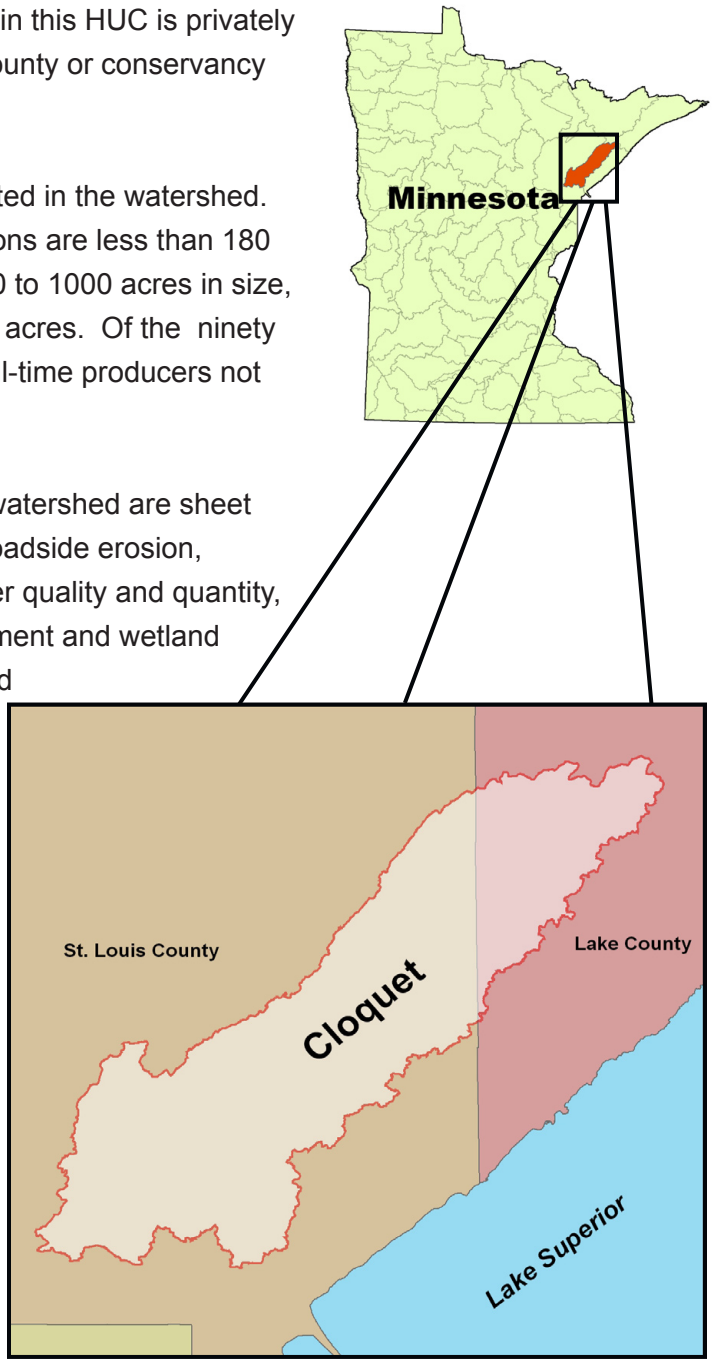
Rapid Watershed Assessment
Cloquet River
(MN) HUC: 04010202

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 Cloquet River 8-Digit Hydrologic Unit Code (HUC) subbasin is located in the Northern Lakes and Forest ecoregion of Minnesota. This largely forested watershed is 507,860 acres in size. Approximately twenty five percent of the land in this HUC is privately owned, and the remainder is state, federal, county or conservancy land, or held by corporate interests.



Assessment estimates indicate 94 farms located in the watershed. Approximately sixty six percent of the operations are less than 180 acres in size, thirty three percent are from 180 to 1000 acres in size, and the remaining farms are larger than 1000 acres. Of the ninety operators in the basin, fifty two percent are full-time producers not reliant on off-farm income.

The main resource concerns throughout the watershed are sheet and rill erosion, streambank, lakeshore and roadside erosion, groundwater quality and quantity, surfacewater quality and quantity, woodland management, stormwater management and wetland management. Thermal pollution of designated trout streams from beaver infestation is also a major resource concern for Cloquet River tributary streams.

County Totals

County	*Acres in HUC*	*% HUC*
St. Louis	398,006	78.4%
Lake	109,856	21.6%
Total acres:	**507,862**	**100%**

Physical Description

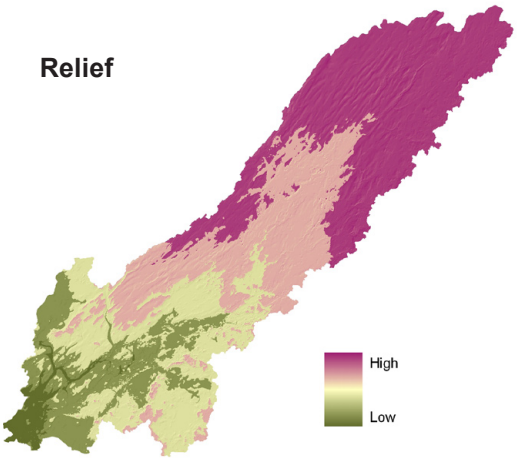
Average elevation in the Cloquet subbasin is approximately 938 feet above mean sea level (msl). Elevations throughout the watershed range from values as high as 1,220 feet to values as low as 640 feet.

Precipitation in the watershed ranges from 27 to 29 inches annually. Evaporation estimates are between 26 to 30 inches annually (Minnesota State Climatologists Office, 1999).

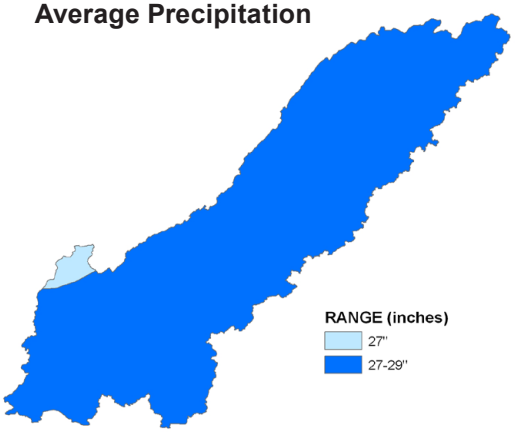
Much of the land within this HUC is not considered highly erodible, though erosion potential increases on steeper sideslopes. Soil fertility here is regarded as low to moderate, and land is poorly to moderately suited to agricultural uses. Predominate land uses / land covers are Forest (80%), Wetlands (6.4%), Open Water (5.9%), and Shrubland (4.1%).

Land use within the watershed is modestly agricultural, accounting for approximately two and a half percent of the available acres. Development pressure is moderate, with some farms, timberland, and lakeshore being parceled out for recreation, lake or country homes.

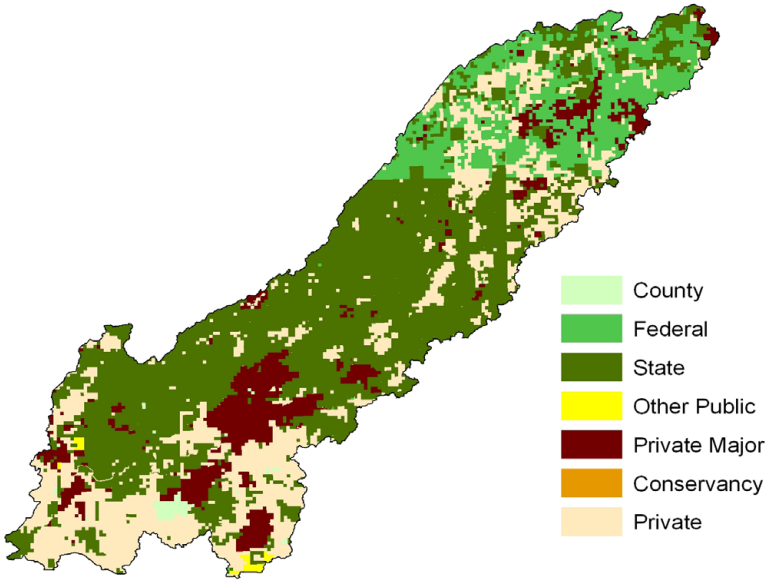
Relief



Average Precipitation



Ownership[1]



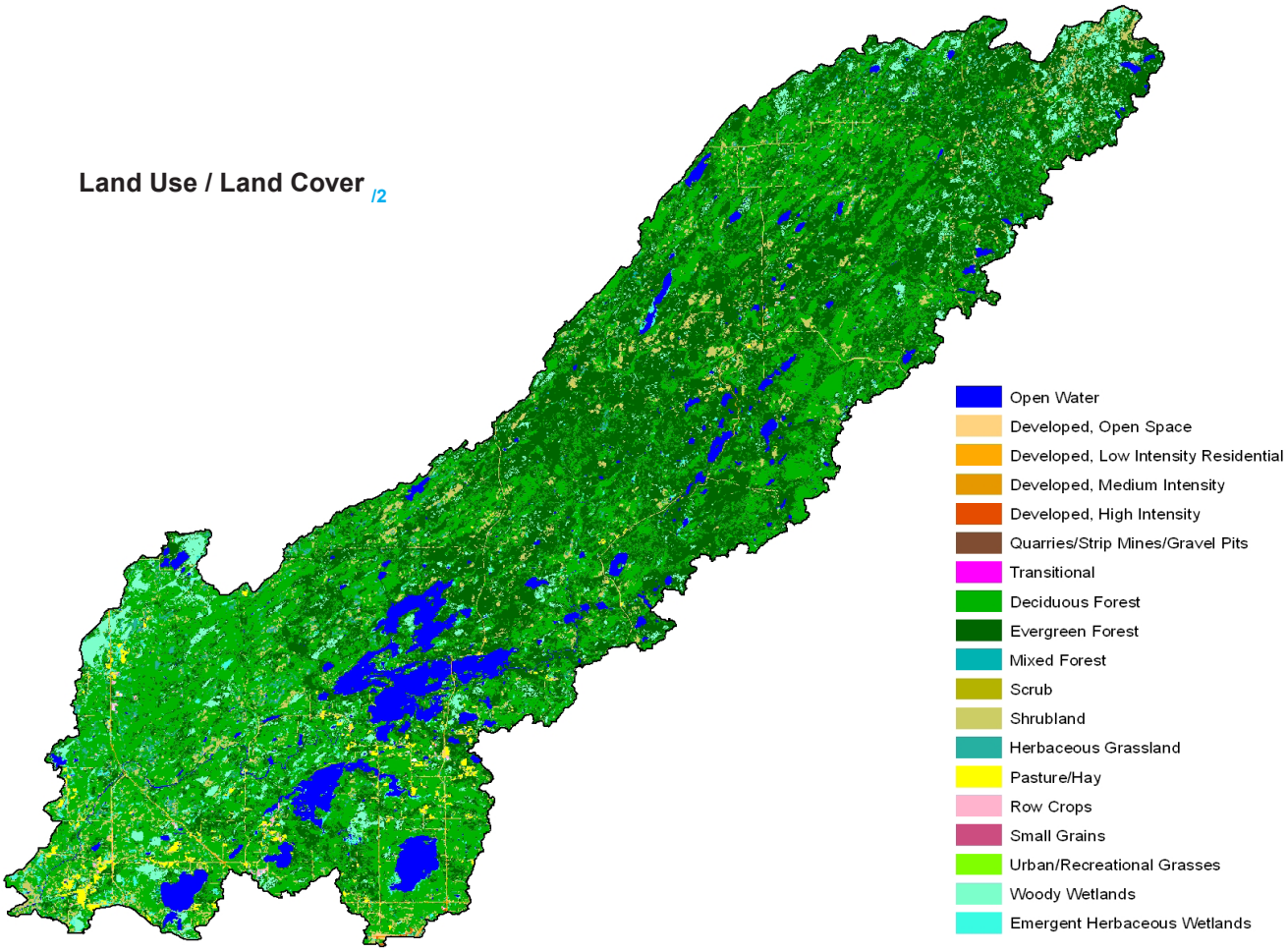
Ownership Type*	Acres	% of HUC
Conservancy	12	0.0
County	3,420	0.7
Federal	67,225	13.2
State	254,138	50.0
Other	1,773	0.3
Tribal	-	-
Private Major	53,593	10.6
Private	127,702	25.1
Total Acres:	**507,862**	**100**

* Ownership totals derived from 2007 MN DNR GAP Stewardship 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 watershed covers an area of approximately 507,860 acres. Fifty percent of the land in the watershed is State owned (254,138 acres). The second largest ownership type is Private, with approximately 127,702 acres (25.1%), followed by Federal with 67,225 acres (13.2%), and Private-Major, with 53,593 acres (10.6%), and County with 3,420 acres (0.7%). There are 1,773 acres of miscellaneous "Other Public" lands, and 12 acres of conservancy lands in the basin. Available ownership data shows no major Tribal land holdings in the region, though Lands owned by members of the Fond du Lac Band of Lake Superior Chippewa are located in the southern reaches of the watershed. Land use by ownership type is represented in the table below.

Land Use / Land Cover /2



Ownership / Land Use /3

	Public		Private**		Tribal			
Landcover/Use	**Acres**	**% Public**	**Acres**	**% Private**	**Acres**	**% Tribal**	**Total Acres**	**Percent**
Forest	278,091	54.8%	128,010	25.2%	0	0.0%	406,100	80.0%
Grass, etc	4,960	1.0%	6,670	1.3%	0	0.0%	11,630	2.3%
Orchards	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Row Crops	159	0.0%	500	0.1%	0	0.0%	659	0.1%
Shrub etc	15,021	3.0%	6,037	1.2%	0	0.0%	21,058	4.1%
Wetlands	22,629	4.5%	9,638	1.9%	0	0.0%	32,268	6.4%
Residential/Commercial	1,775	0.3%	4,486	0.9%	0	0.0%	6,262	1.2%
Open Water*	3,723	0.7%	26,163	5.2%	0	0.0%	29,886	5.9%
* ownership undetermined			** includes private-major					
Watershed Totals:	**326,358**	**64.26%**	**181,505**	**35.7%**	**0**	**0.0%**	**507,862**	**100%**

Physical Description (continued)

			cu. ft/sec
Stream Flow Data	USGS Stream Flow Data Not Available for this HUC. View daily discharge @ www.shorelandtraditions.com/levels.htm	**Total Avg.**	--
		May – Sept. Avg. Yield	--
Stream Data[4] *(*Percent of Total HUC Stream Miles)*		**MILES**	**PERCENT**
	Total Miles – Major (100K Hydro GIS Layer)	993.6	---
	303d/TMDL Listed Streams (DEQ)	0	0%
Riparian Land Cover/Land Use[5] *(Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)*	**Land Use Type**	**Acres**	**Percent**
	Forest	16,072	67.5%
	Grain Crops	0	0.0%
	Grass, etc	107	0.5%
	Orchards	0	0.0%
	Row Crops	8	0.0%
	Shrub etc	514	2.2%
	Wetlands	2,031	8.5%
	Residential/Commercial	178	0.7%
	Open Water*	4,896	20.6%
	Total Buffer Acres:	**23,806**	100%
Crop and Pastureland Land Capability Class[6] *(Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	0	0%
	3 – severe limitations	0	0%
	4 – very severe limitations	0	0%
	5 – no erosion hazard, but other limitations		0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	0	0%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	0	0%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	**0**	**---**

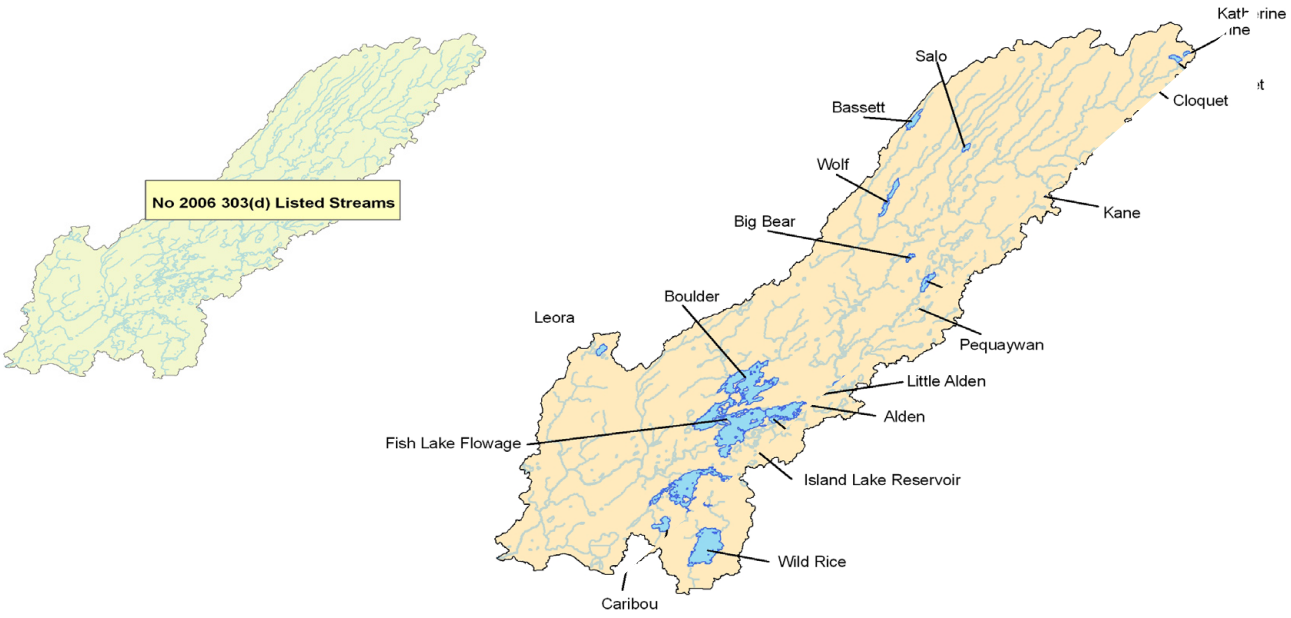
Not Reported for HUC 04010202

	TYPE OF LAND	**ACRES**	**% of Irrigated Lands**	**% of Cropland**
Irrigated Lands[7] *(1997 NRI Estimates for Non-Federal Lands Only)*	**Cultivated Cropland / Pastureland**	0	0%	0%
	Uncultivated Cropland	0	0%	0%
	Total Irrigated Lands	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.

2006 Minnesota 303d Listed Waters - Cloquet River Watershed[/8]

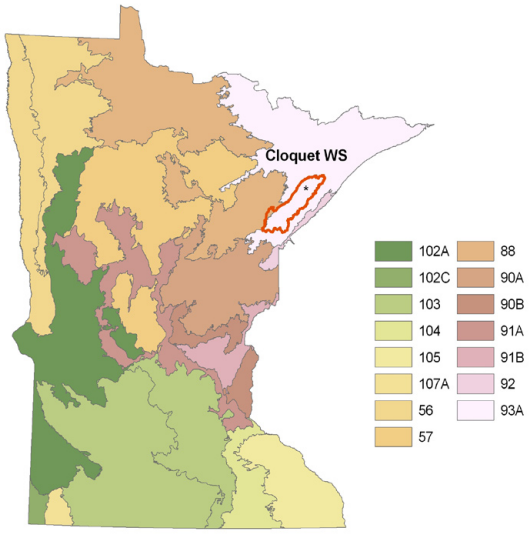


Listed Lake	Impairment	Affected Use
Katherine	Mercury	Aquatic Consumption
Cloquet	Mercury	Aquatic Consumption
Kane	Mercury	Aquatic Consumption
Pequaywan	Mercury	Aquatic Consumption
Salo	Mercury	Aquatic Consumption
Bassett	Mercury	Aquatic Consumption
Big Bear	Mercury	Aquatic Consumption
Little Alden	Mercury	Aquatic Consumption
Alden	Mercury	Aquatic Consumption
Wolf	Mercury	Aquatic Consumption
Wild Rice	Mercury	Aquatic Consumption
Island Lake Reservoir	Mercury	Aquatic Consumption
Boulder	Mercury	Aquatic Consumption
Caribou	Mercury	Aquatic Consumption
Fish Lake Flowage	Mercury	Aquatic Consumption
Leora	Mercury	Aquatic Consumption

Common Resource Areas

The Cloquet River Watershed encompasses two common resource areas, CRAs 88.1 and 93A.1[/9]

88.1 Northern Minnesota Glacial Lake Basins: Nearly level to gently sloping areas formed in lake washed till, lacustrine and organic soil material. Generally the soils are silty, clayey and loamy with small amounts of sandy and gravelly soils on beach ridges. Timber land is the main use. Scattered cropland and grazing land for beef and dairy are present. Cropland is used mostly for small grain, silage and hay. Resource concerns include management of excessive wetness, short growing season, pasture management, and water quality.



93A.1 Superior Upland Bedrock and Till Complex Gently sloping to very steep soils that generally formed in loamy, dense glacial till. Bedrock control is common and outcrops in many places, especially in the Boundary Water area. Bogs are common, both dysic and euic in reaction. Deciduous and coniferous forestland is the main land use. Small areas of cropland, pasture and hayland occur. Resource concerns are timber harvest management, wildlife habitat management, forage production, and riparian management timber harvest management, wildlife habitat management, forage production, and riparian management.

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

Geology / Soils[/10]

The soils within the Lake Superior watershed formed as a result of the weathering of unconsolidated materials derived from very deep to shallow glacial and organic deposits. This material has been subjected to climate and organisms as conditioned by relief over the last 14,000 years.

The relative proportions of soil types vary dramatically within the Lake Superior watershed mostly due to the depth to bedrock, slope gradient, geologic parent material and landscape position.

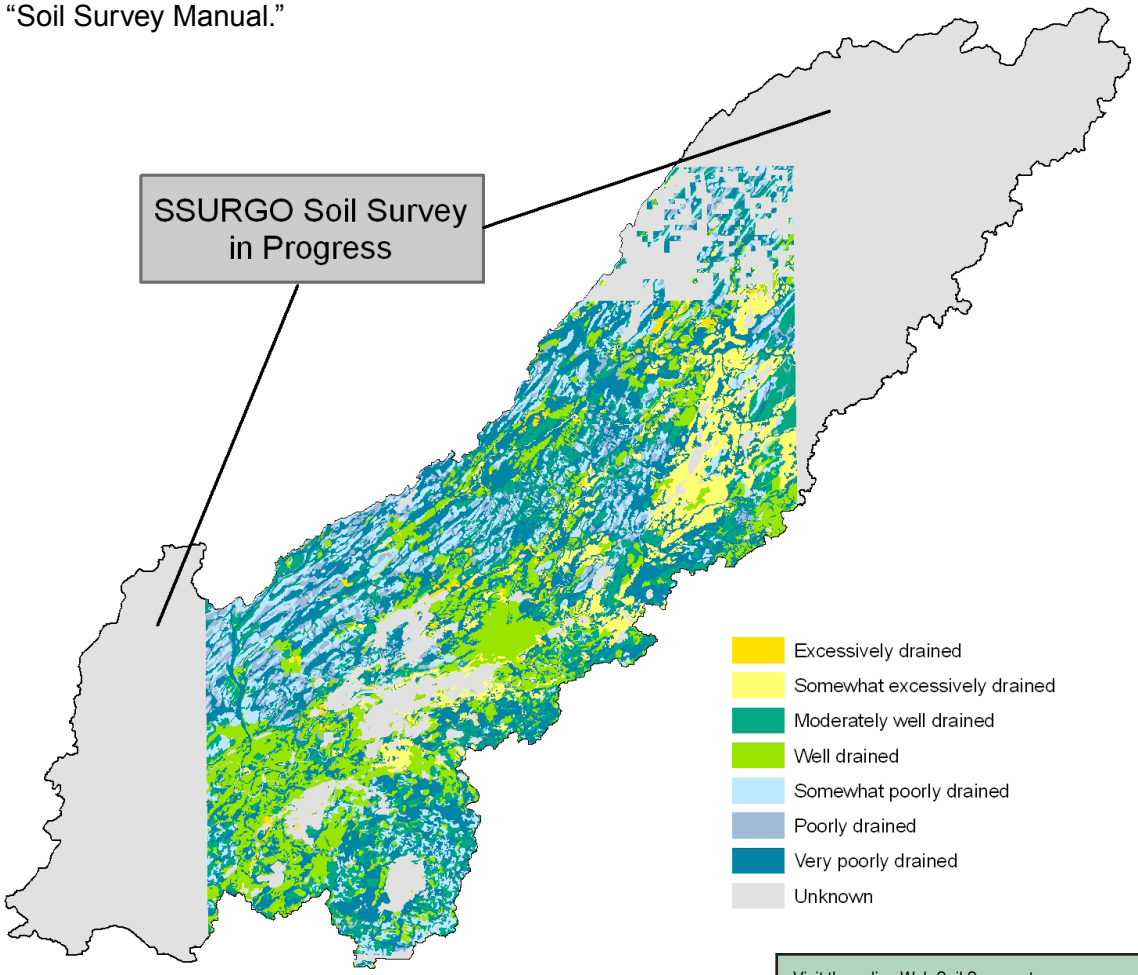
The major soils within the Cloquet River watershed are very deep, nearly level to sloping, on sandy glacial outwash plains. They are somewhat excessively to moderately well drained on summits and sideslopes, somewhat poorly drained on flat areas and poorly or very poorly drained in depressions. Natural fertility is low to moderate. The potential for surface erosion on steeper areas is moderately high. Minor soils are on dense-loamy glacial till moraines and drumlins on the borders of the outwash plains. Other minor soils are muck and peat in bogs.

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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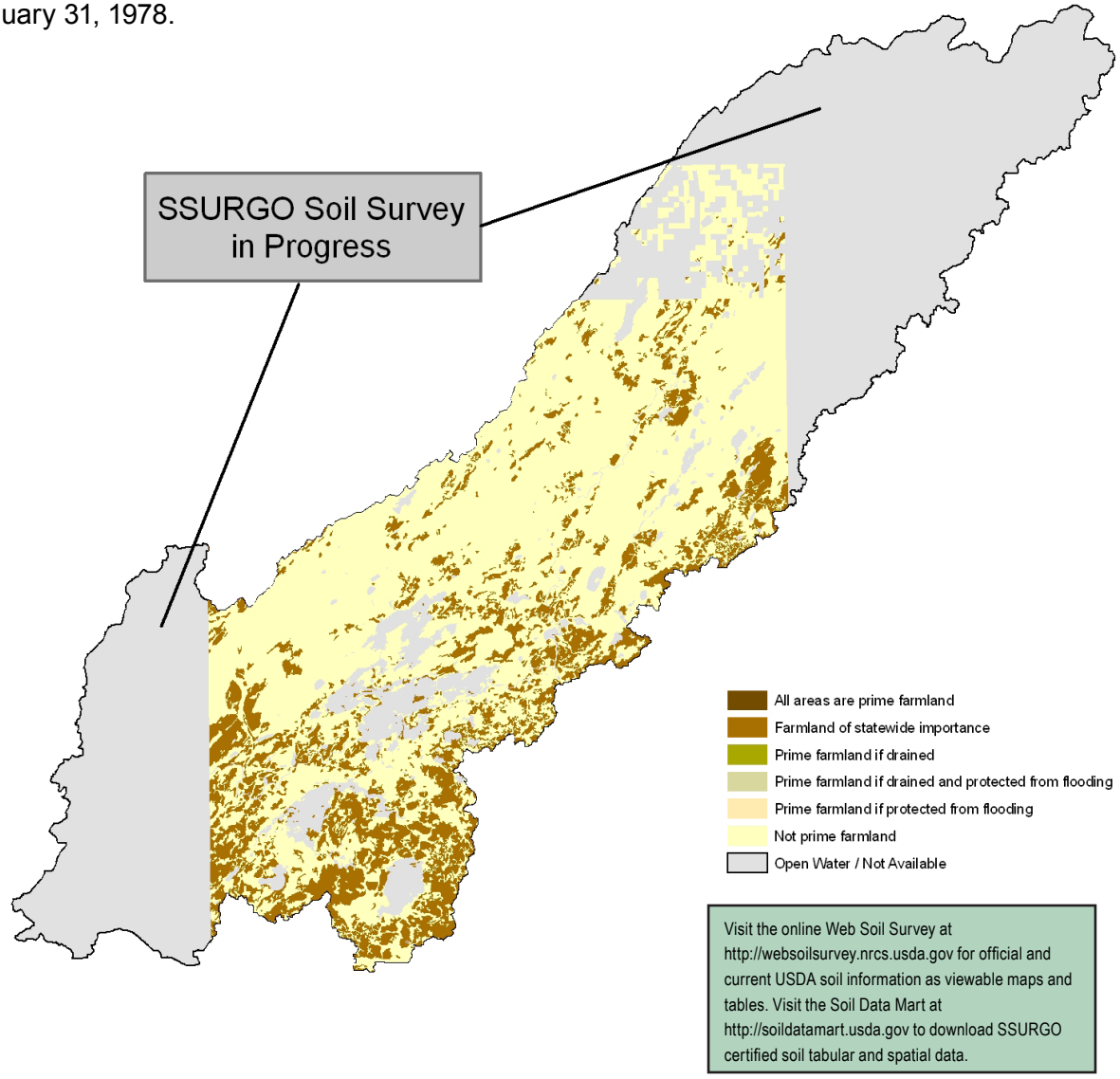
Farmland Classification

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.

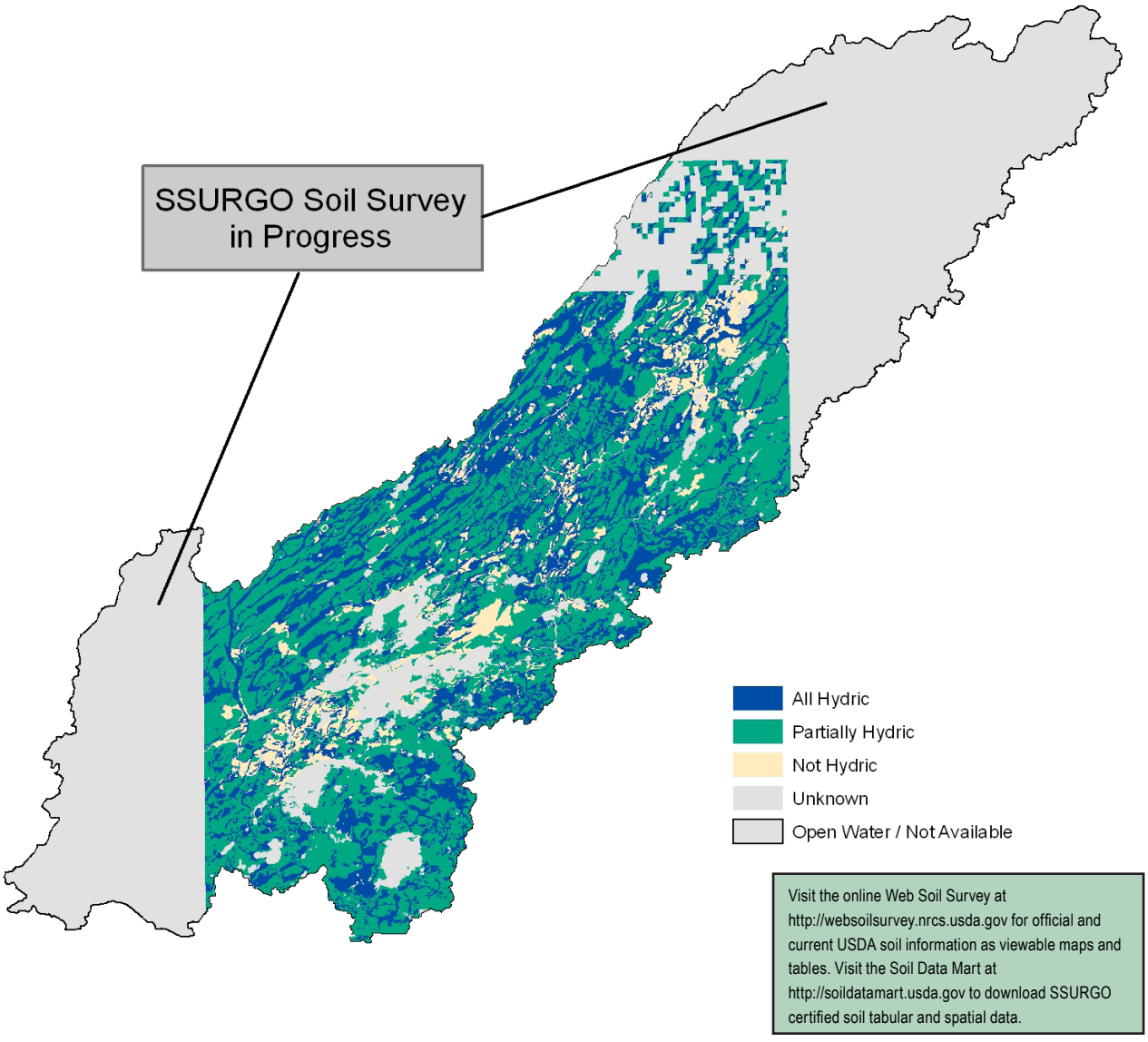
NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.



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.

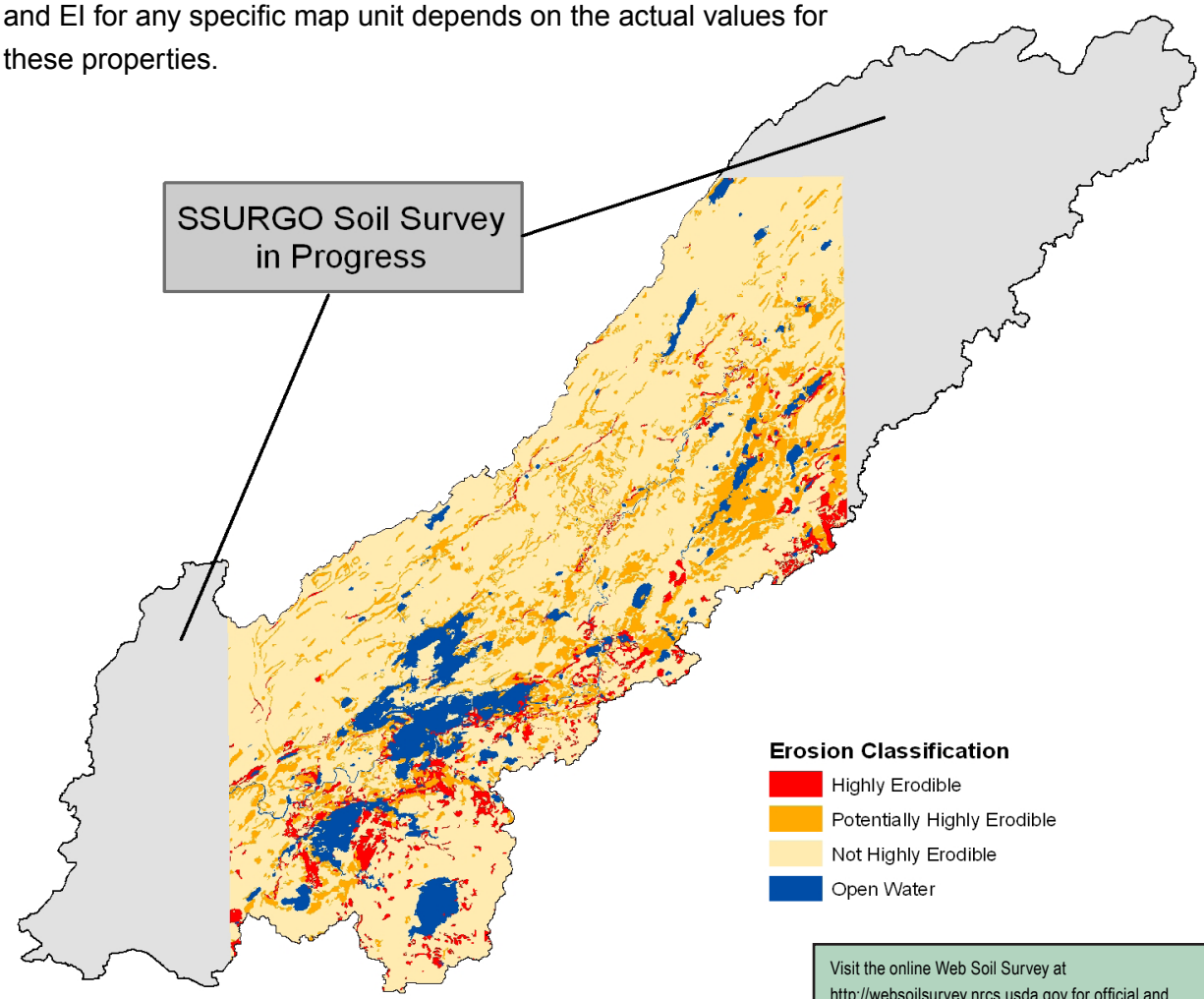


Highly Erodible Land (HEL)

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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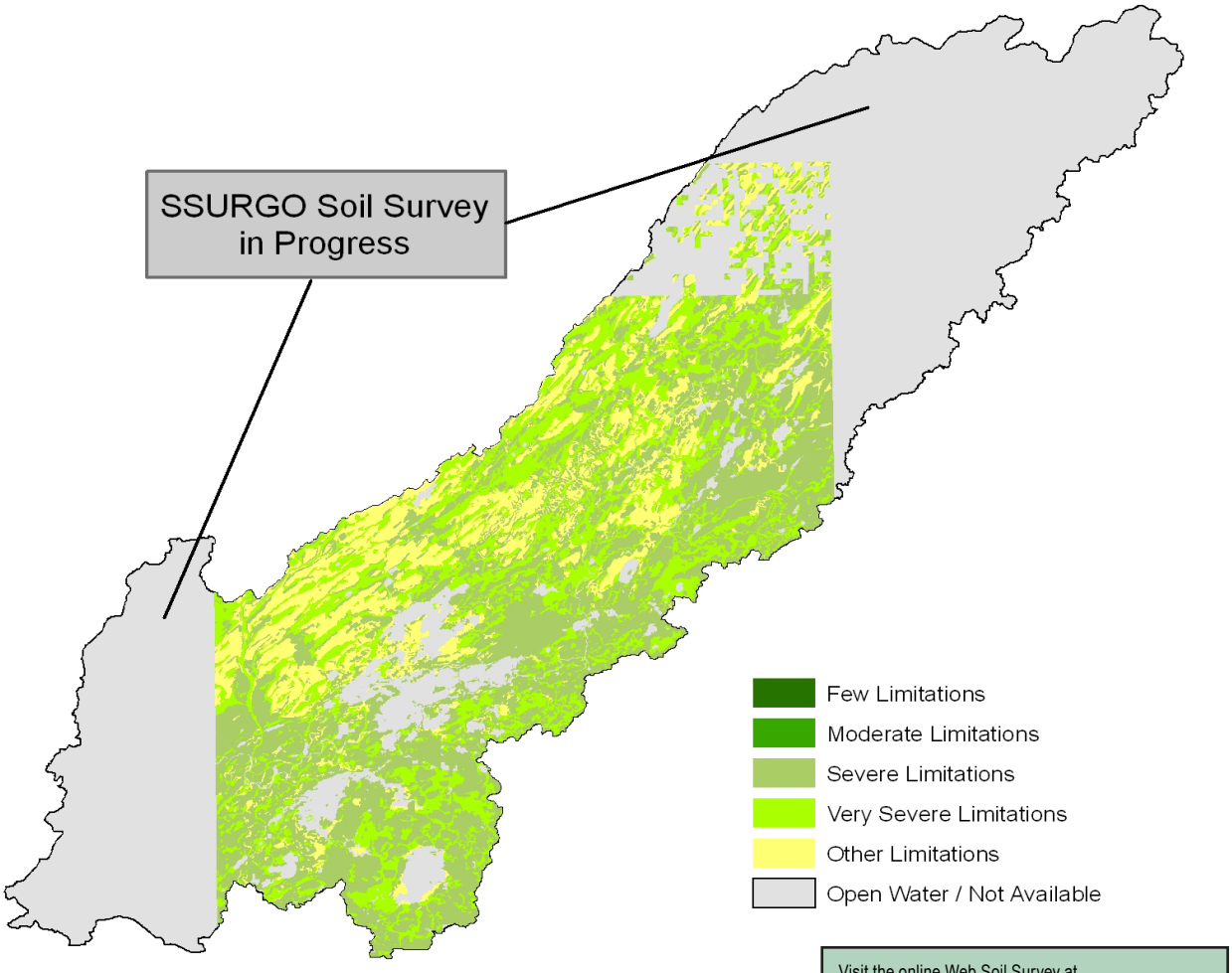
Land Capability Classification

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 Data

Watershed Name: Cloquet				Watershed Number: 04010101						
PRS Performance Measures	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	TOTAL
Total Conservation Systems Planned (acres)	0	0	0	9	0	N/A	0	395	0	404
Total Conservation Systems Applied (acres)	0	0	0	125	125	N/A	0	179	0	429
Conservation Practices										
Total Waste Management (313) (numbers)	0	0	0	0	0	0	0	0	0	0
Riparian Forest Buffers (391) (acres)	0	0	0	0	0	0	0	0	0	0
Erosion Control Total Soil Saved (tons/year)	0	0	0	0	0	N/A	N/A	N/A	N/A	0
Total Nutrient Management (590) (Acres)	0	0	0	0	0	0	0	0	0	0
Pest Management Systems Applied (595A) (Acres)	0	0	0	0	0	0	0	0	0	0
Prescribed Grazing 528a (acres)	0	0	0	0	0	0	0	0	0	0
Tree & Shrub Establishment (612) (acres)	0	1	0	15	1,258	72	0	10	0	1,356
Residue Management (329A-C) (acres)	0	0	0	0	0	0	0	0	0	0
Total Wildlife Habitat (644 - 645) (acres)	0	1	0	9	0	0	9	159	0	178
Total Wetlands Created, Restored, or Enhanced (acres)	0	0	0	0	0	0	0	0	0	0
Acres enrolled in Farmbill Programs										
Conservation Reserve Program	0	0	0	0	0	N/A	0	0	0	0
Wetlands Reserve Program	0	0	0	0	0	N/A	0	0	0	0
Environmental Quality Incentives Program	0	0	0	9	0	N/A	0	8	0	17
Wildlife Habitat Incentive Program	0	0	0	0	0	N/A	0	0	0	0
Farmland Protection Program	0	0	0	0	0	N/A	0	0	0	0

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:

- **Soil Quality, Excessive Erosion.** Soil erosion from exposed surface areas, streambank and lakeshore areas, and roadside erosion are major conservation issues in the watershed.

- **Thermal Pollution of Designated Waters.** Thermal pollution of designated trout water from beaver infestation is a major resource concern for Cloquet River tributary streams.

- **Woodland Management.** Management opportunities include planting trees or shrubs, timber stand improvement, timber sales, enhancing wildlife habitat, prescribed burning, control of invasive species, and other conservation measures

- **Surface Water Quality, Nutrients, Priority Pollutants.** Excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing a fish community with depressed populations and limited diversity. Mercury levels are affecting the health of Aquatic communities, and affecting the consumption of fish in many area lakes.

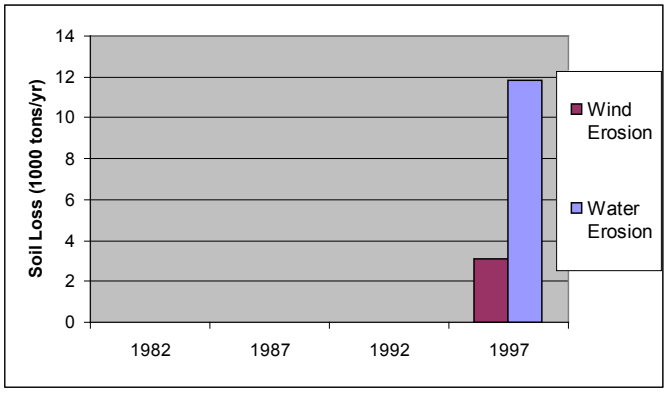
- **Surface / Groundwater Quality and Quantity.** Local districts seek to assist local government, landowners, and interest groups to make land and water use decisions regarding potential impacts to water quality and quantityin the face of growing land use changes.

- **Stormwater Management.** Local districts recognize that runoff volume will likely increase as development of the watershed continues. Districts seek to require that peak runoff rates be kept below the capacity of downstream conveyance facilities through the use of retention facilities.

- **Wetland Management.** Area groups recognize that development and logging have had major impacts on wetlands. Physical changes have taken place, wildlife and plant species composition have been altered, greatly changing the function and value of the areas plentiful wetlands.

NRI Erosion Estimates

• NRI Erosion estimates were not reported by Hydrologic Unit Code for this basin between 1982 and 1992. 1997 Erosion estimates for sheet and rill erosion on the cropland indicate a loss of 11,800 tons, and wind erosion was estimated at 3,100 tons. /13



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, candidate species and species of special concern that occur in the basin.

Scientific Name	Common Name	Type
Allium schoenoprasum var. sibiricum	Wild Chives	Botanical
Botrychium lanceolatum	Triangle Moonwort	Botanical
Botrychium lunaria	Common Moonwort	Botanical
Botrychium minganense	Mingan Moonwort	Botanical
Botrychium rugulosum	St. Lawrence Grapefern	Botanical
Botrychium simplex	Least Moonwort	Botanical
Callitriche heterophylla	Larger Water-starwort	Botanical
Carex flava	Yellow Sedge	Botanical
Carex michauxiana	Michaux's Sedge	Botanical
Claytonia caroliniana	Carolina Spring-beauty	Botanical
Clemmys insculpta	Wood Turtle	Zoological
Eleocharis nitida	Neat Spike-rush	Botanical
Erebia disa mancinus	Disa Alpine	Zoological
Haliaeetus leucocephalus	Bald Eagle	Zoological
Juncus stygius var. americanus	Bog Rush	Botanical
Lasmigona compressa	Creek Heelsplitter	Zoological
Littorella uniflora	American Shore-plantain	Botanical
Lobaria quercizans	Smooth lungwort	Botanical
Lycaeides idas nabokovi	Nabokov's Blue	Zoological
Oxyethira itascae	A Caddisfly	Zoological
Platanthera clavellata	Club-spur Orchid	Botanical
Potamogeton vaseyi	Vasey's Pondweed	Botanical
Pyrgus centaureae freija	Grizzled Skipper	Zoological
Rhynchospora fusca	Sooty-colored Beak-rush	Botanical
Rubus chamaemorus	Cloudberry	Botanical
Salix pellita	Satiny Willow	Botanical
Sparganium glomeratum	Clustered Bur-reed	Botanical
Sterna hirundo	Common Tern	Zoological
Torreyochloa pallida	Torrey's Manna-grass	Botanical
Tsuga canadensis	Eastern Hemlock	Botanical
Waldsteinia fragarioides	Barren Strawberry	Botanical
Xyris montana	Montane Yellow-eyed Grass	Botanical

Socioeconomic and Agricultural Data (Relevant)

Estimations for the Cloquet River subbasin indicate a current population of approximately 10,305 people. Median household income throughout the district is $48,375 yearly, roughly 104% of the national average. Unemployment is estimated at 4.5%, and approximately 9% of the residents in the watershed live below the national poverty level.

Assessment estimates indicate 94 farms located in the watershed. Approximately sixty six percent of the operations are less than 180 acres in size, thirty three percent are from 180 to 1000 acres in size, and the remaining farms are larger than 1000 acres. Of the ninety operators in the basin, fifty two percent are full-time producers not reliant on off-farm income.

	(MN) HUC# 4010202	Total Acres:	507,862
Population Data*	Watershed Population	10,305	
	Unemployment Rate	4.5%	
	Median Household Income	48,375	
	% below poverty level	9%	
	Median Value of Home	75,100	
Farms	# of Farms	94	
	# of Operators	90	**Percent**
	# of Full Time Operators	47	52%
	# of Part Time Operators	43	48%
	Total Crop/Pasturelands:	**12,289**	2.4%
Farm Size	1 to 49 Acres	25	26%
	50 to 179 Acres	38	40%
	180 to 499 Acres	26	27%
	500 to 999 Acres	5	6%
	1,000 Acres or more	1	1%
Livestock & Poultry	Cattle - Beef	536	22%
	Cattle - Dairy	116	5%
	Chicken	332	14%
	Swine	54	2%
	Turkey	11	0%
	Other	1,354	56%
	Animal Count Total:	**2,404**	
	Total Permitted AFOs:	**23**	
Chemicals (Acres Applied)	Insecticides	539	
	Herbicides	4,300	
	Wormicides	0	
	Fruiticides	44	
	Total Acres Treated	**4,883**	
	% State Chemical Totals	**0.0%**	

* 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

- **Cloquet River Biological Assessment**
  1854 Authority, Fond du Lac Resource Management
- **Miller Creek Diagnostic Study and Imp. Plan,**
  South St Louis County SWCD, MPCA
- **Superior Lakewatch**
  Sponsored by Great Lakes Aquarium
- **St. Louis River Area of Concern**
  MPCA, WDNR, US EPA
- **Historic Land Use Reconstruction Project**
  Minnesota Pollution Control Agency, SLRCAC
- **Lake Superior Shoreline Stabilization Project**
  Minnesota Board of Water and Soil Resources
- **Western Lake Superior NEMO Project**
  University of MN, Great Lakes Commission
- **Weber Stream Restoration Initiative**
  NRRI, U of M, MPCA, ARDC, BWSR, USDA
- **LSSA Treeplanting Project**
  Lake Superior Steelhead Association
- **Miller Creek Habitat Restoration Project**
  Great Lakes Commission
- **Watershed Guardian Program**
  St. Louis River Citizens Action Committee, Cargill Inc.
- **Lester River:Forest Legacy Program Appropriation**
  USDA Forest Legacy Program, Nature Conservancy
- **Beaver River Watershed Wetlands Project**
  NRRI, Minnesota's Lake Superior Coastal Program
- **Stormwater Pollution Prevention in Urban Watersheds**
  South St Louis County SWCD, City of Duluth
- **Knife River Forest Stewardship Program**
  USDA, St Louis County SWCD
- **Spawning & Adult Summer Habitat Study: Cloquet River**
  Minnesota Cooperative Fish and Wildlife Research Unit

*** 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

- **Natural Resources Research Institute**
  5013 Miller Trunk Highway Duluth, MN 55811
  Phone (218) 720-4294
- **Lake Superior Streams**
  www.lakesuperiorstreams.org
- **Laurentian Resource Conservation and Development Council**
  4850 Miller Trunk Hwy, Suite 2A Duluth, MN 55811
  Phone (218) 720-5225
- **Environmental Assn. for Great Lakes Education**
  394 Lake Ave So. Suite #222 Duluth, MN 55802
  Phone (218) 726-1828
- **The Nature Conservancy**
  394 S Lake Ave # 308 Duluth, MN 55802
  Phone (218) 727-6119
- **Lake County SWCD**
  601 3rd Ave, PO Box 14, Two Harbors, MN 55616
  Phone (218) 834-8370
- **Western Lake Superior Sanitary District (WLSSD)**
  2626 Courtland Street Duluth, MN 55806
  Phone (218) 722-3336
- **Minnesota Sea Grant**
  2305 E 5th Street Duluth, MN 55805
  Phone (218) 726-8106
- **Superior Lakewatch**
  6008 London Rd. Duluth, Minnesota 55804
  Phone (218) 525-2265
- **North Shore Management Board c/o ARDC**
  221 W 1st St. Duluth, MN 55802
  Phone 1-800-232-0707
- **Great Lakes Commission**
  2805 S. Ind. Hwy, Suite 100 Ann Arbor, MI 48104
  Phone: (734) 971-9135
- **Arrowhead Region Development Commission**
  221 West 1st Street Duluth, MN 55802
  Phone (218) 722-5545
- **North St Louis SWCD**
  307 First St S Suite 114, Virginia, MN 55792
  Phone (218) 742-9504
- **South St Louis SWCD**
  215 No 1st Ave E Rm 301, Duluth, MN 55802
  Phone (218) 723-4867

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. U.S. Geological Survey National Hydrography Dataset (NHD) 1:100,000-scale Digital Line Graph (DLG) medium resolution hydrography data, integrated with reach-related information from the U.S. Environmental Protection Agency Reach File Version 3.0 (RF3). 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.

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/easementsummary.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/. 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.