

**Rapid Watershed Assessment**  
**Resource Profile**  
**Cottonwood (MN) HUC: 7020008**



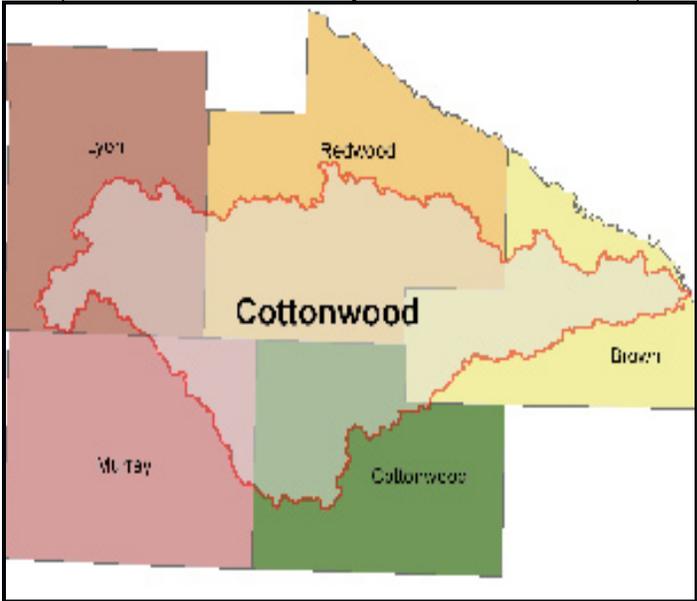
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best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

**Introduction**

The Cottonwood 8-digit Hydrological Unit Code (HUC) Subbasin is located in the Prairie Parkland Ecological Province of Southwestern Minnesota. This largely agricultural watershed is 840,193 acres in size. Approximately ninety seven percent of the land within the subbasin is held by private land owners, with the remainder belonging to a variety of public entities.

There are 1,837 farms in the subbasin. About 40 percent of the operations are less than 180 acres in size, over 60 percent are 180 to 1,000 acres in size, and the remaining farms are more than 1,000 acres in size. Most of the producers are full time operators and do not rely on off-farm income.

The main resource concerns on the cropland are wind and water erosion control, drainage management, and erosion and sediment control. Additional concerns include residue management, nutrient management, groundwater and surface water protection (Nitrogen, Phosphorous, Mercury, Turbidity, and Fecal Coliform).



**County Totals**

<i>County</i>	<i>Acres in HUC</i>	<i>% HUC Acres</i>
Brown	173,950.1	20.7
Cottonwood	157,045.6	18.7
Lyon	147,546.8	17.6
Murray	63,701.7	7.6
Redwood	297,948.6	35.5
<b>Total acres:</b>	<b>840,175.0</b>	<b>100</b>

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## Physical Description

This once glaciated area is part of the Prairie Pothole Region. Thick glacial deposits cover almost the entire watershed and are predominantly till. Beds of sand and gravel exist within the till and are often used for aquifers in the watershed.

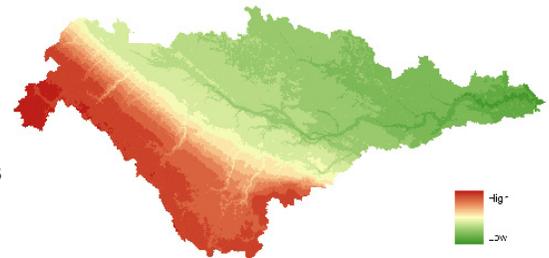
Average elevation is 1205 feet above sea level. The highest values occur in the Western and Southwestern portions of the watershed, while values are progressively lower approaching Eastern regions.

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 (80.8%), followed by grass and pasture (12.4%), and forest (2.6%).

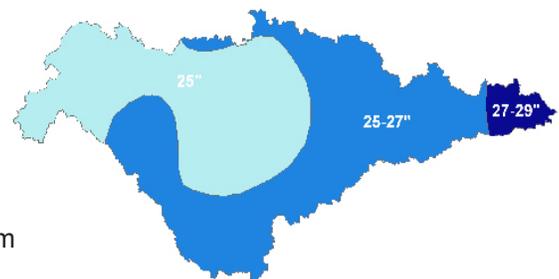
Land use within the watershed is primarily agricultural, accounting for approximately 84% of the available acres. Corn and soybeans are grown on approximately 92% of cropland. Small grains, hay, and grasslands enrolled in the Conservation Reserve Program (CRP) make up the majority of the balance.

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

### Relief

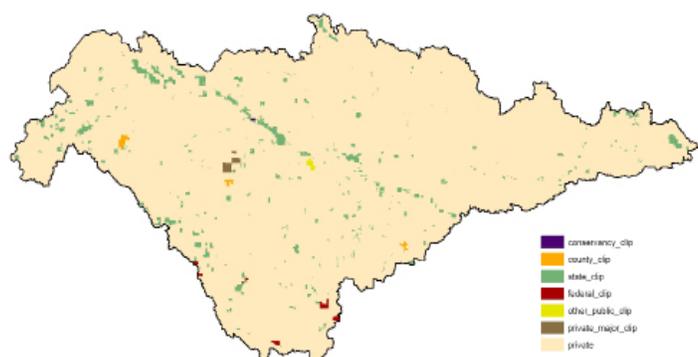


### Average Precipitation (inches)



## Ownership\*

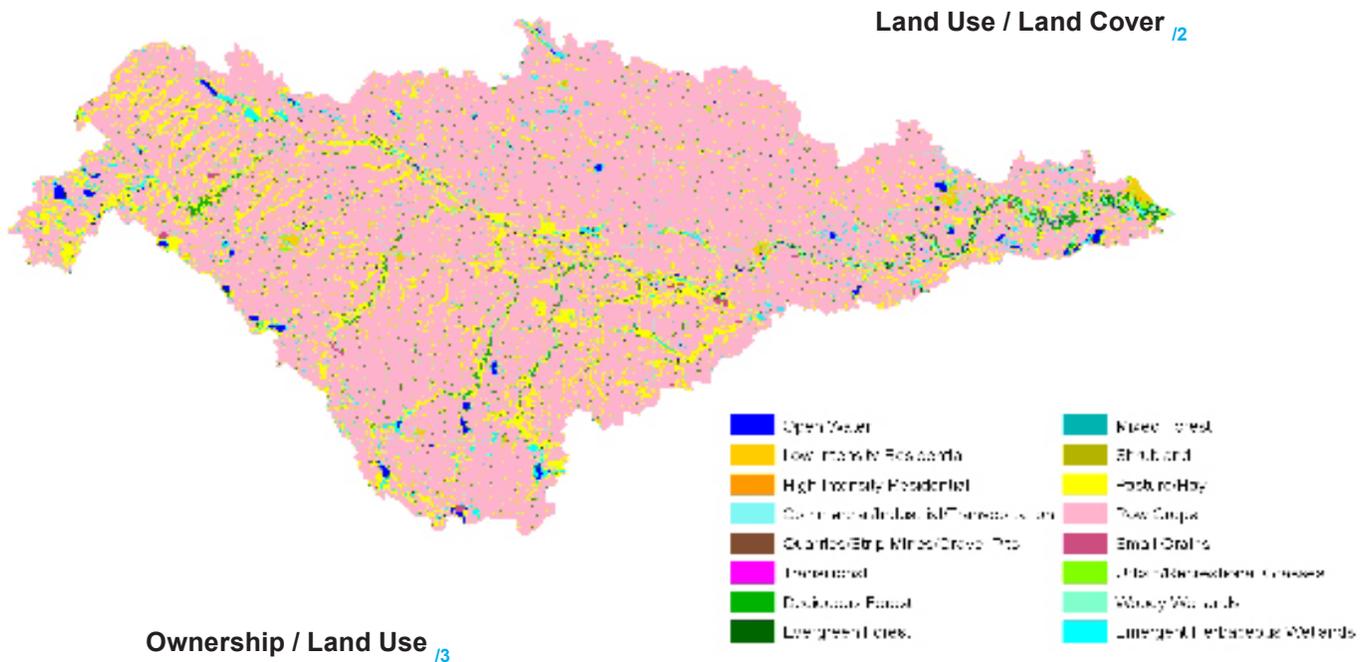
Ownership Type	Acres	% of HUC
Conservancy	80.9	0.01%
County	1,215.0	0.14%
Federal	1,167.0	0.14%
Private Major	1,041.6	0.12%
State-Misc.	23,647.5	2.81%
Other Public	445.7	0.05%
Tribal	0.0	0.00%
Private	812,597.1	96.72%
<b>Ownership Totals:</b>	<b>840,195</b>	<b>100.00%</b>



\* Ownership totals derived from 2007 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 Cottonwood Watershed covers an area of 840,175 acres. Approximately ninety seven percent of the land in the watershed is owned by private landholders (812,597 acres). The second largest ownership type is State, with just under 23,650 acres (2.81%), followed by County with 1,215 acres (0.14%), Federal with 1,167 acres (0.14%), Private Major with 1041 acres (0.12%), and Other Public lands amounting to 446 acres (0.05%). Conservancy lands account for the smallest ownership percentage, covering just over 80 acres (0.01%). Data indicates no tribally owned or managed lands in the HUC. Land use by ownership type is represented in the table below.



## Ownership / Land Use <sup>/3</sup>

Landcover/Use	Public		Private		Tribal		Total Acres	Percent
	Acres	Percent	Acres	Percent	Acres	Percent		
Forest	1,437.0	5.43	20,342.39	2.42	0	0.00	21779.35	2.59%
Grain Crops	342.1	1.29	1,167.70	0.14	0	0.00	1509.84	0.18%
Grass, etc	6,758.9	25.54	97,384.80	11.59	0	0.00	104143.72	12.40%
Orchards	0.0	0.00	0.00	0.00	0	0.00	0.00	0.00%
Row Crops	12,052.8	45.54	667,216.20	79.41	0	0.00	679269.03	80.85%
Shrub etc	60.0	0.23	1,020.41	0.12	0	0.00	1080.39	0.13%
Wetlands	4,697.6	17.75	15,209.87	1.81	0	0.00	19907.45	2.37%
Residential/Commercial	40.2	0.15	6,342.94	0.75	0	0.00	6383.18	0.76%
Open Water*	1077.0	4.07	5045.78	0.60	0	0.00	6122.75	0.73%
* ownership undetermined								
<b>Totals:</b>	<b>26,465.62</b>	<b>3.15%</b>	<b>813,730</b>	<b>96.85%</b>	<b>0</b>	<b>0.00</b>	<b>840,174.6</b>	<b>100.00%</b>

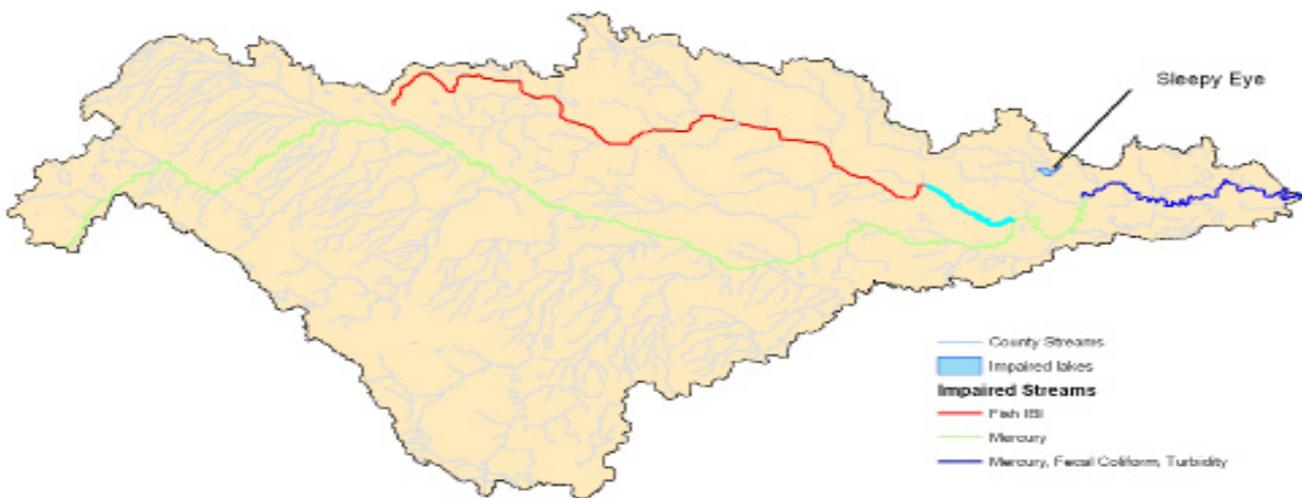
**Physical Description (continued)**

		cu. ft/sec		
<b>Stream Flow Data</b>	USGS 05317000 COTTONWOOD RIVER NEAR NEW ULM, MN	<b>Total Avg.</b>	355.6	
		<b>May – Sept. Yield</b>	396.8	
		<b>ACRES/MILES</b>	<b>PERCENT</b>	
<b>Stream Data<sup>4</sup></b> (*Percent of Total HUC Stream Miles)	Total Miles – Major (100K Hydro GIS Layer)	1,538	---	
	Total Miles – 303d/TMDL Listed Streams	194	13%*	
<b>Riparian Land Cover/Land Use<sup>5</sup></b> (Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)	Dev/Barren	16,388	44%	
	Fallow	0	0%	
	Forest	11,960	32%	
	Grain Crops	3,394	9%	
	Grass/Pasture	3,512	9%	
	Orchards/Vine	1,489	4%	
	Row Crops	106	0.3%	
	Shrub/Range	199	0.5%	
	Water	23	0.1%	
	<b>Total Buffer Acres</b>	<b>37,071</b>	---	
<b>Crop and Pastureland Land Capability Class<sup>6</sup></b> (Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)	<b>1</b> – slight limitations	116,900	16%	
	<b>2</b> – moderate limitations	433,400	59%	
	<b>3</b> – severe limitations	127,400	17%	
	<b>4</b> – very severe limitations	34,000	5%	
	<b>5</b> – no erosion hazard, but other limitations	9,200	1%	
	<b>6</b> – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	900	0%	
	<b>7</b> – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	8,700	1%	
	<b>8</b> – miscellaneous areas; limited to recreation, wildlife habitat, water supply	200	0%	
	<b>Total Crop &amp; Pastureland</b>	<b>730,700</b>	---	
<b>Irrigated Lands<sup>7</sup></b> (1997 NRI Estimates for Non-Federal Lands Only)	<b>TYPE OF LAND</b>	<b>ACRES</b>	<b>% of Irrigated Lands</b>	<b>% of HUC</b>
	Cultivated Cropland	0	0%	0%
	Uncultivated Cropland	0	0%	0%
	Pastureland	0	0%	0%
	<b>Total Irrigated Lands</b>	<b>0</b>	<b>0%</b>	<b>0%</b>

## 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 the Minnesota Pollution Control Agency (MPCA) to identify and restore impaired waters.

Minnesota’s impaired waters list, updated every two years, identifies assessed waters that do not meet water quality standards. The primary tool for addressing impaired waters is a pollution reduction plan called a Total Maximum Daily Load, or TMDL. After impaired use(s) have been identified, the TMDL process identifies all sources of each pollutant. The plan then determines how much each source must reduce it’s contribution in order to meet the applicable water quality standard. The Clean Water Act requires a completed TMDL for each water quality violation identified on a state’s impaired waters list. Lakes or river reaches with multiple impairments require multiple TMDLs.



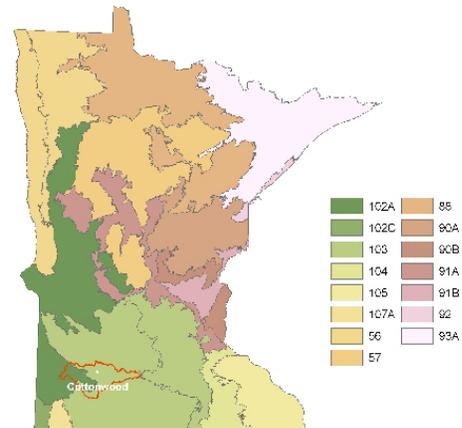
Listed Stream <sup>18</sup>	Impairment	Affected Use
Cottonwood River; JD #30 to Minnesota R	Mercury, Fecal Coliform, Turbidity	Aquatic Life, Aquatic Recreation, Aquatic Consumption
Cottonwood River; Headwaters to Meadow Cr	Mercury	Aquatic Consumption
Cottonwood River; Meadow Cr to Plum Cr	Mercury	Aquatic Consumption
Cottonwood River; Plum Cr to Dutch Charlie Cr	Mercury	Aquatic Consumption
Cottonwood River; Dry Cr to Mound Cr	Mercury	Aquatic Consumption
Cottonwood River; Mound Cr to Coal Mine Cr	Mercury	Aquatic Consumption
Sleepy Eye Creek; Headwaters to Cottonwood R	Fish IBI	Aquatic Life
Listed Lake	Impairment	Affected Use
Sleepy Eye	Excess Nutrients	Aquatic Recreation

## Common Resource Areas

The Cottonwood Watershed is located within two common resource areas, CRA 102A.1, and 103. <sup>/9</sup>

**102A.1 - Rolling Till Prairie:** Gently sloping to steep, loamy glacial till soils with scattered sandy outwash soils and silty alluvial flood plains soils. This area is part of the Prairie Pothole region of the upper Midwest. Predominantly cropped to corn and soybeans with increasing hayland and pasture and small grains in the Western part. Resource concerns are water and wind erosion, nutrient management and water quality.

**103 – 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.



Only the major CRA units are described above.  
 For further information, go to:  
<http://soils.usda.gov/survey/geography/cra.html>

## Soils / Geology <sup>/10</sup>

Headwaters of the Cottonwood are in the marshes of Rock Lake, in southwestern Lyon County, from which the river wanders on Coteau des Prairies for about twenty miles as an intermittent stream. Characterized by landscapes with long northeast facing slopes of moderate steepness, the majority of the Coteau (72%) is classified as having a high water erosion potential. Its well drained, loamy southwestern side sheds water into the Big Sioux River while on the other side of the divide, waters flow across well drained loamy soils and into the Des Moines and Minnesota rivers.

Above Amiret, the Cottonwood, still a very small stream, plunges through a deep, wooded valley and drops 200 feet off the highlands over a distance of approximately five miles. Turning southeast, the river flows along the base of the Coteau’s moraines and receives many small tributaries and intermittent streams that also come down the highland’s slope. Leaving the base of the Coteau, the Cottonwood enters the Blue Earth Till Plain of the Western Cornbelt Ecoregion.

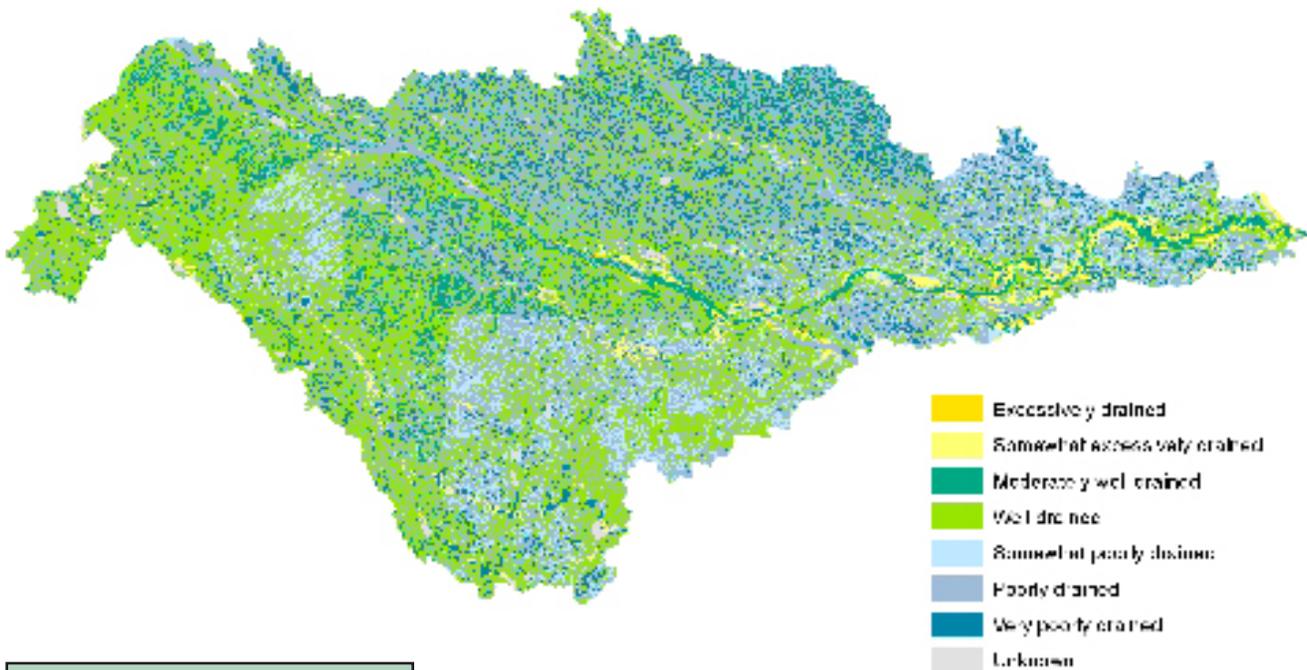
The River then flows east, enters the Minnesota River Valley and flows through a heavily wooded valley to its mouth at New Ulm. Lands within this section of the Blue Earth Till Plain are characterized as a complex mixture of gently sloping (2-6%) well drained loamy soils and nearly level (0-2%) poorly drained loamy soils. Artificial drainage to remove ponded water from flat and depressional areas is extensive. Water erosion potentials are moderate on much of these lands (46%).

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 <http://soildatamart.usda.gov> to download SSURGO certified soil tabular and 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.”



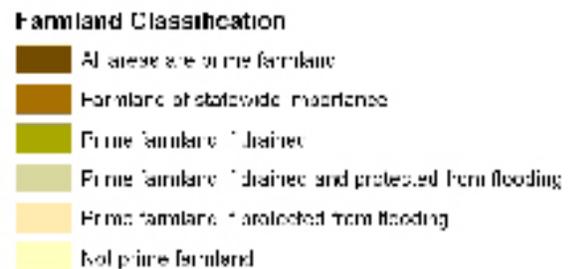
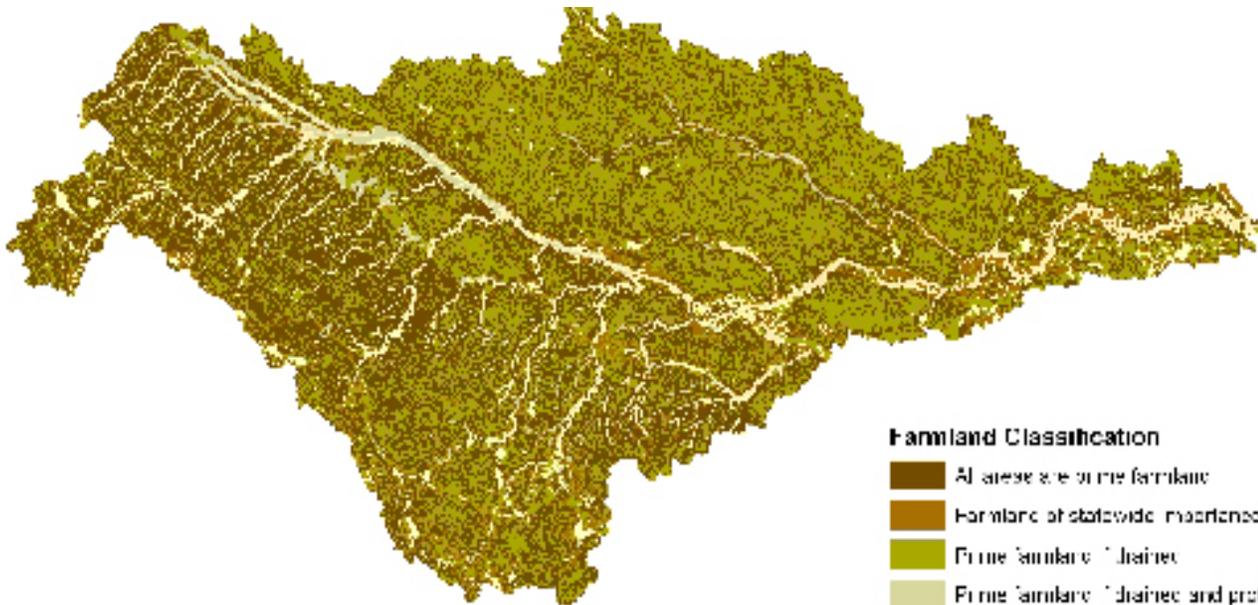
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## Farmland Classification

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.



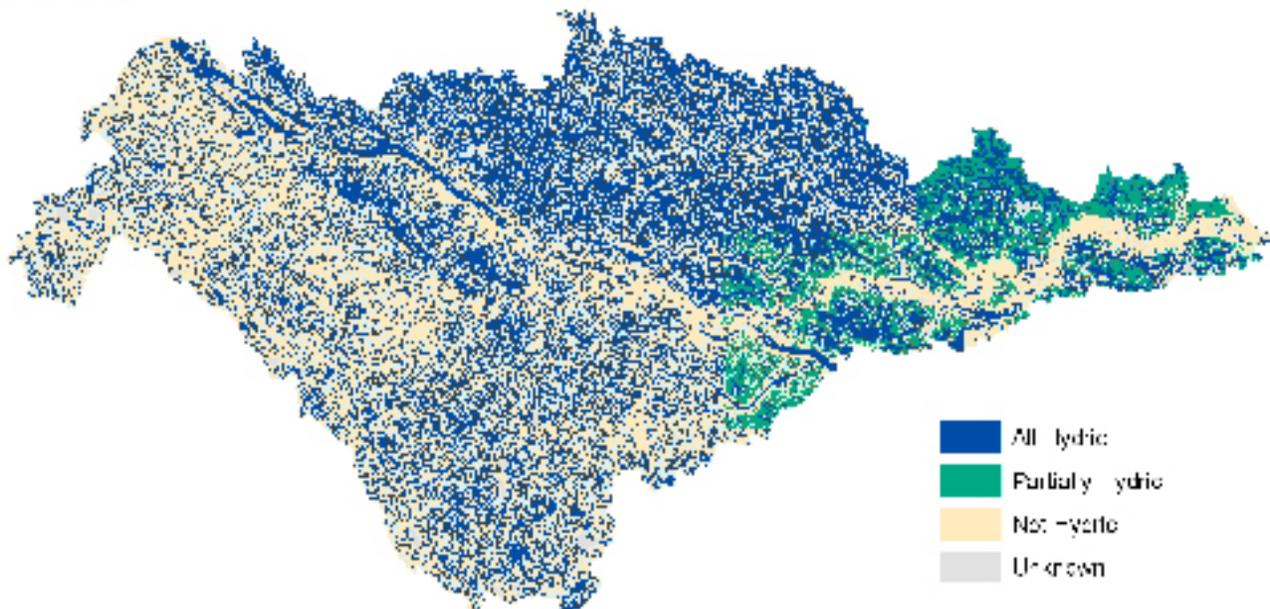
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## Hydric Soils

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.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field.



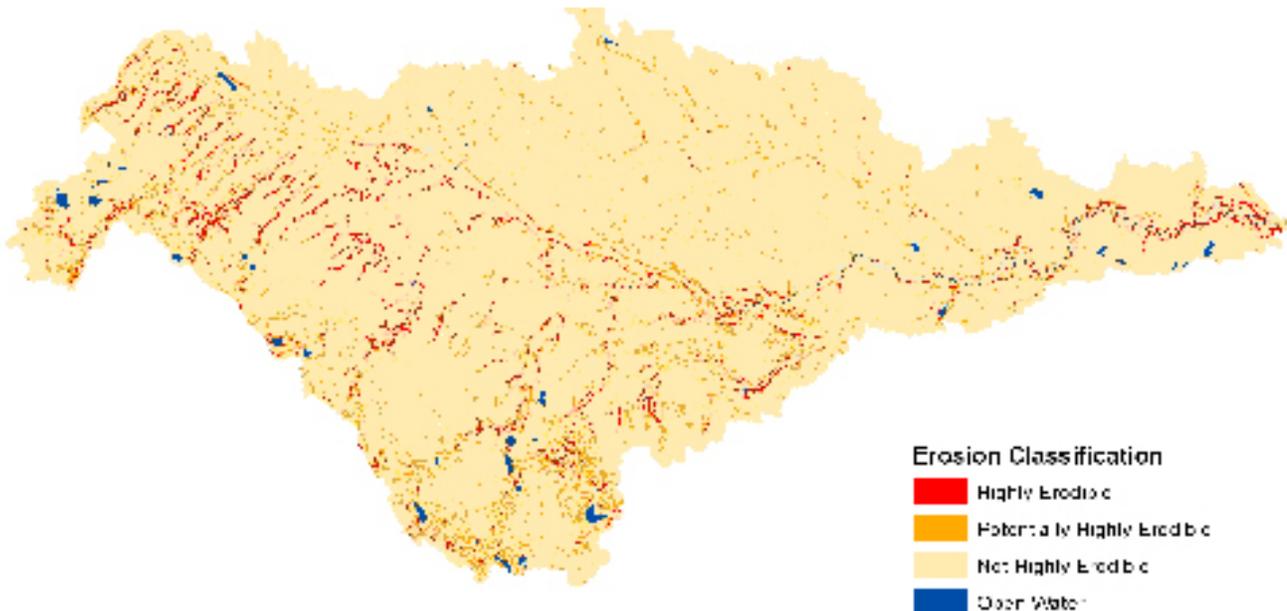
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## Highly Erodible Land (HEL)

The erodibility index (EI) for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the FOTG as of January 1, 1990.

A soil map unit with an EI of 8 or greater is considered to be highly erodible land (HEL).

Potential erodibility is based on default values for rainfall amount and intensity, percent and length of slope, surface texture and organic matter, permeability, and plant cover. Actual erodibility and EI for any specific map unit depends on the actual values for these properties.



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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.



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## Performance Results System and Other Data

NRCS Conservation treatment practices applied or prescribed within the Cottonwood watershed in the three year reporting period have primarily concentrated on Conservation tillage (6,794 Acres/yr avg.), Nutrient management (3,780 Acres/yr), Erosion control (2,171 Acres/yr), and Conservation crop rotations (2,099 Acres/yr). Other notable efforts have been made in areas of air quality/ wind erosion management, with an average of nearly 19,000 feet of windbreak added annually.

Conservation Treatment Acres	NRCS Practice Code	FY 04	FY 05	FY 06	Avg/Yr	Total
Waste Management (Number)	313, 317, 359	0	1	1	1	2
Buffers (Acres)	391, 393	304	243	250	266	797
Erosion Control (Acres)	311, 332, 589, 386, 412, 600, 601, 603, 380, 650	272	6,203	37	2171	6512
Irrigation Water Management (Acres)	449	0	0	0	0	0
Wind Break (ft)	380	23,844	16,292	16235	18790	56371
Atmospheric Resource Quality Management (Acres)	370	0	0	0	0	0
Nutrient Management (Acres)	590	2,511	5,216	3613	3780	11340
Pest Management (Acres)	595	614	1,727	3899	2080	6240
Prescribed Grazing (Acres)	528, 472, 528A	2,000	1,071	1640	1570	4711
Prescribed Burning (Acres)	338	156	10	122	96	288
Trees & Shrubs (Acres)	612, 666	22	0	0	7	22
Conservation Tillage (Acres)	329A, 329B, 329C	1,776	7,468	11138	6794	20382
Conservation Crop Rotations (Acres)	328	240	1,711	4347	2099	6298
Cover Crops (Acres)	340	383	276	22	227	681
Wildlife Habitat (Acres)	644, 645	1,574	723	2510	1602	4807
Brush Management (Acres)	314	0	0	0	0	0
Restoration of Declining Habitat (Acres)	643	1,085	62	546	564	1693
Wetland Wildlife Habitat Management (Acres)	644	394	121	40	185	555
Wetlands (Acres)	657, 658, 659	1,115	477	111	568	1703
<b>LANDS REMOVED FROM PRODUCTION THROUGH FARM BILL PROGRAMS<sup>11</sup></b>						
<b>Program</b>					<b>Acres</b>	
Conservation Reserve Program (CRP)					20,764	
Wetland Restoration Program (WRP)					629	
Conservation Reserve Enhancement Program (CREP)					9,454	

**Socioeconomic and Agricultural Data (Relevant)**

Estimates indicate the Cottonwood subbasin has a population of just under 19,000 people. Median household income in the district is nearly \$37,000 annually, roughly 80% of the national average. Sixty seven percent of the population over the age of 18 is active in the workforce, and approximately 9% of the residents in the watershed are below the national poverty level.

There are 1,837 Farms in the Cottonwood watershed. Approximately thirty nine 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 in size.



<b>Cottonwood HUC#7020008</b> <sup>12</sup>		
<b>Population Data</b>	Watershed Population	18,968
	Unemployment Rate	4.04%
	Median Household Income	36,956
	% below poverty level	9%
	Median Value of Home	52,953
<b>Farms</b>	# of Farms	1,837
	# of Operators	1,837
	# of Full Time Operators	1,254
	# of Part Time Operators	583
	<b>Total Crop/Pasturelands</b>	<b>730,700</b>
<b>Farm Size</b>	1 to 49 Acres	371
	50 to 179 Acres	355
	180 to 499 Acres	545
	500 to 999 Acres	392
	1,000 Acres or more	173
<b>Livestock &amp; Poultry</b>	Cattle - Beef	70,886
	Cattle - Dairy	16,659
	Chicken	210,219
	Swine	465,564
	Turkey	581,966
	Other	12,647
	<b>Animal Count Total:</b>	<b>1,357,930</b>
<b>Total Permitted Animal Feed Operations</b>	<b>696</b>	
<b>Chemicals Applied (Acres treated)</b>	Insecticides	55,917 (Acres)
	Herbicides	406,223
	Wormicides	16,803
	Fruiticides	726
	Total Chemicals	749,673
	<b>% State Chemical Totals</b>	<b>3.4%</b>

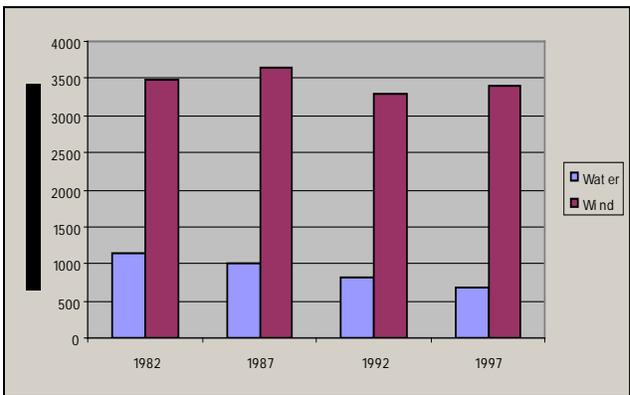
**RESOURCE CONCERNS**

In the Cottonwood Watershed for 2006, County Soil and Water Conservation Districts have identified the following resource concerns as top priorities for conservation and cost sharing efforts:



- Groundwater Protection focusing on wellhead protection for public drinking water supply, delineating wellhead protection areas, sealing abandoned wells.
- Drainage Management focusing on wetland restoration and floodwater retention opportunities, promoting filterstrips, assessing drainage ditches.
- Surface Water Quality: Reduction of Priority Pollutants Phosphorous, Nitrogen, and Fecal Coliform Bacteria. Reduction of priority pollutants and sediments in surface waters is a priority issue throughout the watershed. Identification of failing septic systems and problem feedlots is crucial.
- Ground Water Quality, Nutrients, Organics, Animal and Human Waste. Aging septic systems, feedlot runoff, cropland nutrient runoff, tilling practices, and abandoned wells all pose significant threats to groundwater quality throughout the region.
- Erosion and Sediment Control focusing on residue management region wide, restoration of habitat, structural conservation practices. Drained wetlands, crop production in flood prone areas, and aging dams all diminish surface water quality and productivity. Restoration of wetlands and wildlife habitat, structural conservation practices, and removing flood-prone lands from production all serve to lessen the impact of erosion and flooding while improving drainage.

- Sheet and rill erosion by water on the cropland and pastureland declined by approximately 40% between 1982 and 1997.
- Wind erosion on cropland remains a concern for the region. According to NRI estimates, wind erosion saw a reduction of only 2.5% between 1982-1997.



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Federally Listed Threatened And Endangered Species <sup>/14</sup>	
ENDANGERED SPECIES	CANDIDATE SPECIES
Fish – Topeka Shiner	Insect – Dakota Skipper
THREATENED SPECIES	PROPOSED SPECIES
Plants – Prairie Bush Clover	None
<b>Essential Habitat</b> - Prairie river and stream habitat for the Topeka Shiner in Murray County	

## Watershed Projects, Plans and Monitoring

- Paired Watershed Project. A farmer-initiated, farmer-led effort to improve water quality in the Minnesota River Basin through the voluntary adoption of Best Management Practices (BMPs) for crop nutrients. Two watersheds, Seven Mile Creek and Huelskamp Creek, were selected for the study. As part of the project, both watersheds are being monitored at the mouth of each minor watershed (four sites, total) for water flow, sediment, total and dissolved phosphate, and nitrates.
- Minnesota River Turbidity TMDL Work Plan, MPCA. This project concerns turbidity impairments in the Minnesota River Basin. The project area begins near Lac Qui Parle, and ends at Jordan. The effort involves 18 reaches on the mainstem and lower tributaries. It includes the Chippewa, Redwood, Cottonwood, Blue Earth, Hawk Creek, Yellow Medicine, and Le Sueur rivers.
- Cottonwood River Restoration Project. The mission of the Cottonwood River Restoration Project is to promote sustainable conservation land use changes through establishing watershed identity and by cooperatively working to increase watershed awareness that will lead to the restoration of the river's environmental health and increased recreational use.
- Little Cottonwood River Watershed Project. Between CRP and CREP, more than 4,000 acres have been enrolled by an estimated 150 landowners within the 170 square-mile watershed. These land enrollments conserve about 16,000 tons of soil and prevent an estimated 4,500 pounds of phosphorus and 80,000 pounds of nitrates from entering the river each year. Enrolling these marginal areas into permanent and semi-permanent grass cover not only reduced sediment and nutrient loadings to the river, but also reduced the negative impacts of flooding.
- Seven Mile Creek Watershed Project (CWP) The Seven Mile Creek Watershed Project is a collaborative effort to protect and enhance the water quality of Seven Mile Creek. The creek is Nicollet County's most visible natural resource, with a 630-acre county park located at the mouth of the watershed. The park and designated trout stream are used by thousands of visitors every year.



\* 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

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| <ul style="list-style-type: none"> <li>               • <b>Area II Minnesota River Basin Projects, Inc</b><br/>               1400 E Lyon Street, Bx 267 Marshall, MN 56258<br/>               Phone 507-537-6369 Fax 507-537-6368             </li> </ul> | <ul style="list-style-type: none"> <li>               • <b>Land Stewardship Project</b><br/>               14758 Ostlund Trail N Marine, MN 55047<br/>               Phone 612 433-2770             </li> </ul>                                     |
| <ul style="list-style-type: none"> <li>               • <b>Blue Earth River Basin Initiative</b><br/>               426 Winnebago Ave #100 Fairmont, MN 56031<br/>               Phone 507 238-5449 Fax 507 238-4002             </li> </ul>               | <ul style="list-style-type: none"> <li>               • <b>Lyon County SWCD</b><br/>               1424 E. College Drive, Suite 600 Marshall, MN 56258<br/>               Phone 507-537-0396 Fax 507-532-7479             </li> </ul>               |
| <ul style="list-style-type: none"> <li>               • <b>Brown County SWCD</b><br/>               300 2nd Ave SW, Sleepy Eye, MN 56085<br/>               Phone 507 794-2553 Fax 507 794-5553             </li> </ul>                                    | <ul style="list-style-type: none"> <li>               • <b>Minnesota River Basin Joint Powers Board</b><br/>               600 E. 4th St Chaska, MN 55318-2108<br/>               Phone 952-361-6590 Fax 952-361-6594             </li> </ul>       |
| <ul style="list-style-type: none"> <li>               • <b>Coalition for a Clean Minnesota River (CCMR)</b><br/>               PO Box 488 New Ulm, MN 56073<br/>               Phone 507 359-2346             </li> </ul>                                  | <ul style="list-style-type: none"> <li>               • <b>Murray County SWCD</b><br/>               2740 22nd St Ste 3, Slayton, MN 56172<br/>               Phone 507 836-6990 Fax 507 836-6697             </li> </ul>                           |
| <ul style="list-style-type: none"> <li>               • <b>Cottonwood County SWCD</b><br/>               940 4th Ave Windom, MN 56101-1639<br/>               Phone 507-831-1153             </li> </ul>   | <ul style="list-style-type: none"> <li>               • <b>Redwood SWCD</b><br/>               1241 E Bridge Street Redwood Falls, MN 56283<br/>               Phone 507-637-2427 ext. 3 Fax 507-637-8136             </li> </ul>                   |
| <ul style="list-style-type: none"> <li>               • <b>Cottonwood River CWP MPCA,</b><br/>               520 Lafayette Rd. St. Paul, MN 55155,<br/>               Phone 612-282-5559             </li> </ul>   | <ul style="list-style-type: none"> <li>               • <b>Redwood-Cottonwood Rivers Control Area</b><br/>               1241 E. Bridge St Redwood Falls, MN 56283<br/>               Phone 507-637-2142, fax 507-637-2134.             </li> </ul> |

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## Footnotes / Bibliography

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1. Ownership Layer – Source: MN Stewardship Data: Minnesota Department of Natural Resources, Section of Wildlife, BRW, Inc, 2007. 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: 19990631; 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. USGS 1:100,000 Hydrography Layer .This data set represents all features coded as ‘rivers’ on the USGS 1:100,000-scale DLG Hydrography data set. This current version was converted to ARC/INFO by the Land Management Information Center and edge-matched across map sheet boundaries. Minnesota DNR made further modifications to the files, verified lake feature identifiers, and created a state layer from the separate 100k data. The Hydro 100k layer was compared to MPCA’s 303(d) data to derive percentage of listed waters.
5. Land Cover / Land Use / Hydro 100k Buffer. Using the 100k 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), 2006. 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)

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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. Geological description: Broussard, W.L., Anderson, H.W., Jr., and Farrell, D. F., 1973. WATER RESOURCES OF THE COTTONWOOD RIVER WATERSHED: U.S. Geological Survey Hydrologic Investigations Atlas HA-466.

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](http://www.fsa.usda.gov/crpstorpt/07Approved/r1sumyr/mn.htm) (7/30/04). CREP Acres: <http://www.bwsr.state.mn.us/easements/crep/easementssummary.html> (7/31/03). WRP Acres: NRCS (8/16/04). 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. Unemployment statistics obtained from the Bureau of Labor Statistics - Labor Force Data by County, 2006 Annual Averages <http://www.bls.gov> 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/>. 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>.