

Rapid Watershed Assessment
Resource Profile
Redwood (MN) HUC: 7020006



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 Redwood 8-digit Hydrological Unit Code (HUC) Subbasin is located in the Prairie Parkland Ecological Province of Southwestern Minnesota. This largely agricultural watershed is 451,249 acres in size. Over ninety six percent of the land is privately owned.

There are 949 farms in the subbasin. About 42 percent of the operations are less than 180 acres in size, over 49 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, & Fecal Coliform).



County Totals

	Acres in HUC	% HUC
Yellow Medicine	488,655.90	3.2
Redwood	564,181.97	28.4
Lincoln	351,290.20	19.1
Lyon	462,076.16	43.5
Pipestone	298,519.41	3.7
Murray	460,663.36	2.1
Total acres:	840,175.0	100

Physical Description

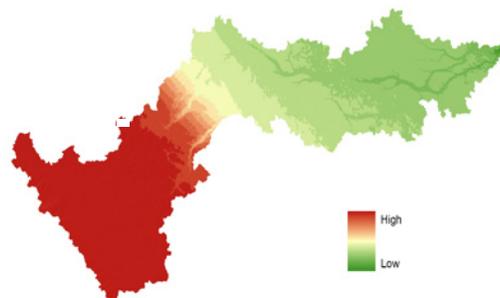
This once glaciated area is part of Minnesota's Northern Glaciated Plains Ecoregion. Soils in this HUC are generally clay and sand, with considerable deposits of glacial till and outwash. Average elevation in the watershed is 1165 feet above sea level, with the highest values being in the southwest portions of the watershed, while lower elevations are found near central and Northeastern regions.

Precipitation in the watershed ranges from 25 to 27 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 (75%), followed by grass and pasture (17%), and wetlands (3%).

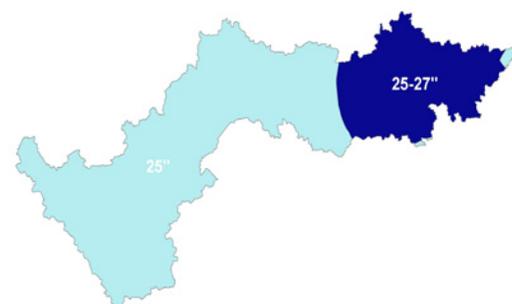
Land use within the Redwood watershed is primarily agricultural, accounting for approximately 82% of the available acres. Corn and soybeans are grown on approximately 86% of croppable lands; small grains, hay, and grasslands enrolled in the Conservation Reserve Program (CRP) make up the majority of the balance.

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

Relief

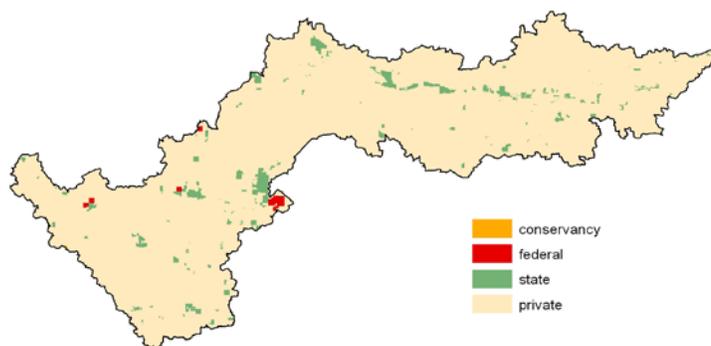


Average Precipitation (inches)



Ownership* ¹

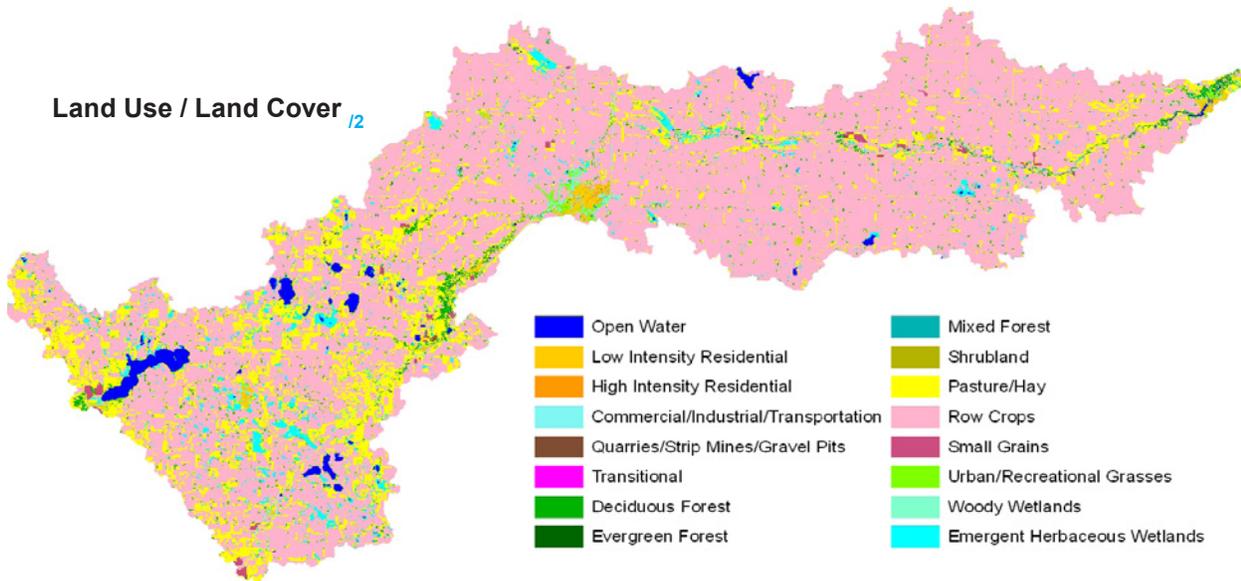
Ownership Type	Acres	% of HUC
Conservancy	32.17	0.01
County	0.00	0.00
Federal	1,553.44	0.34
State-Misc.	14,783.02	3.28
Other Public	0.00	0.00
Tribal	0.00	0.00
Private Major	0.00	0.00
Private	434,894.36	96.38
Ownership Totals:	451,250	100



* 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 Redwood Watershed covers an area of 451,250 acres. Over ninety six percent of the land in the watershed is owned by private landholders (434,894.36 acres). The second largest ownership type is State, with just over 14,780 acres (3.28%), followed by Federal with approximately 1,550 acres (0.34%). Lands owned by conservancy groups comprise the smallest ownership class with just over 32 acres (0.01%), Data shows no tribal, county, or private-major lands in the region. Land use by ownership type is represented in the table below.



Ownership / Land Use ^{/3}

Landcover/Use	Public		Private		Tribal		Total Acres	Percent
	Acres	Percent	Acres	Percent	Acres	Percent		
Forest	992.0	6.076	9,126.51	2.02	0.0	0.00	10118.52	2.24%
Grain Crops	305.7	1.872	1,441.93	0.32	0.0	0.00	1747.58	0.39%
Grass, etc	4,827.7	29.568	70,831.01	15.70	0.0	0.00	75658.73	16.77%
Orchards	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00%
Row Crops	5,425.9	33.231	332,231.78	73.62	0.0	0.00	337657.64	74.83%
Shrub etc	48.6	0.298	527.82	0.12	0.0	0.00	576.45	0.13%
Wetlands	4,001.9	24.510	9,705.17	2.15	0.0	0.00	13707.08	3.04%
Residential/Commercial	42.28	0.259	5,301.42	1.17	0.0	0.00	5343.70	1.18%
Open Water*	683.42	4.186	5767.14	1.28	0.0	0.00	6450.56	1.43%

* ownership undetermined

Totals:	16,327.48	3.62%	434,933	96.38%	0	0.00	451,250.0	100.00%
----------------	------------------	--------------	----------------	---------------	----------	-------------	------------------	----------------

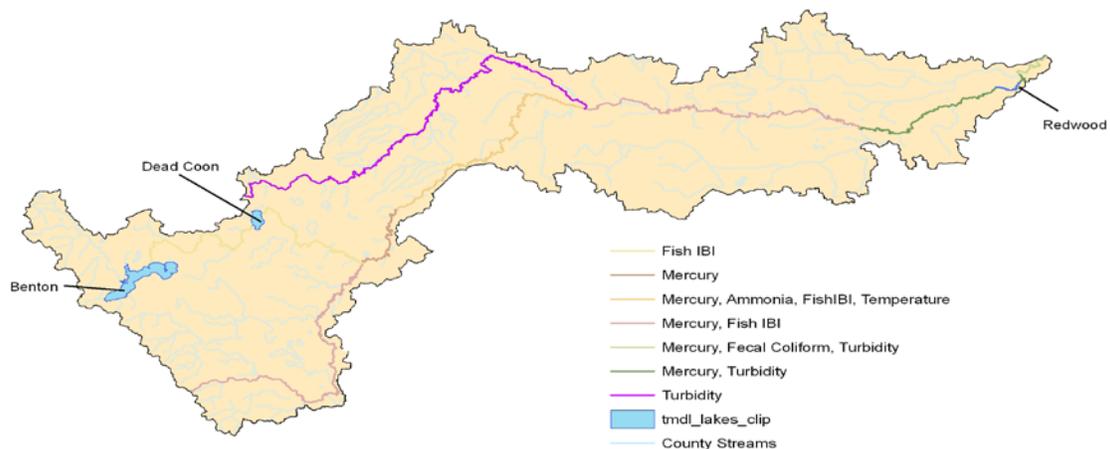
Physical Description (continued)

				cu. ft./sec
Stream Flow Data	USGS 05315000 REDWOOD RIVER NEAR MARSHALL, MN	Total Avg.	42.95	
		May – Sept. Yield	75.4	
Stream Data ⁴ (*Percent of Total HUC Stream Miles)		ACRES/MILES	PERCENT	
	Total Miles – Major (100K Hydro GIS Layer)	796	---	
	Total Miles – 303d/TMDL Listed Streams	193.8	24.30%	
Riparian Land Cover/Land Use ⁵ (Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)	Dev/Barren	213.1	1.1	
	Fallow	0.0	0	
	Forest	1,387.3	7.2	
	Grain Crops	68.0	0.4	
	Grass/Pasture	5,871.9	30.6	
	Orchards/Vine	0.0	0	
	Row Crops	8,518.3	44.4	
	Shrub/Range	78.5	0.4	
	Water	1,150.9	6.0	
	Wetlands	1,898.2	9.9	
	Total Buffer Acres	17,288.0	---	
Crop and Pastureland Land Capability Class ⁶ (Croplands & Pasturelands Only) (1997 NRI Estimates for Non- Federal Lands Only)	1 – slight limitations	24400	7%	
	2 – moderate limitations	261700	71.%	
	3 – severe limitations	42600	12%	
	4 – very severe limitations	26700	7%	
	5 – no erosion hazard, but other limitations	1900	1%	
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	7700	2%	
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	4900	1%	
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%	
	Total Crop & Pastureland	369,900	---	
Irrigated Lands ⁷ (1997 NRI Estimates for Non- Federal Lands Only)	TYPE OF LAND	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	0	0%	0%
	Uncultivated Cropland	0	0%	0%
	Pastureland	0	0%	0%
	Total Irrigated Lands	0	0%	0%

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 its 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.



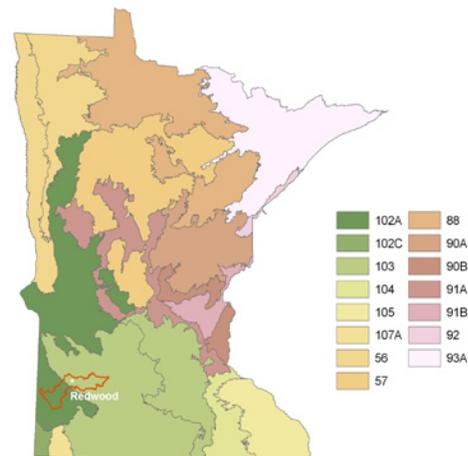
Listed Stream ^{/B}	Impairment	Affected Use
Redwood River; Ramsey Cr to Minnesota R	Mercury, Fecal Coliform, Turbidity	Aquatic Life, Aquatic Recreation, Aquatic Consumption
Redwood River; Below trout stream portion to Threemile Cr	Mercury, Ammonia, Fish IBI	Aquatic Life, Aquatic Recreation, Aquatic Consumption
Redwood River; Threemile Cr to Clear Cr	Mercury, Fish IBI	Aquatic Life and Aquatic Consumption
Threemile Creek; Headwaters to Redwood R	Turbidity	Aquatic Life
Redwood River; Headwaters to Coon Cr	Mercury, Fish IBI	Aquatic Life and Aquatic Consumption
Redwood River; Dam to Ramsey Cr	Mercury, Turbidity	Aquatic Life and Aquatic Consumption
Redwood River; Clear Cr to Dam, excluding Redwood Lk	Mercury, Turbidity	Aquatic Life and Aquatic Consumption
Redwood River; Coon Cr to Class 2A	Turbidity	Aquatic Life
Coon Creek: Lk Benton to Redwood R	Mercury	Aquatic Consumption
Redwood River; Trout stream portion	Mercury	Aquatic Consumption
Redwood River; Below trout stream portion to Threemile Cr	Mercury, Ammonia, Fish IBI	Aquatic Life, Aquatic Recreation, Aquatic Consumption
Listed Lake	Impairment	Affected Use
Dead Coon	Mercury	Aquatic Consumption
Redwood	Mercury	Aquatic Consumption
Benton	Mercury, Excess Nutrients	Aquatic Recreation, Aquatic Consumption

Common Resource Areas

The Redwood Watershed is located within two common resource areas, CRA 102A.1, and 103.1. ^{/9}

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.

103.1 – 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.



Only the major CRA units are described above.

 For further information, go to:

<http://soils.usda.gov/survey/geography/cra.html>

Soils / Geology

The oldest and deepest rocks of the Redwood River Watershed are Precambrian in age. These hard, relatively impermeable, crystalline rocks are of igneous and metamorphic origins. Overlying the Precambrian rocks throughout most of the watershed are sedimentary rocks of Cretaceous age. They consist mostly of shale and fairly continuous beds of poorly cemented siltstone and sandstone.

Quaternary glacial drift covers the entire watershed and forms the present land surface. The drift overlies the Cretaceous rocks in all but the easternmost part of the watershed where it is in direct contact with the underlying crystalline rocks. The drift is mostly clayey till, although locally continuous deposits of sand and gravel are common within the drift and at its surface.

The land surface slopes gently northeastward and eastward from altitudes greater than 1900 feet at the southwestern edge to less than 850 feet at the mouth of the Redwood River in the east. The area has slight local relief shaped by continental glaciation. ^{/10}

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

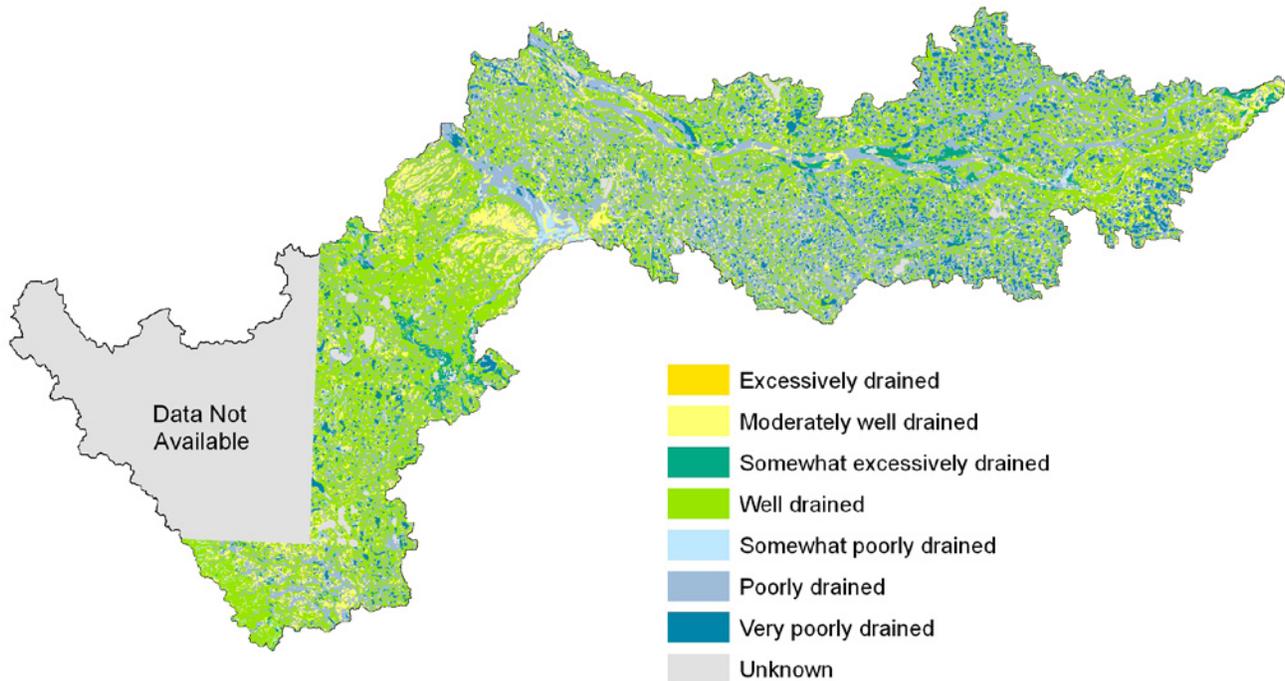
<http://soildatamart.usda.gov> to download SSURGO

 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.”



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

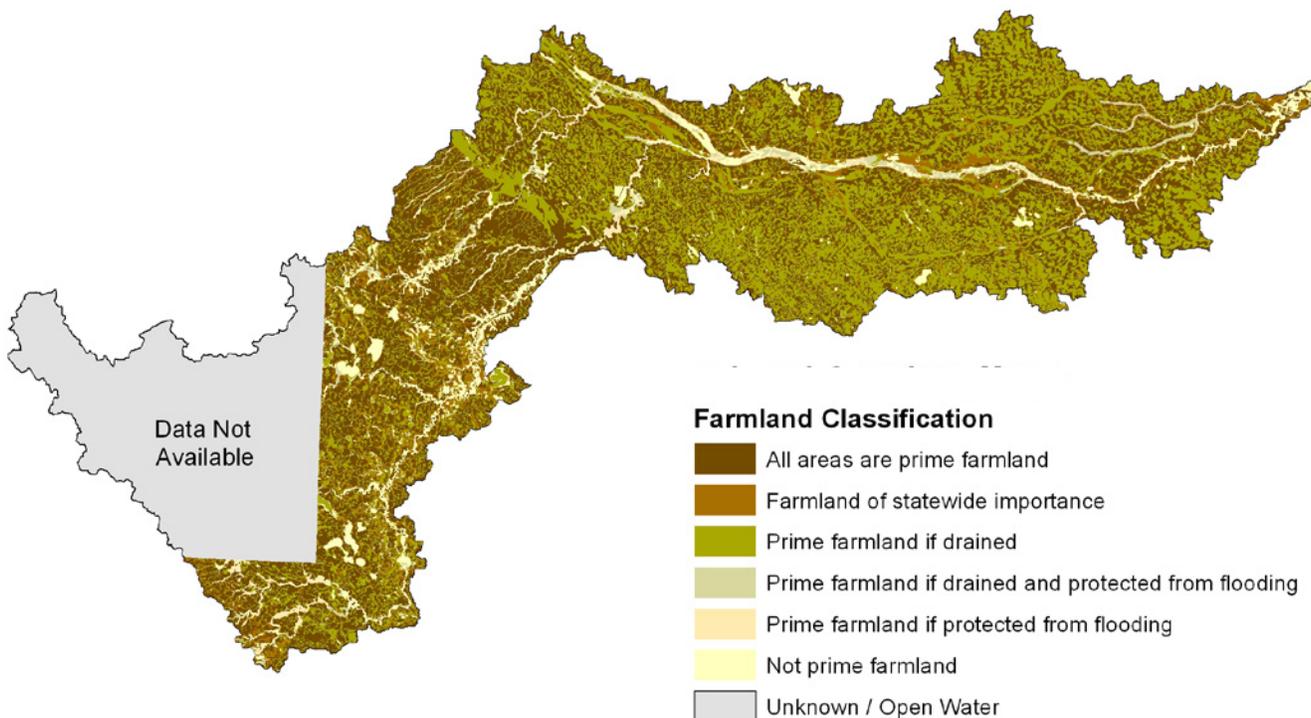
 certified soil tabular and spatial data.

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.



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.

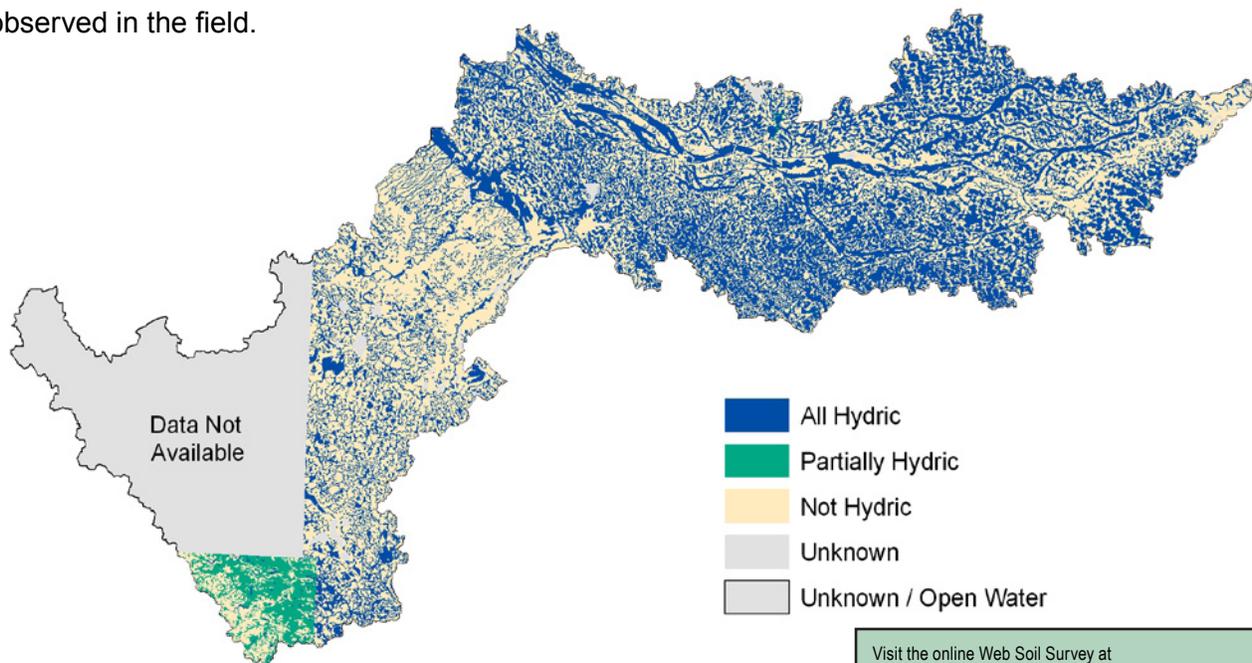
Hydric Soils

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.



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

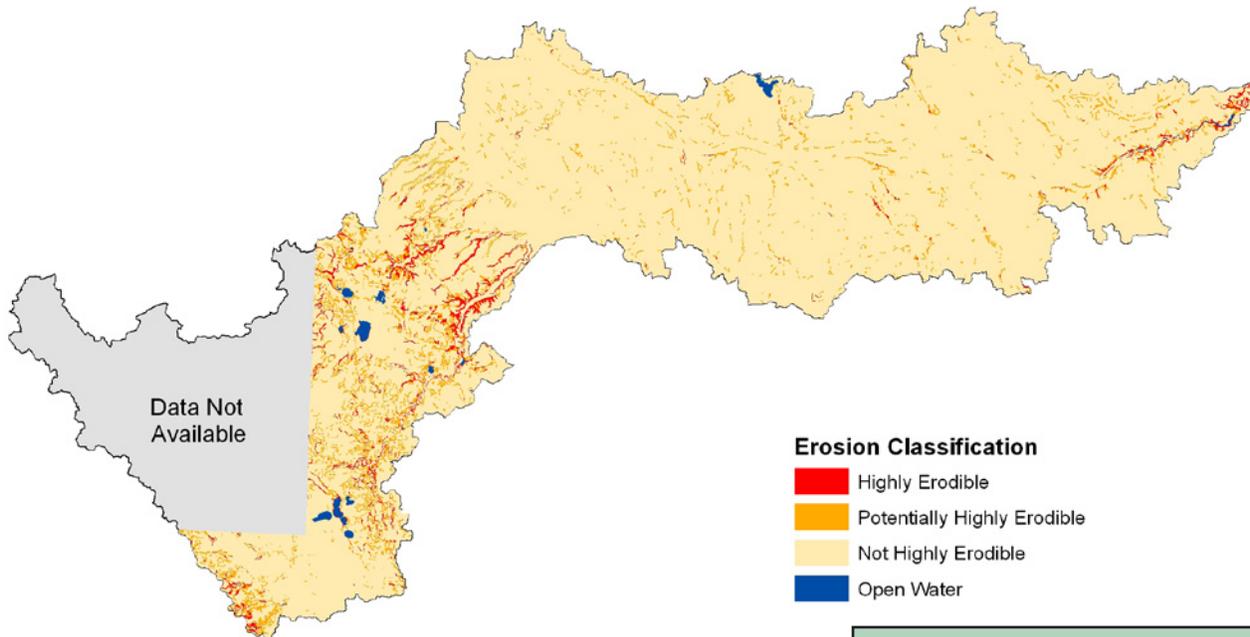
 certified soil tabular and spatial data.

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.

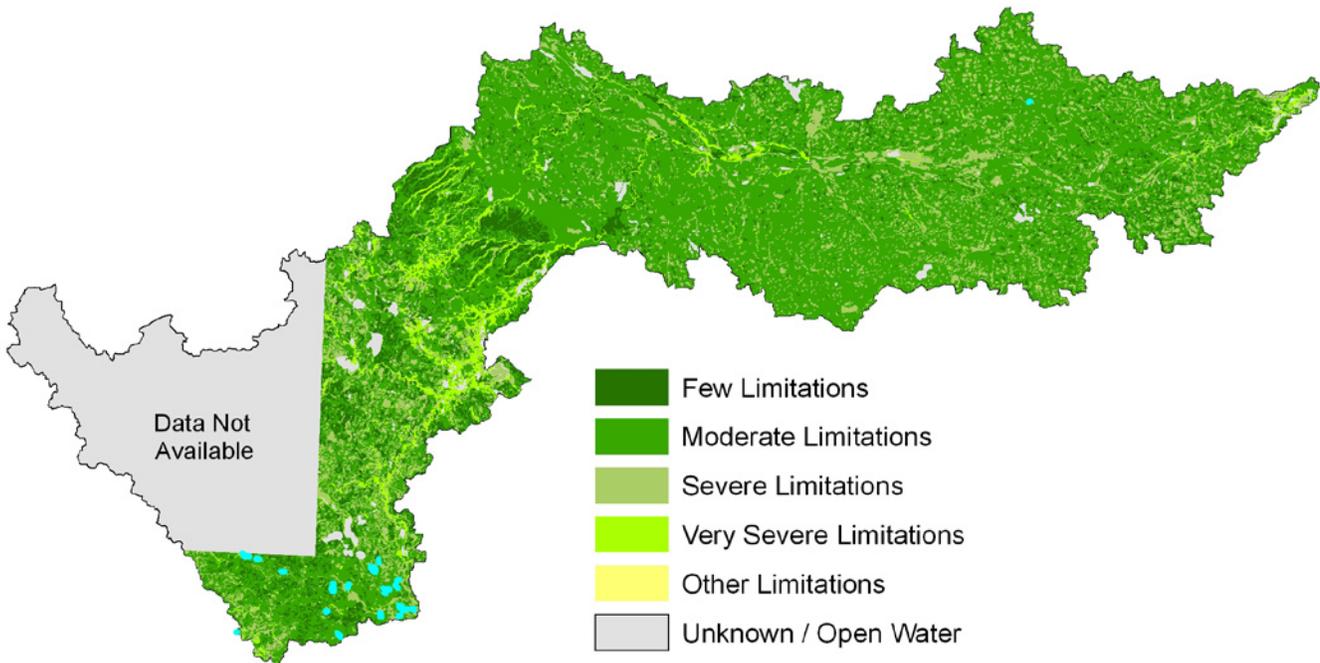


Visit the online Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables. Visit the Soil Data Mart at <http://soildatamart.usda.gov> to download SSURGO certified soil tabular and spatial data.

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.



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.

Performance Results System and Other Data

NRCS Conservation treatment practices applied or prescribed within the Redwood River watershed in the three year reporting period have primarily concentrated on Conservation tillage (2,766 Acres/year average), Nutrient management (2,741 Acres/yr), Conservation crop rotations (1,877 Acres/yr), and Pest management (1,668 Acres/yr). Other notable efforts have been made in areas of air quality/ wind erosion management, with the addition of over 23,000 feet of windbreak annually.

Conservation Treatment Acres	NRCS Practice Code	FY 04	FY 05	FY 06	Avg/Year	Total
Waste Management (Number)	313, 317, 359	0	0	0	0	0
Buffers (Acres)	391, 393	111	200	124	145	435
Erosion Control (Acres)	311, 332, 589, 386, 412, 600, 601, 603, 380, 650	2180	5	13	733	2198
Irrigation Water Management (Acres)	449	0	0	0	0	0
Wind Break (ft)	380	9970	20155	40164	23430	70289
Atmospheric Resource Quality Management (Acres)	370	0	0	0	0	0
Nutrient Management (Acres)	590	1409	3707	3106	2741	8222
Pest Management (Acres)	595	0	2360	2645	1668	5005
Prescribed Grazing (Acres)	528, 472, 528A	569	246	1023	613	1838
Prescribed Burning (Acres)	338	49	2	59	37	110
Trees & Shrubs (Acres)	612, 666	15	2	0	6	17
Conservation Tillage (Acres)	329A, 329B, 329C	363	4786	3149	2766	8298
Conservation Crop Rotations (Acres)	328	430	3606	1595	1877	5631
Cover Crops (Acres)	340	0	0	0	0	0
Wildlife Habitat (Acres)	644, 645	385	286	586	419	1257
Brush Management (Acres)	314	0	0	0	0	0
Restoration of Declining Habitat (Acres)	643	175	5	5	62	185
Wetland Wildlife Habitat Management (Acres)	644	89	8	38	45	135
Wetlands (Acres)	657, 658, 659	269	42	73	128	384
LANDS REMOVED FROM PRODUCTION THROUGH FARM BILL PROGRAMS¹¹						
Program					Acres	
Conservation Reserve Program (CRP)					18,922	
Wetland Restoration Program (WRP)					75	
Conservation Reserve Enhancement Program (CREP)					4,655	

Socioeconomic and Agricultural Data (Relevant)

Estimates show the Redwood subbasin has a population of slightly less than 18,000 people. Median household income throughout the district is \$36,624 yearly, roughly 86% of the national average. Sixty eight percent of the population over the age of 18 is active in the workforce, and approximately 9% of the residents in the watershed are living below the national poverty level.

There are 949 Farms in the Watershed. Approximately forty one percent of the operations are less than 180 acres in size, nearly fifty percent are from 180 to 1000 acres in size, and the remaining farms are greater than 1000 acres in size.



Redwood Watershed HUC #7020006 ¹²		
Population Data	Watershed Population	17,975
	Unemployment Rate	32%
	Median Household Income	36,624
	% below poverty level	9%
	Median Value of Home	64581
Farms	# of Farms	949
	# of Operators	949
	# of Full Time Operators	728
	# of Part Time Operators	221
	Total Crop/Pasturelands	369,900
Farm Size	1 to 49 Acres	205
	50 to 179 Acres	188
	180 to 499 Acres	264
	500 to 999 Acres	202
	1,000 Acres or more	90
Livestock & Poultry	Cattle - Beef	44,824
	Cattle - Dairy	7,494
	Chicken	92,714
	Swine	198,016
	Turkey	287,412
	Other	11,620
	Animal Count Total:	642,080
	Total Permitted AFO's	378
Chemicals (Acres Applied)	Insecticides	24,552
	Herbicides	203,035
	Wormicides	6,508
	Fruiticides	404
	Total Chemicals	234,499
	% State Chemical Totals	1.64%

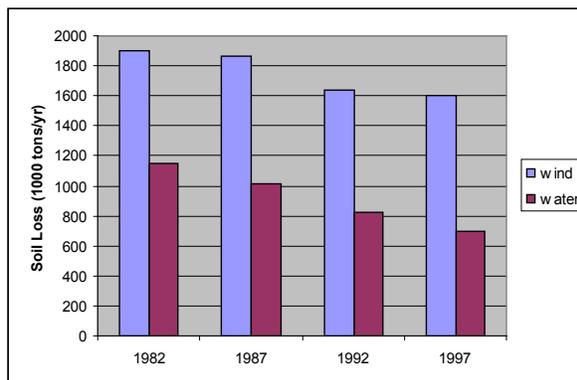
RESOURCE CONCERNS

County Soil and Water Conservation Districts in the Redwood River Watershed 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.



- NRI estimates show sheet and rill erosion by water on the crop and pastureland declined by approximately 452,800 (39%) tons of soil between 1982 to 1997.
- NRI estimates for wind erosion on cropland show a decrease of 296,900 tons (15.6%) between 1982 and 1997.



/13

Federally Listed Threatened And Endangered Species ^{/14}

ENDANGERED SPECIES	CANDIDATE SPECIES
Fish – Topeka Shiner	Insect – Dakota Skipper
THREATENED SPECIES	PROPOSED SPECIES
Plants – Western Prairie Fringed Orchid, Prairie Bush Clover	None
Essential Habitat - Prairie river and stream habitat for the Topeka Shiner in Lincoln, Pipestone and Murray Counties. Gravelly soil in dry to mesic prairies for the Prairie Bush Clover in Redwood County. Wet prairies and sedge meadows for the Western Prairie Fringed Orchid in Pipestone and Lincoln County.	

Watershed Projects, Plans and Monitoring

- **Redwood River TMDL Project,**
[Minnesota Pollution Control Agency](#)
- **Lake Redwood Reservoir Reclamation and Enhancement Project**
[Redwood / Cottonwood River Control Area](#)
- **Lake Pelican Water Project**
[Area II Minnesota River Basin Projects Inc.](#)
- **Redwood River Watershed Project**
[Lyon County SWCD](#)
- **Minnett - Krantz Reservoir Project**
[Pipestone County SWCD](#)
- **Redwood River Basin Judicial Ditch 31 Hydrologic Modeling**
[Minnesota Natural Resources Conservation Service](#)
- **Redwood River Clean Water Project Study**
[Redwood / Cottonwood River Control Area](#)
- **Redwood River Clean Water Project Phase II**
[Minnesota Pollution Control Agency.](#)
- **Minnesota River Turbidity TMDL Work Plan**
[Minnesota Pollution Control Agency.](#)
- **MRAP Biological & Toxicological Assessment**
[Minnesota Pollution Control Agency](#)
- **MRAP Land Use Assessment Levels III, IV**
[Minnesota Pollution Control Agency](#)
- **Redwood Watershed CSP**
[Minnesota Natural Resources Conservation Service](#)
- **Little Cottonwood River CWP-Phase I and EQIP Prog Watershed Priority area**
[Redwood / Cottonwood Control Area](#)

* 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
- **Pipestone County SWCD**
119 2nd Avenue SW, Suite 13 Pipestone, MN 56164
Phone 507-825-5478 Fax 507-825-5571
- **Lincoln County SWCD**
P.O. Box 32 Ivanhoe, MN 56142
Phone 507-694-1630 ext. 3 Fax 507-694-1850
- **Coalition for a Clean Minnesota River (CCMR)**
PO Box 488 New Ulm, MN 56073
Phone 507 359-2346
- **Yellow Medicine County SWCD**
1000 10th Avenue, Bx 545 Clarkfield, MN 56223
Phone 320-669-4442 ext. 3 Fax 320-669-7525
- **Redwood River CWP MPCA,**
520 Lafayette Rd. St. Paul, MN 55155,
Phone 612-282-5559
- **Land Stewardship Project**
14758 Ostlund Trail N Marine, MN 55047
Phone 612 433-2770
- **Lyon County SWCD**
1424 E. College Drive, Suite 600 Marshall, MN 56258
Phone 507-537-0396 Fax 507-532-7479
- **Minnesota River Basin Joint Powers Board**
600 E. 4th St Chaska, MN 55318-2108
Phone 952-361-6590 Fax 952-361-6594
- **Murray County SWCD**
2740 22nd St Ste 3, Slayton, MN 56172
Phone 507 836-6990 Fax 507 836-6697
- **Redwood SWCD**
1241 E Bridge Street Redwood Falls, MN 56283
Phone 507-637-2427 ext. 3 Fax 507-637-8136
- **Redwood-Cottonwood Rivers Control Area**
1241 E. Bridge St Redwood Falls, MN 56283
Phone 507-637-2142, fax 507-637-2134.

Footnotes / Bibliography

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)

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: Waters, T. F., 1977. The Streams and Rivers of Minnesota: University of Minnesota Press, Mpls., Minnesota

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 (7/30/04). 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. 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>.