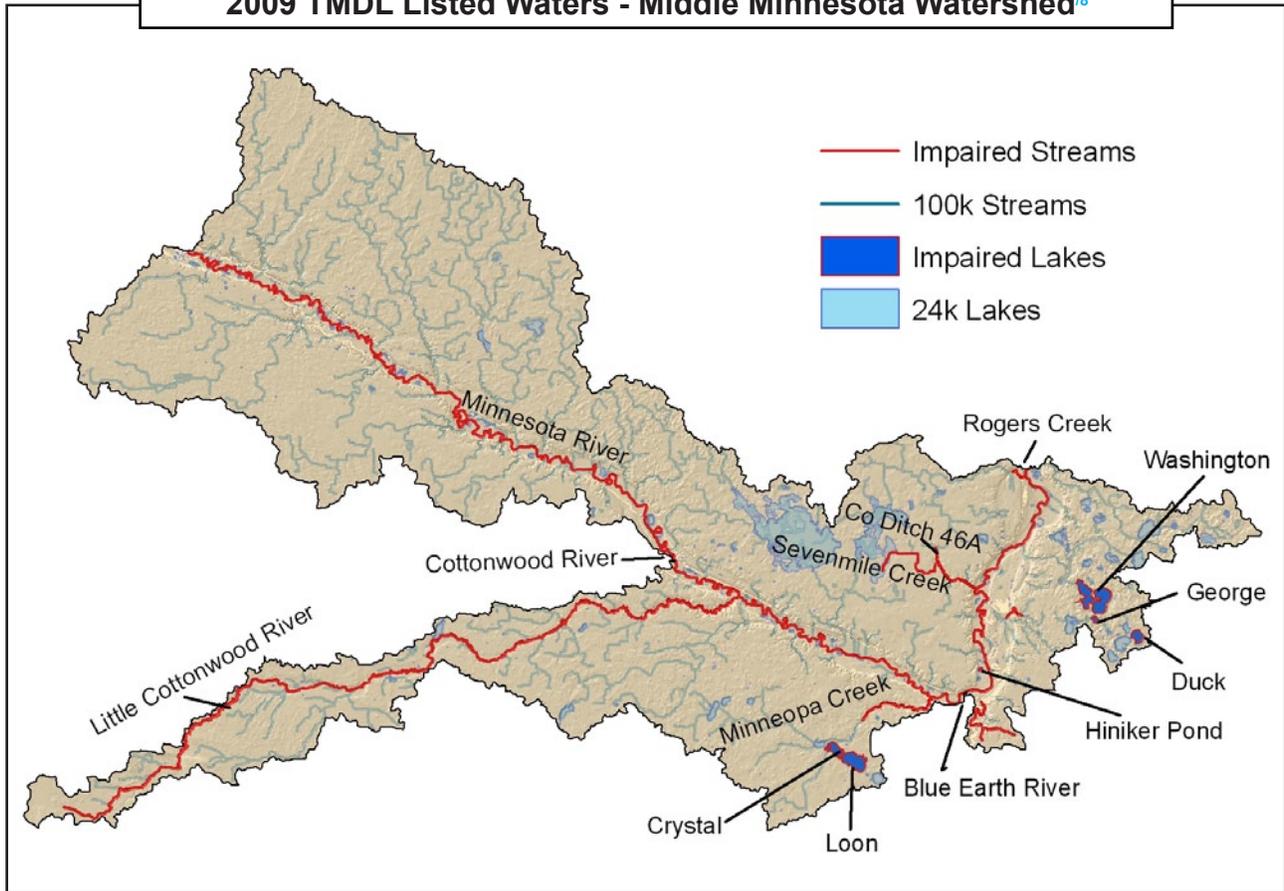
Physical Description (continued)

		ACRES	Cu. ft/sec
2008 Stream Flow Data	USGS 05320500 LE SUEUR RIVER NEAR RAPIDAN, MN	2008 Total Avg.	5,493
		May – Sept. Avg.	7,069
		2008 Peak	5,610
		ACRES/MILES	PERCENT
Stream Data⁴ (* % of 100k Stream Miles ** % 24k lake surface area)	Total Stream Miles (100K NHD Layer)	1,564	---
	2009 303d/TMDL Listed Streams (MPCA)	240.3	15.4%*
	TMDL Lakes Surface Area (Acres)	3,008	12.7%**
Riparian Land Cover/Land Use⁵ (Based on a 100-foot buffer on both sides of all streams in the Streams Layer)	Land Use Type	Acres	Percent
	Forest	3,500	9.9%
	Grain Crops	0	0.0%
	Grass, etc	1,756	4.9%
	Orchards	0	0.0%
	Row Crops	17,824	50.2%
	Shrub etc	48	0.1%
	Wetlands	5,914	16.7%
	Residential/Commercial	1,658	4.7%
	Open Water*	4,801	13.5%
	Total Buffer Acres:	35,500	100%
Crop and Pastureland Land Capability Class⁶ (Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)	1 – slight limitations	132,200	19%
	2 – moderate limitations	393,600	57%
	3 – severe limitations	149,900	22%
	4 – very severe limitations	4,400	1%
	5 – no erosion hazard, but other limitations	3,400	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	6,200	1%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	4,200	1%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	693,900	-

Assessment of Waters

Section 303(d) of the Clean Water Act states that water bodies with impaired use(s) must be placed on a state's impaired waters list. A water body is "Impaired" or polluted when it fails to meet one or more of the Federal Clean Water Act's water quality standards. Federal Standards exist for basic pollutants such as sediment, bacteria, nutrients, and mercury. The Clean Water Act requires States to identify and restore impaired waters. The primary tool for addressing impaired waters is a pollution reduction plan called a Total Maximum Daily Load, or TMDL.

2009 TMDL Listed Waters - Middle Minnesota Watershed¹⁸



Listed Lake	Impairment	Affected Use
George	Hg	Aquatic Consumption
Duck	Nutrient/Eutro	Aquatic Recreation
Loon	Hg	Aquatic Consumption
Crystal	Nutrient/Eutro	Aquatic Recreation
Hiniker Pond	Hg	Aquatic Consumption
Washington	Nutrient/Eutro, HG	Aquatic Consumption, Aquatic Recreation
George	Hg	Aquatic Consumption
Loon	Hg	Aquatic Consumption
Washington	Nutrient/Eutro, Hg	Aquatic Consumption, Aquatic Recreation
Washington	Nutrient/Eutro, Hg	Aquatic Consumption, Aquatic Recreation
Washington	Nutrient/Eutro, Hg	Aquatic Consumption, Aquatic Recreation

TMDL Listed Streams Appear Next Page

2009 TMDL Listed Waters (Continued) - Middle Minnesota Watershed¹⁸

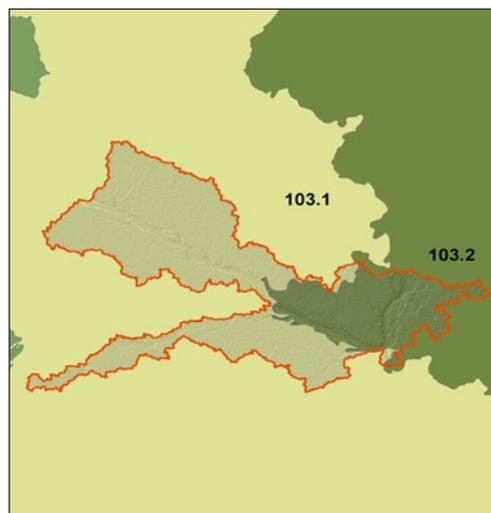
Listed Stream	Impairment	Affected Use
Minnesota River: Shahaska Cr to Rogers Cr	FC, PCB, T	Aquatic Consumption, Aquatic Life, Aquatic Recreation
Minnesota River: Blue Earth R to Shahaska Cr	PCB, T	Aquatic Consumption, Aquatic Life
Minnesota River: Cottonwood R to Little Cottonwood R	PCB, T	Aquatic Consumption, Aquatic Life
Minnesota River: Minneopa Cr to Blue Earth R	PCB	Aquatic Consumption
Minnesota River: Swan Lk outlet to Minneopa Cr	PCB, T	Aquatic Consumption, Aquatic Life
Minnesota River: Morgan Cr to Swan Lk outlet	PCB	Aquatic Consumption
Minnesota River: Little Cottonwood R to Morgan Cr	PCB	Aquatic Consumption
Minnesota River: Eightmile Cr to Cottonwood R	PCB	Aquatic Consumption, Aquatic Life
Minnesota River: Little Rock Cr to Eightmile Cr	PCB	Aquatic Consumption
Minnesota River: Spring Cr to Little Rock Cr	PCB	Aquatic Consumption
Minnesota River: Fort Ridgely Cr to Spring Cr	PCB	Aquatic Consumption
Minnesota River: Wabasha Cr to Fort Ridgely Cr	PCB	Aquatic Consumption
Minnesota River: Beaver Cr to Birch Coulee	PCB, T	Aquatic Consumption, Aquatic Life
Little Cottonwood River: Headwaters to Minnesota R	FC, T	Aquatic Life, Aquatic Recreation
County Ditch 46A: Headwaters to Sevenmile Cr	FC, T	Aquatic Life, Aquatic Recreation
Minneopa Creek: T108 R28W S23, south line to Minnesota R	T	Aquatic Life
Rogers Creek: Unnamed cr to Minnesota R	B-F	Aquatic Life
Unnamed creek: Unnamed cr to Unnamed ditch	B-F	Aquatic Life
Minnesota River: Birch Coulee to Redwood CSAH 11	PCB	Aquatic Consumption
Minnesota River: Redwood CSAH 11 to Wabasha Cr	PCB	Aquatic Consumption
Sevenmile Creek: T109 R27W S4, north line to Minnesota R	FC, T	Aquatic Life, Aquatic Recreation
Sevenmile Creek: CD 13A to CD 46A	FC, T	Aquatic Life, Aquatic Recreation
Unnamed ditch: Unnamed cr to underground pipe	FC	Aquatic Recreation
Minnesota River: Rogers Cr to Cherry Cr	PCB	Aquatic Consumption
Unnamed creek: Unnamed cr to Unnamed cr	FC	Aquatic Recreation
Unnamed creek: Headwaters to Unnamed cr	FC	Aquatic Recreation
Unnamed creek: Unnamed cr to Unnamed cr	FC	Aquatic Recreation
Unnamed creek: Headwaters to Unnamed cr	FC	Aquatic Recreation
Cottonwood River: JD 30 to Minnesota R	FC, T	Aquatic Consumption, Aquatic Life, Aquatic Recreation
Blue Earth River: Le Sueur R to Minnesota R	T	Aquatic Consumption, Aquatic Life, Aquatic Recreation
Minnesota River: Cherry Cr to Le Sueur Cr	FC, PCB	Aquatic Consumption, Aquatic Recreation

Common Resource Areas

The Middle Minnesota Watershed encompasses two common resource areas, CRAs 103.1 and 103.2 ^{/9}

103.1 Iowa and Minnesota Till Prairies: Primarily loamy glacial till soils with scattered lacustrine areas, potholes, outwash and flood plains. Nearly level to gently undulating with relatively short slopes. Most of the wet soils have been artificially drained to maximize crop production. Primary land use is cropland. Corn, soybeans, sugar beets, peas and sweet corn are the major crops. Native vegetation was dominantly tall grass prairie. Resource concerns are water and wind erosion, nutrient management, and water quality.

103.2 Iowa and Minnesota Rolling Prairie/Forest Moraines: Primarily loamy glacial till soils with some potholes, outwash and flood plains. Gently undulating to rolling with relatively short, complex slopes. Organic soils occur in the larger basins. Primary land use is cropland. Corn, soybeans, and hay are the major crops. Native vegetation was dominantly mixed tall grass prairie and deciduous trees. Resource concerns are water and wind erosion, nutrient management, water quality and wildlife habitat management.



Geology / Soils ^{/10}

The northern side of the Middle Minnesota River watershed has a gently undulating land surface formed on glacial deposits. Buried beds of sand and gravel are found at various depths within the glacial deposits and are generally thin and discontinuous. Directly underlying the glacial deposits in the western part of this region are Cretaceous sedimentary deposits of shale and sandstone. Moving in an easterly direction from Courtland to Mankato, underlying deposits shift to thick beds of Paleozoic and Precambrian shale, sandstone, and dolomite.

In the southern half of the Middle Minnesota watershed thin glacial deposits and thin discontinuous Cretaceous deposits cover Cambrian sandstone, which thickens in an eastward gradient. Deep Precambrian crystalline rocks underlie the sedimentary deposits throughout the entire watershed. (Van Voast, 1972).

According to the University of Minnesota's Department of Soil Water and Climate, the southern half of this watershed (including the Little-Cottonwood River watershed) is mainly comprised of Wetter Blue Earth till deposits. These deposits are a complex mixture of relatively flat (2-6%) well drained soils and very flat (0-2%) poorly drained soils. Soils within these deposits are generally loamy in texture. Artificial drainage to remove ponded water from flat and depressional areas is extensive.

Surficial deposits within the northern half of the watershed fall primarily within the Olivia Till Plain although some clay/silt and morainal deposits exist in the eastern corner of the watershed. The Olivia Till Plain is characterized by landscapes with moderate slopes. Slightly over half of these lands have a moderate water erosion potential. Soils are mostly loams and silt loams, with roughly two thirds being well drained and the remainder being tile drained. Roughly one fourth of the land in the Olivia Till is adjacent to streams or drainage ditches.

Visit the online Web Soil Survey at

<http://websoilsurvey.nrcs.usda.gov> for official and

 current USDA soil information as viewable maps and

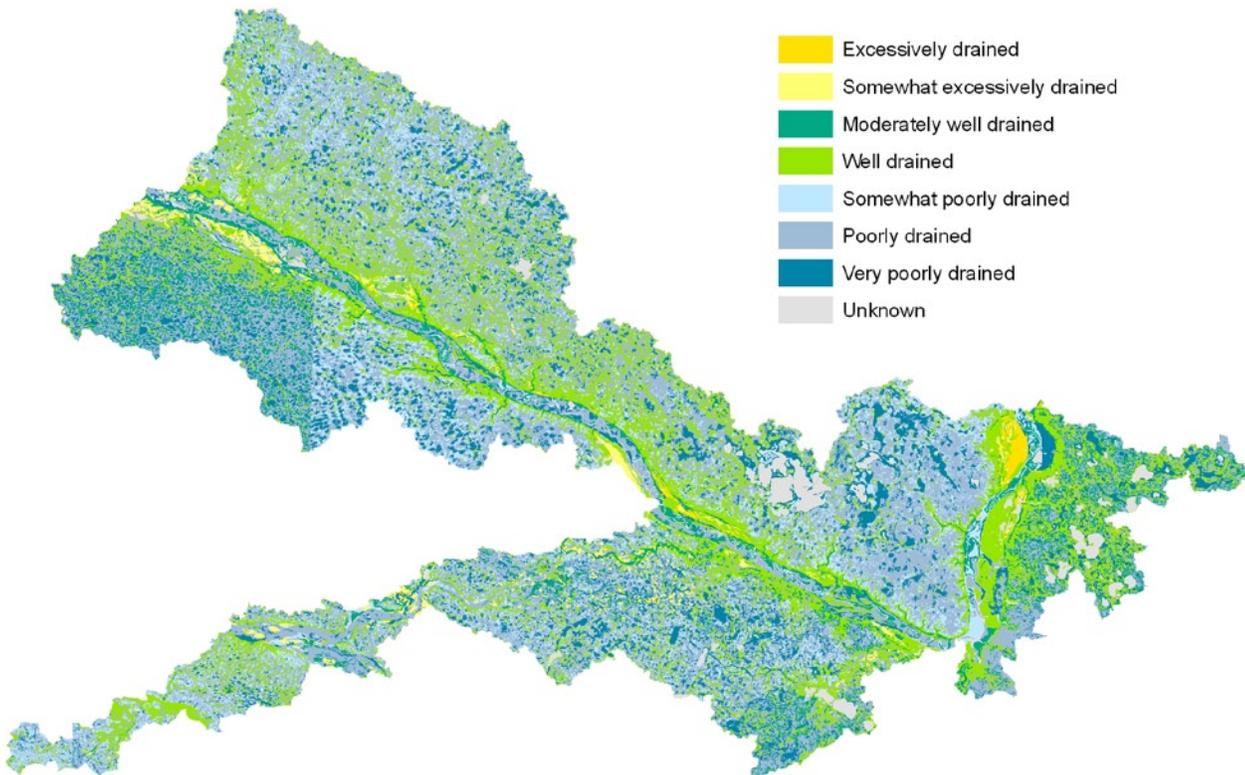
 tables. Visit the Soil Data Mart at soildatamart.usda.gov

 download SSURGO certified soil tabular /spatial data.

Drainage Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil.

Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



- Excessively drained
- Somewhat excessively drained
- Moderately well drained
- Well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Unknown

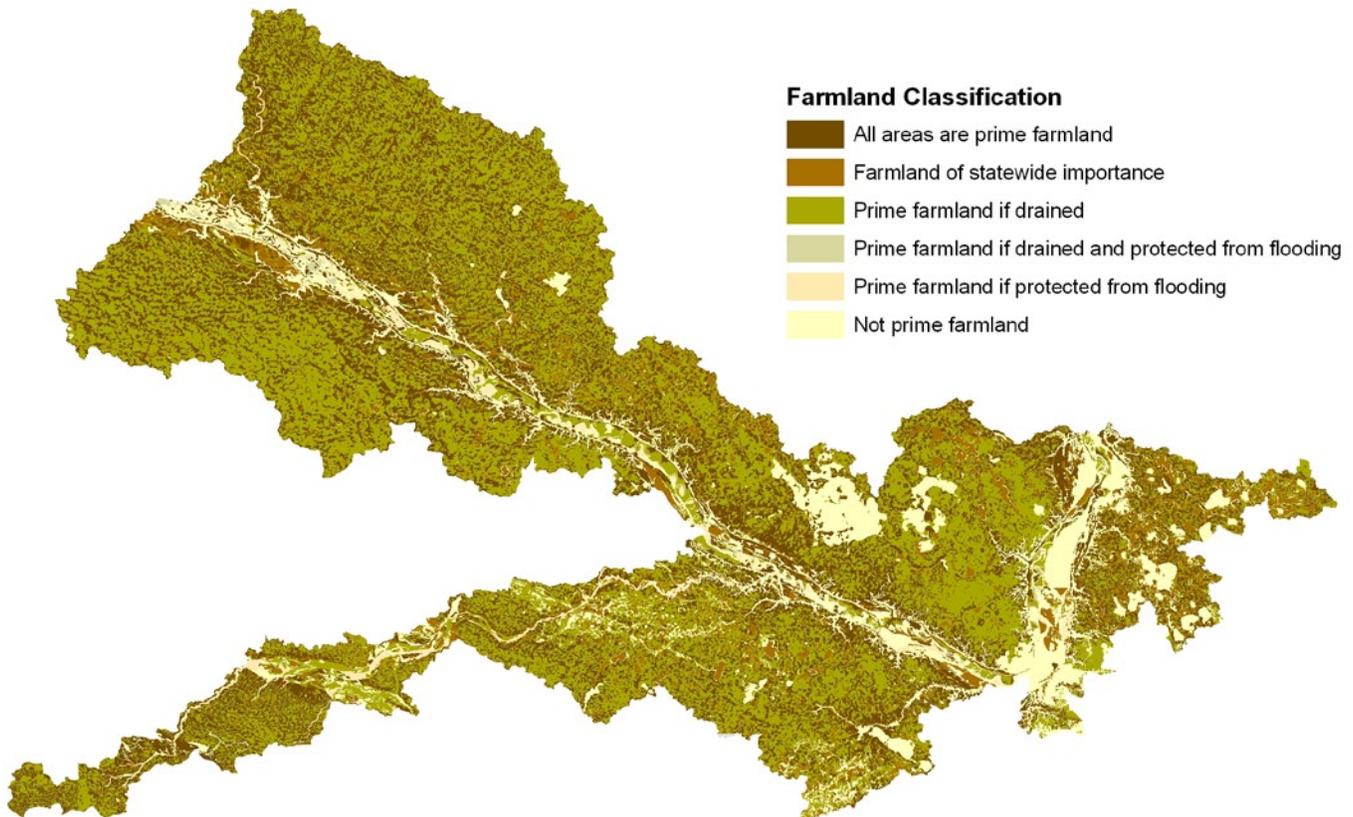
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Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland.

Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.



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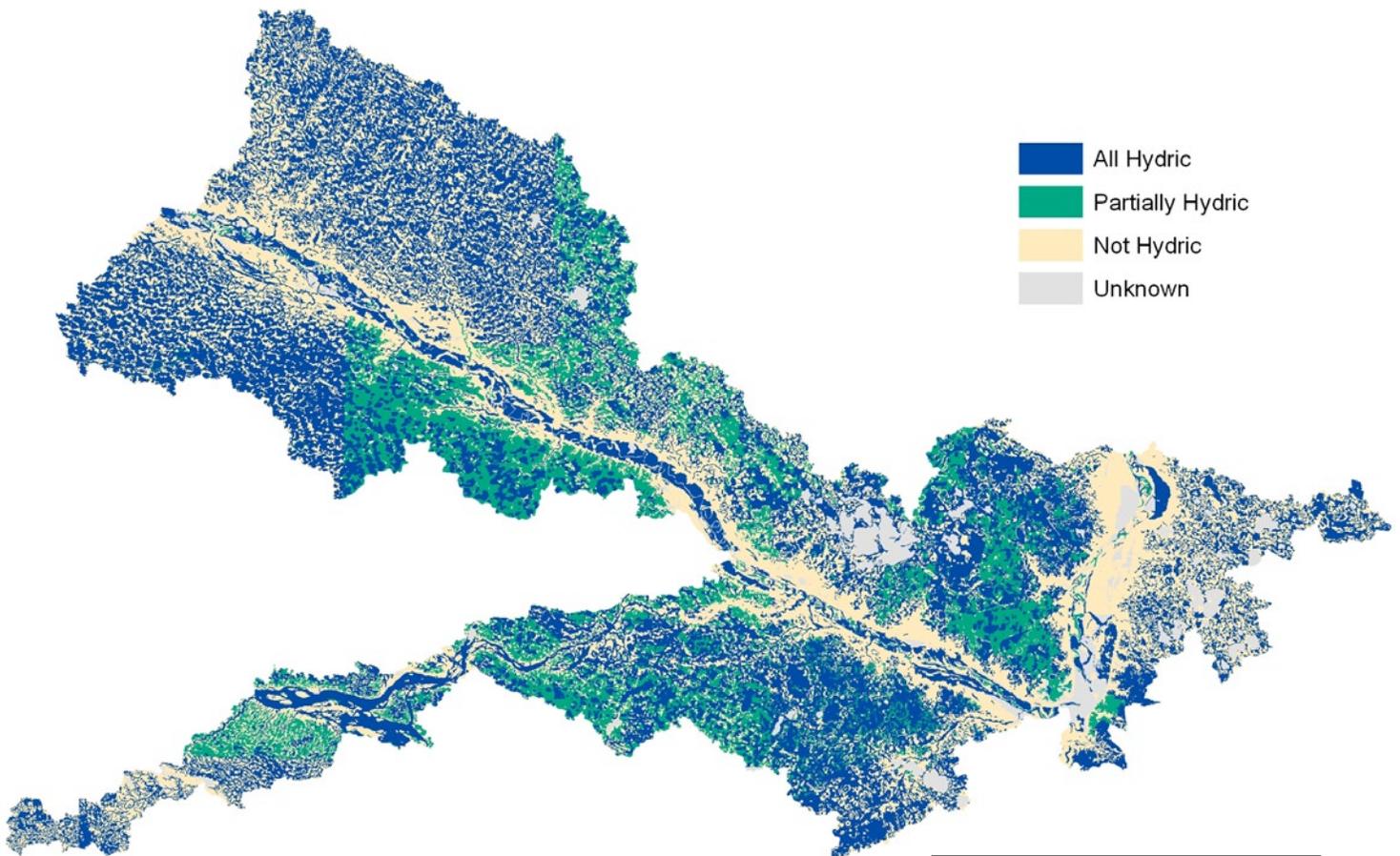
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Hydric Soils

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions of nonhydric soils in the higher positions on the landform. Map units of dominantly non-hydric soils may therefore have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.



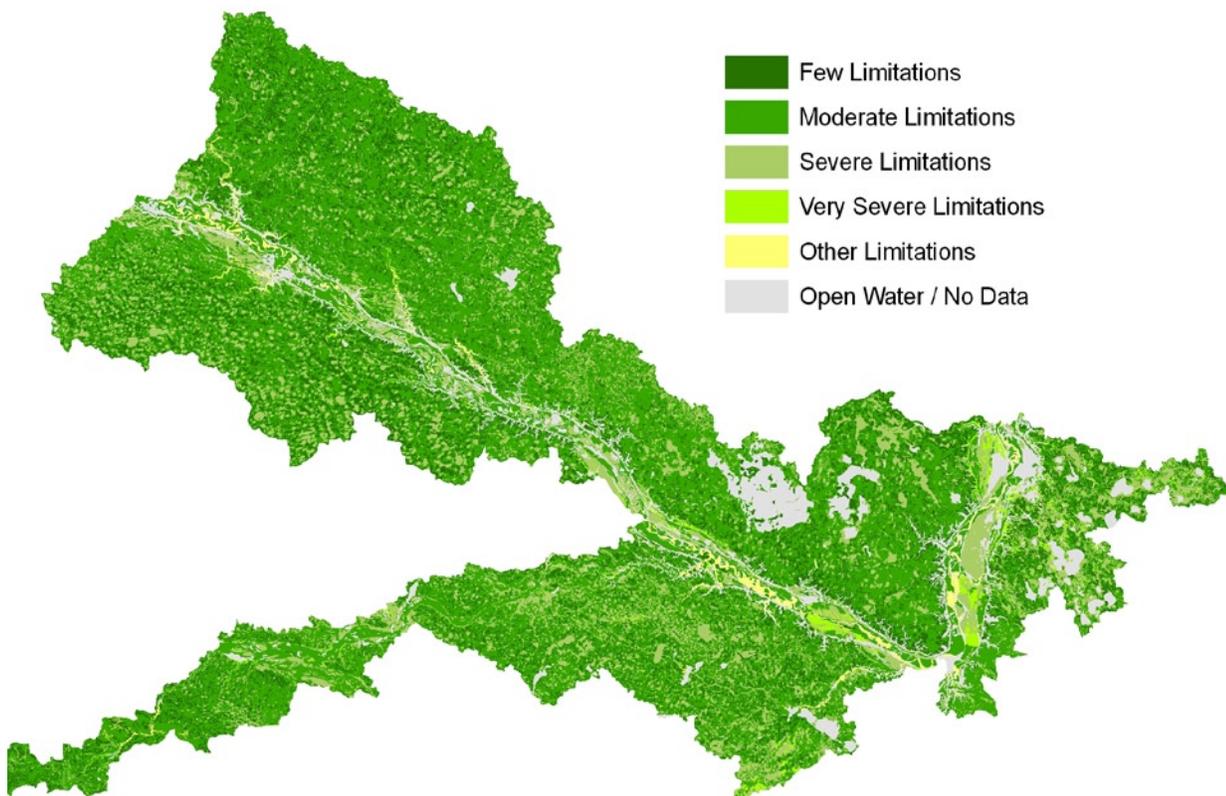
-  All Hydric
-  Partially Hydric
-  Not Hydric
-  Unknown

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Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management.

The criteria used in grouping the soils does not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



-  Few Limitations
-  Moderate Limitations
-  Severe Limitations
-  Very Severe Limitations
-  Other Limitations
-  Open Water / No Data

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Performance Results System Data

PRS Performance Measures	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	TOTALS
Total Conservation Systems Planned (acres)	3,247	2,582	0	14,235	11,348	N/A	14,544	20,032	11,797	77,785
Total Conservation Systems Applied (acres)	1,170	3,585	0	12,968	12,968	N/A	9,656	14,726	20,722	75,795
Conservation Practices										
Total Waste Management (313) (numbers)	0	1	0	0	0	0	0	0	1	2
Riparian Forest Buffers (391) (acres)	56	1,086	667	1,192	1,304	135	1	374	136	4,951
Erosion Control Total Soil Saved (tons/year)	0	25,731	37,283	55,605	63,364	N/A	N/A	N/A	N/A	181,983
Total Nutrient Management (590) (Acres)	0	173	1,246	2,441	3,882	398	2,111	2,111	4,341	16,703
Pest Management Systems Applied (595A) (Acres)	0	0	638	1,946	1,559	0	121	1,648	1,913	7,825
Prescribed Grazing 528a (acres)	0	30	0	53	0	541	0	32	32	688
Tree & Shrub Establishment (612) (acres)	0	96	113	316	374	25	38	22	45	1,029
Residue Management (329A-C) (acres)	0	2,396	1,148	1,932	3,478	3,096	3,096	6,162	2,857	24,165
Total Wildlife Habitat (644 - 645) (acres)	1,385	2,761	3,310	3,200	4,071	1,102	3,200	3,276	4,580	26,885
Total Wetlands Created, Restored, or Enhanced (acres)	7	285	804	545	1,247	767	841	816	438	5,750
Acres enrolled in Farmbill Programs										
Conservation Reserve Program	1,170	1,844	2,700	6,412	6,963	N/A	1,319	2,861	3,199	26,468
Wetlands Reserve Program	438	388	372	824	34	N/A	214	155	224	2,649
Environmental Quality Incentives Program	0	202	423	2,417	1,568	N/A	5,241	8,874	9,335	28,060
Wildlife Habitat Incentive Program	0	0	34	5	0	N/A	1	15	12	67
Farmland Protection Program	0	0	0	0	0	N/A	0	0	0	0

THREATENED AND ENDANGERED SPECIES 14

NRCS assists in the conservation of threatened and endangered species and avoids or prevents activities detrimental to such species.

NRCS' concern for these species includes the species listed by the Secretary of the Interior (as published in the Federal Register) and species designated by state agencies. The following is a list of threatened, endangered, and candidate species as well as species of special concern that occur in the subbasin.



Scientific Name	Common Name	Type	Scientific Name	Common Name	Type
<i>Acipenser fulvescens</i>	Lake Sturgeon	Zoological	<i>Huperzia porophila</i>	Rock Clubmoss	Botanical
<i>Actinonaias ligamentina</i>	Mucket	Zoological	<i>Ictiobus niger</i>	Black Buffalo	Zoological
<i>Aflexia rubranura</i>	Red Tailed Prairie Leafhopper	Zoological	<i>Lampsilis teres</i>	Yellow Sandshell	Zoological
<i>Agalinis auriculata</i>	Eared False Foxglove	Botanical	<i>Lanius ludovicianus</i>	Loggerhead Shrike	Zoological
<i>Alasmidonta marginata</i>	Elktoe	Zoological	<i>Larus pipixcan</i>	Franklin's Gull	Zoological
<i>Ammodramus henslowii</i>	Henslow's Sparrow	Zoological	<i>Lasmigona compressa</i>	Creek Heelsplitter	Zoological
<i>Apalone mutica</i>	Smooth Softshell	Zoological	<i>Lasmigona costata</i>	Fluted-shell	Zoological
<i>Arcidens confragosus</i>	Rock Pocketbook	Zoological	<i>Lespedeza leptostachya</i>	Prairie Bush Clover	Botanical
<i>Arnoglossum plantagineum</i>	Tuberous Indian-plantain	Botanical	<i>Ligumia recta</i>	Black Sandshell	Zoological
<i>Asclepias sullivantii</i>	Sullivant's Milkweed	Botanical	<i>Limosa fedoa</i>	Marbled Godwit	Zoological
<i>Atrytone arogos</i>	Arogos Skipper	Zoological	<i>Limosella aquatica</i>	Mudwort	Botanical
<i>Bacopa rotundifolia</i>	Water-hyssop	Botanical	<i>Myotis septentrionalis</i>	Northern Myotis	Zoological
<i>Buchloe dactyloides</i>	Buffalo Grass	Botanical	<i>Obovaria olivaria</i>	Hickorynut	Zoological
<i>Buellia nigra</i>	A Species of Lichen	Botanical	<i>Opuntia macrorhiza</i>	Plains Prickly Pear	Botanical
<i>Callitriche heterophylla</i>	Larger Water-starwort	Botanical	<i>Panax quinquefolius</i>	American Ginseng	Botanical
<i>Carex sterilis</i>	Sterile Sedge	Botanical	<i>Phidippus pius</i>	A Jumping Spider	Zoological
<i>Cladium mariscoides</i>	Twig-rush	Botanical	<i>Pipistrellus subflavus</i>	Eastern Pipistrelle	Zoological
<i>Coluber constrictor</i>	Eastern Racer	Zoological	<i>Pleurobema coccineum</i>	Round Pigtoe	Zoological
<i>Cycleptus elongatus</i>	Blue Sucker	Zoological	<i>Polyodon spathula</i>	Paddlefish	Zoological
<i>Cygnus buccinator</i>	Trumpeter Swan	Zoological	<i>Quadrula metanevra</i>	Monkeyface	Zoological
<i>Cyperus acuminatus</i>	Short-pointed Umbrella-sedge	Botanical	<i>Quadrula nodulata</i>	Wartyback	Zoological
<i>Cypripedium candidum</i>	Small White Lady's-slipper	Botanical	<i>Rallus elegans</i>	King Rail	Zoological
<i>Dendroica cerulea</i>	Cerulean Warbler	Zoological	<i>Rhynchospora capillacea</i>	Hair-like Beak-rush	Botanical
<i>Dryopteris goldiana</i>	Goldie's Fern	Botanical	<i>Rudbeckia triloba</i>	Three-leaved Coneflower	Botanical
<i>Eleocharis rostellata</i>	Beaked Spike-rush	Botanical	<i>Schedonnardus paniculatus</i>	Tumblegrass	Botanical
<i>Elliptio dilatata</i>	Spike	Zoological	<i>Scleria verticillata</i>	Whorled Nut-rush	Botanical
<i>Empidonax virescens</i>	Acadian Flycatcher	Zoological	<i>Seiurus motacilla</i>	Louisiana Waterthrush	Zoological
<i>Emydoidea blandingii</i>	Blanding's Turtle	Zoological	<i>Speotyto cunicularia</i>	Burrowing Owl	Zoological
<i>Eryngium yuccifolium</i>	Rattlesnake-master	Botanical	<i>Speyeria idalia</i>	Regal Fritillary	Zoological
<i>Habronattus texanus</i>	A Jumping Spider	Zoological	<i>Sterna forsteri</i>	Forster's Tern	Zoological
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Zoological	<i>Trillium nivale</i>	Snow Trillium	Botanical
<i>Hesperia dacotae</i>	Dakota Skipper	Zoological	<i>Tritogonia verrucosa</i>	Pistolgrip	Zoological

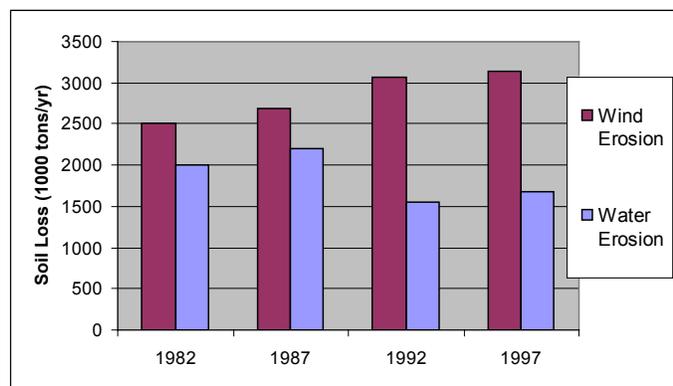
RESOURCE CONCERNS

County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Sediment and Erosion Control.** Excessive amounts of suspended solids from cropland, urban lands, streambanks and streambeds is a primary threat to area waters. Working hand-in-hand with stormwater pollution and prevention plans and nutrient management plans, counties in the watershed seek to retain water on the landscape to reduce flooding and subsequent soil erosion, and improve water resources.
- Stormwater Management.** Local districts recognize that stormwater runoff volume from impervious surfaces will likely increase as development of the watershed continues. New developments located adjacent to existing cities, near lakeshore or simply placed in a rural setting need to be tightly regulated to prevent the associated nutrient and sediment runoff impacts to our water resources.
- Drinking Water and Source Water Protection.** Parts of the region are particularly susceptible to groundwater contamination. Ease of infiltration, aging septic systems, abandoned wells and historical tiling practices threaten public drinking water supplies. Districts promote public health, economic development and community infrastructure by insuring a potable drinking water supply for all residents.
- Feedlot and Animal Waste Management.** Managing farms to minimize excess nutrients, pathogens, and odors released into the environment is important to the health of surface and ground water. Agricultural operations need to adequately maintain cropping systems to reduce nonpoint pollution, while feedlot operations need to contain their manure storage areas. Erosion and sedimentation from these operations needs to be closely monitored to reduce the levels of nutrients entering our surface water resources.
- Nutrient Management.** Excessive amounts of nutrients, namely phosphorus and nitrogen, contaminate ground and surface waters and create nuisance algae presence in area waters. Major contributors are cropland, urban grasses, municipal wastewater, aging or non-compliant septic systems, and internal cycling.
- Wetland Management.** Due to the historical draining of much of the areas wetlands and homogenic agricultural practices, priority is given to both wetland preservation and restoration. Wetlands that have been filled and drained retain their characteristic soil and hydrology, often allowing their natural functions to be reclaimed. Restoration is a complex process requiring planning, implementation, monitoring, and management.
- Drainage Management.** The Area's agricultural dominance, coupled with vast surface water resources has resulted in a "tug of war" between the need for cropping systems and desire for suitable water recreation. To enhance crop production, tiling systems have been improved wetlands have been drained, causing drainage systems to be inundated with increased volumes of nutrient rich water. These fast flowing systems need to be addressed now - priority issues include potential storage areas, wetland restoration and effective management of the current drainage system program.

NRI Soil Loss Estimates¹³

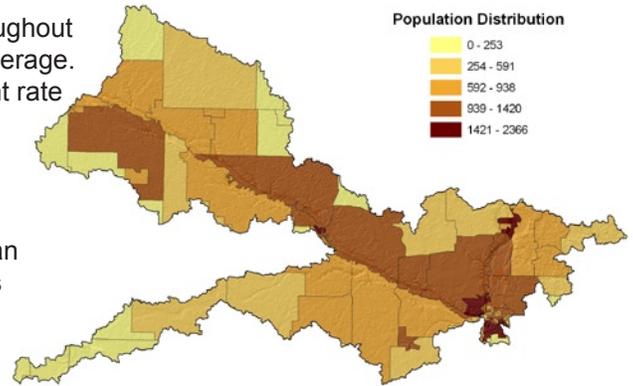
- NRI estimates for sheet and rill erosion by water on the cropland and pastureland **decreased** by approximately 328,800 tons of soil between 1982 and 1997 (16%).
- NRI estimates indicate wind erosion rates **increased** by 636,900 tons (25%) between 1982 and 1997.



Socioeconomic and Agricultural Data (Relevant)

Estimations for the subbasin indicate a current population of approximately 88,010 people. Median household income throughout the district is \$42,066 annually, roughly 91% of the national average. Unemployment figures for the basin indicate an unemployment rate of 4.2 percent, and approximately 9% of the residents in the watershed are living below the national poverty level.

Assessment estimates indicate 2,043 farms in the watershed. Approximately thirty one percent of the operations are less than 180 acres in size, fifty one percent are from 180 to 1000 acres in size, and the remaining farms are greater than 1000 acres. Of the 2,171 operators in the basin, seventy four percent are full time producers not reliant on off-farm income.



(MN) HUC# 7020007		Total Acres:	861,886
Population Data*	Watershed Population	88,010	
	Unemployment Rate	4.2%	
	Median Household Income	42,066	
	% below poverty level	9%	
	Median Value of Home	81,233	
Farm Data	# of Farms	2,043	
	# of Operators	2,171	Percent
	# of Full Time Operators	1,606	74%
	# of Part Time Operators	564	26%
	Total Cropland Acres	718,209	83.3%
Farm Size	1 to 49 Acres	319	20%
	50 to 179 Acres	335	21%
	180 to 499 Acres	520	33%
	500 to 999 Acres	289	18%
	1,000 Acres or more	136	8%
	Average Farm Size	89	
Livestock & Poultry	Cattle - Beef	4,029	0.5%
	Cattle - Dairy	8,839	1.0%
	Chicken	5,667	0.6%
	Swine	502,812	57%
	Turkey	351,574	40%
	Other	5,511	0.6%
	Animal Count Total:	878,432	
	Total Permitted AFOs:	939	
Chemicals (Acres Applied)	Insecticides	44,956	
	Herbicides	374,762	
	Wormicides	8,939	
	Fruiticides	720	
	Total Acres Treated	429,377	
	% State Chemical Totals	3.0%	

* Adjusted by percent of HUC in the county or by percent of block group area in the HUC, depending on the level of data available

Watershed Projects, Plans and Monitoring

- **Blue Earth River TMDL Project,**
Minnesota Pollution Control Agency
- **Brown- Nicollet-Cottonwood CWP P I & II**
Brown-Nicollet-Cottonwood Water Quality Board
- **Lake Ballantyne Lake Assessment Program**
Minnesota Pollution Control Agency
- **Crystal Loon Mills Lakes CWP-Phase I**
Blue Earth County
- **Duck Lake CWP-Phase I&II**
Blue Earth County
- **Little Cottonwood River CWP-Phase I and EQIP Prog Watershed Priority area**
Redwood / Cottonwood Control Area
- **Lake Crystal Lake Assessment Program**
Blackdog Water Management Commission
- **Lake Washington-CWP Phase I & II**
Le Sueur and Blue Earth County Joint Powers Board
- **Minnesota River Turbidity TMDL Work Plan**
Minnesota Pollution Control Agency.
- **MRAP Biological & Toxicological Assessment**
Minnesota Pollution Control Agency
- **MRAP Land Use Assessment LevelsIII,IV**
Minnesota Pollution Control Agency
- **South Central MN Comprehensive County Water Planning Project,**
Minnesota River Basin Joint Powers Board

* Have a watershed project you'd like to see included? Submit suggestions online @ <http://www.mn.nrcs.usda.gov/technical/rwa/>

Conservation Districts, Organizations & Partners

- **Area II Minnesota River Basin Projects, Inc**
1400 E Lyon Street, Bx 267 Marshall, MN 56258
Phone 507-537-6369 Fax 507-537-6368
- **Black Dog Water Management Commission**
100 Civic Center Pkwy, Burnsville, MN 55337
Phone 952-895-4505
- **Blue Earth Co. Soil & Water Conservation District**
1160 Victory Dr #3 Mankato, MN 56001-5307
Phone 507-345-4744
- **Brown Co. Soil & Water Conservation District**
184 Trafton Science Center S, Mankato, MN 56001
Phone 507-389-5492 Fax 507-389-5493
- **Brown-Nicollet-Cottonwood Water Quality Board**
322 South Minnesota Avenue. St. Peter, MN 56082.
Phone: 507-934-4140
- **Cottonwood Co. Soil & Water Conservation District**
339 9th St, Windom, MN 56101
Phone (507) 831-1153
- **Le Sueur Co. Soil & Water Conservation District**
181 W. Minnesota St. Le Center, MN 56057
Phone 507-357-4879
- **Mid-Lower Minnesota River CWP**
520 Lafayette Rd. St. Paul, MN 55155
Phone 612-282-5559
- **Minnesota River Basin Joint Powers Board**
600 E. 4th St Chaska, MN 55318-2108
Phone 952-361-6590 Fax 952-361-6594
- **Nicollet Co. Soil & Water Conservation District**
501 South Minnesota Avenue St. Peter, MN 56082
Phone 507- 931-6800
- **Redwood Soil & Water Conservation District**
1241 E Bridge Street Redwood Falls, MN 56283
Phone 507-637-2427 ext. 3 Fax 507-637-8136
- **Renville Soil & Water Conservation District**
1008 W Lincoln Olivia, MN 56277
Phone 320-523-1553 ext. 3 Fax 320-523-2389
- **South Central Comprehensive Water Plan Joint Powers Board** P.O. Box 248, New Ulm, MN 56073 Phone 507-233-6642
- **Sibley Co. Soil & Water Conservation District**
111 6th Street, PO Box 161, Gaylord, MN 55334
Phone -507-237-5435 Ext. 103
- **Prairie Country RC&D**
1005 High Avenue NE Willmar, MN 56201-4817
Phone 320-231-0008 Fax 320-235-8151
- **Watsonwan Co. Soil & Water Conservation Dist**
823 1st AVE. S., Suite 2 St. James, MN 56081
Phone 507-375-3104

Footnotes / Bibliography

1. Ownership Layer – Source: MN Stewardship Data: Minnesota Department of Natural Resources, Section of Wildlife, BRW, Inc, 2008. This is the complete GAP Stewardship database containing land ownership information for the entire state of Minnesota. Date of source material is variable and ranges from 1976 to 2007, although a date range of 1983 to 1985 predominates. Land interest is expressed only when some organization owns or administers more than 50% of a forty except where DNR could create sub-forty accuracy polygons.
2. National Land Cover Dataset (NLCD) - Originator: U.S. Geological Survey (USGS); Publication date: 20010631; Title: Minnesota Land Cover Data Set, Edition: 1; Geospatial data presentation form: Raster digital data; Publisher: U.S. Geological Survey, Sioux Falls, SD, USA.
3. Ownership layer classes grouped to calculate Public ownership vs. Private and Tribal ownership by Minnesota NRCS Rapid Watershed Assessment Staff. Land cover / Land use data was then extracted from the National Landcover Dataset Classification System and related to ownership class polygons.
4. U.S. Geological Survey National Hydrography Dataset (NHD) 1:24,000-scale Digital Line Graph (DLG) high resolution hydrography data, integrated with reach-related information from the U.S. Environmental Protection Agency Reach File Version 3.0 (RF3). The Hydro 24k layer was compared to MPCA's 303(d) data to derive percentage of listed waters.
5. Land Cover / Land Use / Hydro 24k Buffer. Using the 24k Hydrology dataset, All streams within HUC were spatially buffered to a distance of 100 ft. National Landcover Dataset attributes were extracted for the spatial buffer to demonstrate the vegetation and landuse in vulnerable areas adjacent to waterways.
6. Land Capability Class. ESTIMATES FROM THE 1997 NRI DATABASE (REVISED DECEMBER 2000) REPLACE ALL PREVIOUS REPORTS AND ESTIMATES. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is because of changes in statistical estimation protocols and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. All definitions are available in the glossary. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: <http://www.nrcs.usda.gov/technical/NRI/>
7. 1997 NRI Irrigated Land Estimates. Irrigated land: Land that shows evidence of being irrigated during the year of the inventory or during two or more years out of the last four years. Water is supplied to crops by ditches, pipes, or other conduits. Water spreading is not considered irrigation; it is recorded as a conservation practice. [NRI-97] For more information: <http://www.nrcs.usda.gov/technical/NRI/>
8. 303(d) Stream data. Minnesota's Final Impaired Waters (per Section 303(d) Clean Water Act), 2009. Data obtained from Minnesota Pollution Control Agency (MPCA). The Minnesota Pollution Control Agency (MPCA) helps protect state water by monitoring quality, setting standards and controlling inputs through the development of TMDL plans. <http://www.pca.state.mn.us/water/tmdl/index.html#maps>.

Footnotes / Bibliography (continued)

9. National Coordinated Common Resource Area (CRA) Geographic Database. A Common Resource Area (CRA) map delineation is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area

10. Soil Survey Geographic Database (SSURGO) Tabular and spatial data obtained from NRCS Soil Data Mart at <http://soildatamart.nrcs.gov>. Publication dates vary by county. Component and layer tables were linked to the spatial data via SDV 5.1 and ARCGIS 9.1 to derive the soil classifications presented in these examples. Highly Erodible Land Classification Data obtained from USDA/NRCS EFOTG Section II, County Soil Data. HEL classifications were appended to SSURGO spatial data via an ARCEdit session. Addendum and publication dates vary by county.

11. Lands removed from production through farm bill programs. County enrollment derived from the following: CRP Acres: www.fsa.usda.gov/crpstorpt/07Approved/r1sumyr/mn.htm (7/30/07). CREP Acres: <http://www.bwsr.state.mn.us/easements/crep/easementssummary.html> (7/31/08). WRP Acres: NRCS (8/16/08). Data were obtained by county and adjusted by percent of HUC in the county.

12. Socioeconomic and Agricultural Census Data were taken from the U.S. Population Census, 2000 and 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of zip code area in the HUC, depending on the level of data available. Data were also taken from MPCA AFO/CAFO counts provided by county for 2005.

13. 1997 NRI Estimates for sheet and rill erosion (WEQ & USLE). The NRI estimates sheet and rill erosion together using the Universal Soil Loss Equation (USLE). The Revised Universal Soil Loss Equation (RUSLE) was not used in the 1997 NRI. RUSLE was not available for previous inventories, therefore the use of USLE was continued to preserve the trending capacity of the NRI database. Wind erosion is estimated using the Wind Erosion Equation (WEQ). For further information visit <http://www.mn.nrcs.usda.gov/technical/nri/findings/erosion.htm>

14. Federally listed endangered and threatened species counts obtained from NRCS Field Office Technical Guide, Section II, Threatened and Endangered List. <http://www.nrcs.usda.gov/Technical/efotg/>. Where listed, Essential fish habitat as established by Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended through October 11, 1996 <http://www.nmfs.noaa.gov/sfa/magact/>

15. Watershed Projects, Plans, Monitoring. Natural Resources Conservation Service, Watershed Projects Planned and Authorized, <http://www.nrcs.usda.gov/programs/watershed/Purpose>. Additional Information on listed individual projects can be obtained from the noted parties.