

Rapid Watershed Assessment

St. Louis River

(MN) HUC: 04010201



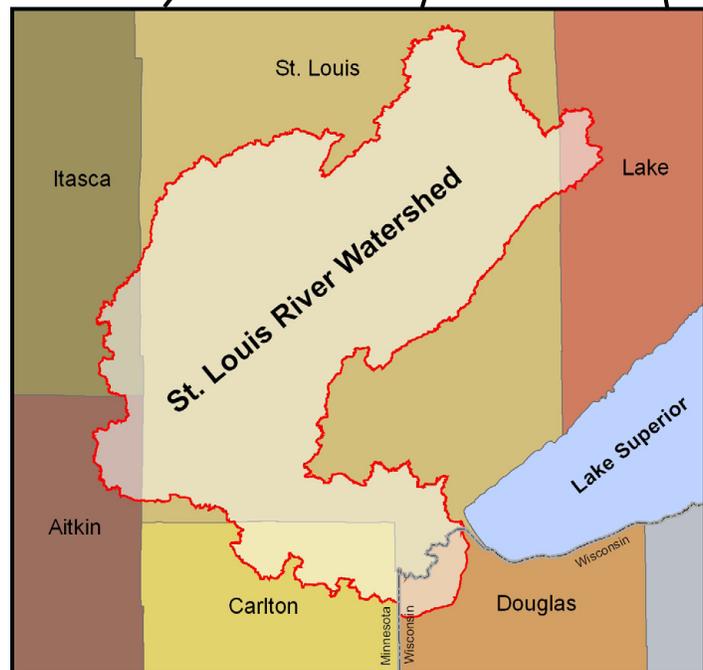
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best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

Introduction

The St. Louis 8-Digit Hydrologic Unit Code (HUC) subbasin is located in the Northern Lakes and Forest ecoregion of Minnesota. This largely forested watershed is 1,872,807 acres in size. Approximately thirty eight percent of the land in this HUC is privately owned, and the remainder is tribal, conservancy, state or federally owned land or held by corporate interests.

Assessment estimates indicate 550 farms located in the watershed. Approximately sixty two percent of the operations are less than 180 acres in size, thirty seven percent are from 180 to 1000 acres, and the remaining farms are greater than 1000 acres. Of the 531 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, groundwater quality and quantity, surfacewater quality and quantity, timberland management, storwater management, and contaminated sediment clean-up. Associated with the erosion runoff and stormwater issues are increased sediment and pollutant (Mercury, PCBs, Bioaccumulative Toxins) loadings to surface waters.



County Totals

| County | Acres in HUC | % HUC |
|---------------------|---------------------|--------------|
| St. Louis | 1,577,919 | 84.3% |
| Lake | 30,093 | 1.6% |
| Itasca | 51,493 | 2.7% |
| Aitkin | 45,642 | 2.4% |
| Carlton | 123,621 | 6.6% |
| Douglas (WI) | 44,039 | 2.4% |
| Total acres: | 1,872,807 | 100% |

Physical Description

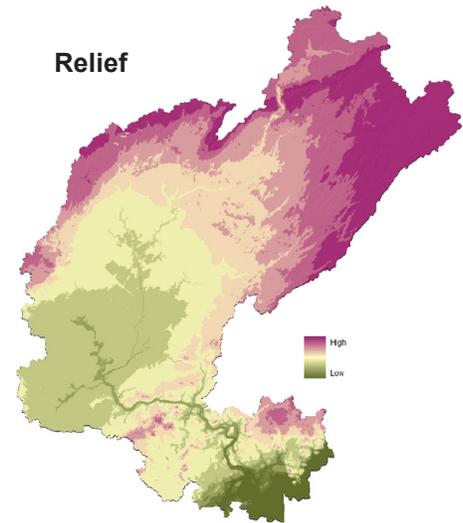
Elevation in the St. Louis subbasin ranges from 1469 feet above mean sea level (msl) at the headwaters of the St. Louis River near Hoyt Lakes, to 1204 feet in Cloquet, and 1049 feet in Duluth where the river forms a unique 12,000 acre freshwater estuary before flowing into Lake Superior.

Precipitation in the watershed ranges from 25 to 31 inches annually. Evaporation estimates are between 28 to 32 inches annually (Farnworth et al., 1982, Minnesota State Climatologists Office, 1999).

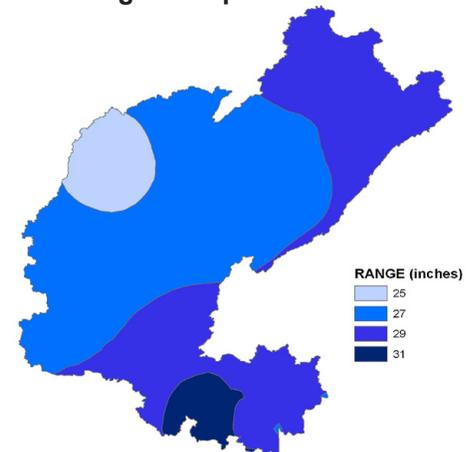
Much of the land within this HUC is not considered highly erodible, and is moderately suited to agricultural uses. Predominate land uses / land covers are Forest (57.0%), Wetlands (23.5%), Grass Pasture/Hay (6.7%), and Shrubland (5.6%).

Land use within the watershed is modestly agricultural, accounting for approximately 7% of the available acres. Development pressure is moderate, with some farms, timberland, resorts and lakeshore being parceled out for recreation, lake or country homes.

Relief

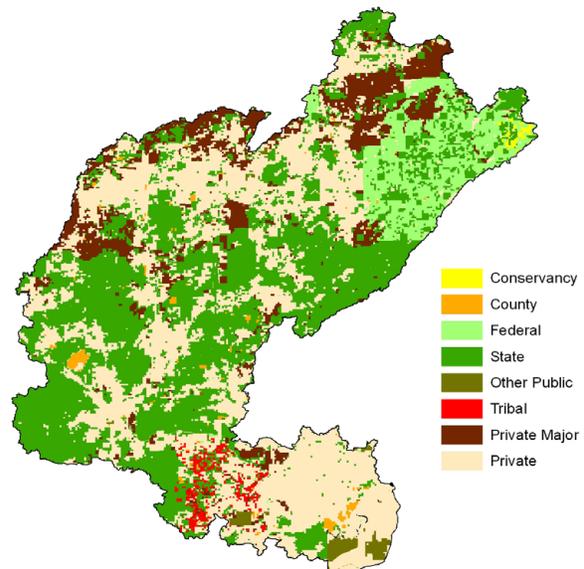


Average Precipitation



Ownership

| Ownership Type | Acres | % of HUC |
|---------------------|------------------|------------|
| Conservancy | 4,435 | 0.2 |
| County | 18,059 | 1.0 |
| Federal | 143,503 | 7.7 |
| State | 747,762 | 39.9 |
| Other | 20,939 | 1.1 |
| Tribal | 22,423 | 1.2 |
| Private Major | 198,630 | 10.6 |
| Private | 716,904 | 38.3 |
| Total Acres: | 1,872,655 | 100 |

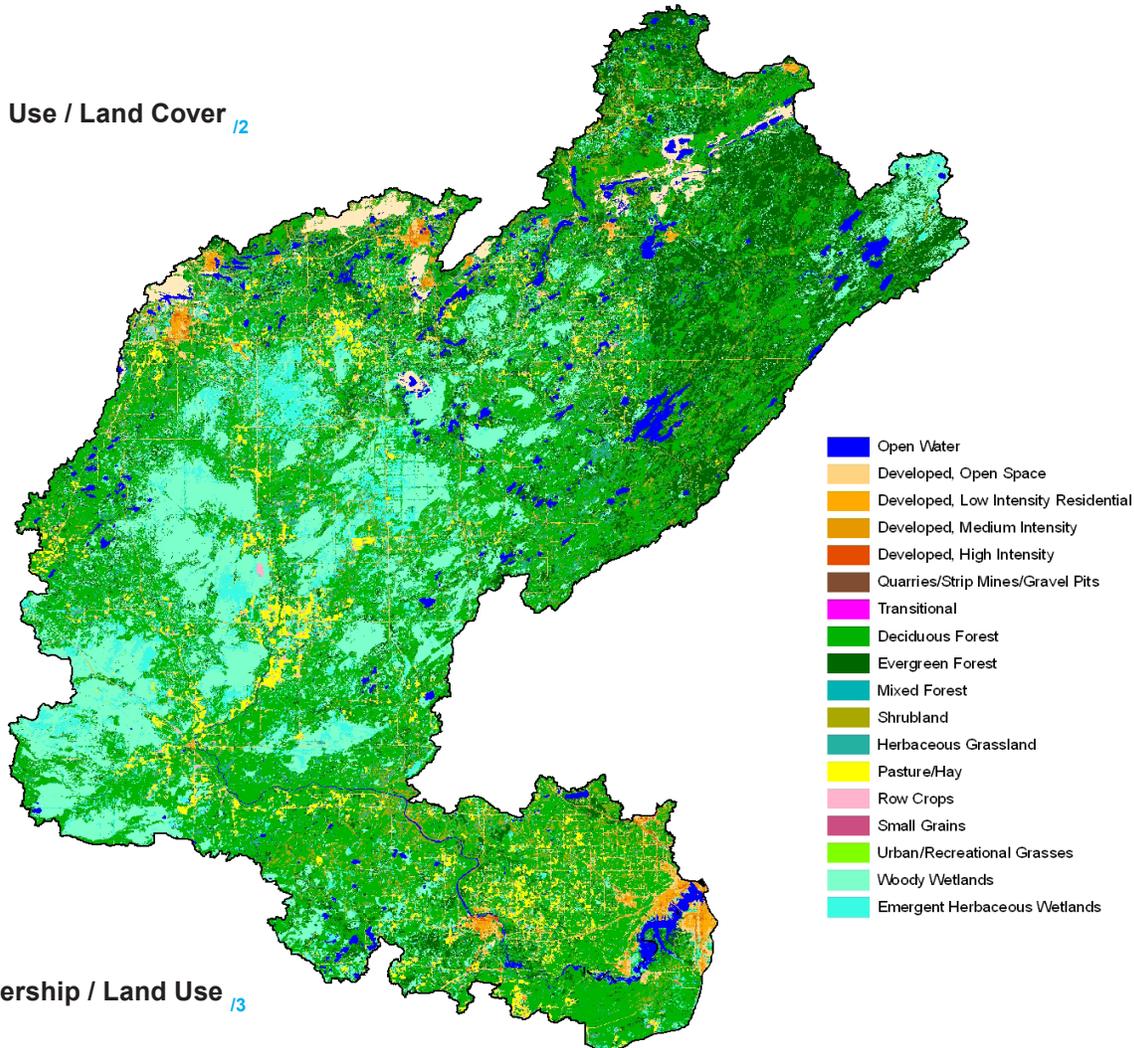


* Ownership totals derived from 2007 MN DNR GAP Stewardship Coverage data and are the best suited estimation of land stewardship available on a statewide scale at time of publication. See the bibliography section of this document for further information.

Ownership / Land Use

The watershed covers an area of 1,872,655 acres. Slightly less than forty percent of the land in the watershed is State owned (747,762 acres). The second largest ownership type is Private, with approximately 416,904 acres (38.3%), followed by Private-Major, with 198,630 acres (10.6%), Federal with 143,503 acres (7.7%), and Tribal with 22,423 acres (1.2%), Miscellaneous Public lands amounting to 20,939 acres (1.1%), and County with 18,059 acres (1.0%). Conservancy lands account for the smallest ownership percentage, covering 4,435 acres (0.2%). Land use by ownership type is represented in the table below.

Land Use / Land Cover ^{1/2}



Ownership / Land Use ^{1/3}

| Landcover/Use | Public | | Private** | | Tribal | | Total Acres | Percent | |
|--------------------------|---------|----------------|---------------|----------------|--------------|---------------|-------------|------------------|-------------|
| | Acres | % Public | Acres | % Private | Acres | % Tribal | | | |
| Forest | 545,061 | 29.1% | 505,689 | 27.0% | 15,968 | 0.9% | 1,066,718 | 57.0% | |
| Grass, etc | 21,498 | 1.1% | 102,413 | 5.5% | 677 | 0.0% | 124,589 | 6.7% | |
| Orchards | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | |
| Row Crops | 1,293 | 0.1% | 7,416 | 0.4% | 20 | 0.0% | 8,729 | 0.5% | |
| Shrub etc | 31,615 | 1.7% | 71,046 | 3.8% | 1,552 | 0.1% | 104,213 | 5.6% | |
| Wetlands | 307,766 | 16.4% | 130,146 | 6.9% | 2,846 | 0.2% | 440,758 | 23.5% | |
| Residential/Commercial | 8,009 | 0.4% | 61,249 | 3.3% | 574 | 0.0% | 69,831 | 3.7% | |
| Open Water* | 14,673 | 0.8% | 42,329 | 2.3% | 784 | 0.0% | 57,786 | 3.1% | |
| Watershed Totals: | | 929,915 | 49.66% | 920,288 | 49.1% | 22,421 | 1.2% | 1,872,655 | 100% |

* ownership undetermined

** includes private-major

Physical Description (continued)

| | | | | cu. ft/sec | |
|--|--|---|-----------------------------|----------------------|------|
| Stream Flow Data | USGS 04024000 ST. LOUIS RIVER NEAR SCANLON, MN | Total Avg. | | | 2024 |
| | | May – Sept. Avg. Yield | | | 2052 |
| Stream Data¹⁴ (*Percent of Total HUC Stream Miles) | | MILES | PERCENT | | |
| | Total Miles – Major (100K Hydro GIS Layer) | 3,345 | --- | | |
| | 303d/TMDL Listed Streams (DEQ) | 243.0 | 7.3% | | |
| Riparian Land Cover/Land Use¹⁵ (Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer) | Land Use Type | Acres | Percent | | |
| | Forest | 35,148 | 55.3% | | |
| | Grain Crops | 0 | 0.0% | | |
| | Grass, etc | 3,055 | 4.8% | | |
| | Orchards | 0 | 0.0% | | |
| | Row Crops | 334 | 0.5% | | |
| | Shrub etc | 2,576 | 4.1% | | |
| | Wetlands | 14,744 | 23.2% | | |
| | Residential/Commercial | 2,001 | 3.2% | | |
| | Open Water* | 5,675 | 8.9% | | |
| | | Total Buffer Acres: | 63,533 | 100% | |
| Crop and Pastureland Land Capability Class¹⁶ (Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only) | 1 – slight limitations | 0 | 0% | | |
| | 2 – moderate limitations | 50,100 | 42.4% | | |
| | 3 – severe limitations | 28,800 | 24.37% | | |
| | 4 – very severe limitations | 29,400 | 24.9% | | |
| | 5 – no erosion hazard, but other limitations | 0 | 0% | | |
| | 6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest | 9,900 | 8.38% | | |
| | 7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat | 15,000 | 12.7% | | |
| | 8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply | 0 | 0% | | |
| | | Total Croplands & Pasturelands | 118,200 | --- | |
| | TYPE OF LAND | ACRES | % of Irrigated Lands | % of Cropland | |
| Irrigated Lands¹⁷ (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.

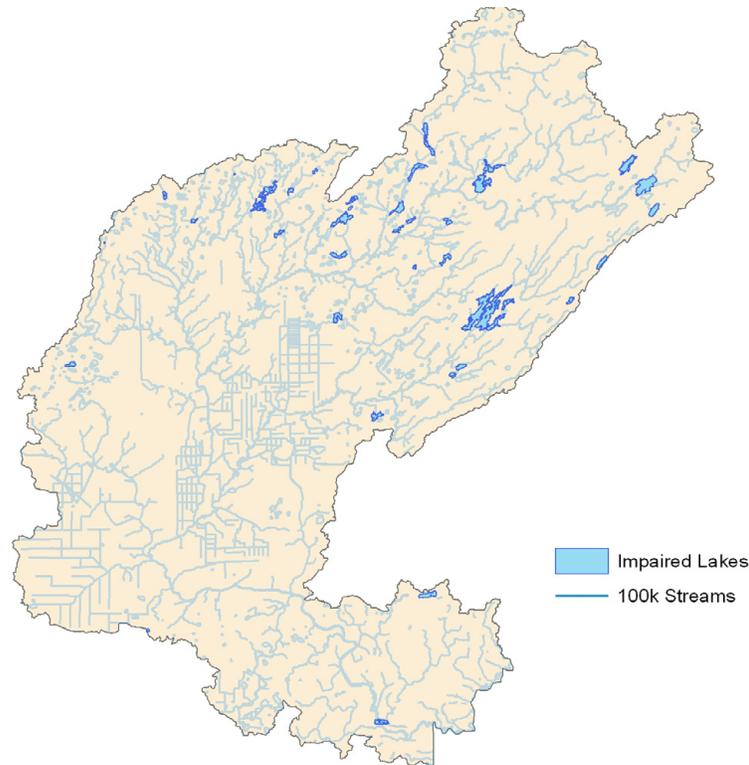
2006 Minnesota 303d Listed Streams - St Louis Watershed



| Listed Stream / Reach ⁸ | Impairment | Listed Stream / Reach | Impairment |
|---|-----------------------|---|--------------------|
| St. Louis River; Swan R to Whiteface R | Mercury | St. Louis River; Thomson Reservoir to Fond du Lac Dam | Mercury |
| St. Louis River; Partridge R to Embarrass R | Mercury | St. Louis River; Knife Dam to Pottlatch Dam | Mercury |
| St. Louis River; Cloquet R to Pine R | Mercury | St. Louis River; Swan R to Whiteface R | Mercury |
| St. Louis River; Stoney Bk to Cloquet R | Mercury | St. Louis River; Partridge R to Embarrass R | Mercury |
| St. Louis River; Artichoke R to Stoney Bk | Mercury | St. Louis River; Headwaters to end of Wild Rice portion | Mercury |
| St. Louis River; East Savanna R to Artichoke R | Mercury | St. Louis River; Headwaters to end of Wild Rice portion | Mercury |
| St. Louis River; Floodwood R to East Savanna R | Mercury | St. Louis River; End Wild Rice portion to Partridge R | Mercury |
| St. Louis River; Whiteface R to Floodwood R | Mercury | Whiteface River; Bug Cr to Paleface R | Mercury |
| Whiteface River; Paleface R to St. Louis R | Mercury | Whiteface River; Whiteface Reservoir to Bug Cr | Mercury |
| St. Louis River; Two R to Swan R | Mercury | St. Louis River; East Two R to West Two R | Mercury |
| St. Louis River; Embarrass R to Two R | Mercury | St. Louis River; Pottlatch Dam to Scanlon Dam | Mercury |
| Miller Creek; Headwaters to mouth | Fish IBI, Temperature | St. Louis River; Thomson Reservoir to Fond du Lac Dam | Mercury |
| St. Louis River; Scanlon Dam to Thomson Reservoir | Mercury | St. Louis River; Pine R to Knife Dam | Mercury |
| St. Louis River; Pine R to Knife Dam | Mercury | St. Louis River; Fond du Lac Dam to Mission Cr | BAT, Mercury, PCBs |
| St. Louis River; Oliver Bridge to Pokegama R | Mercury, PCBs | St. Louis River; Mission Cr to Oliver Bridge | BAT, Mercury, PCBs |
| St. Louis River; End Wild Rice portion to Partridge R | Mercury | | |

Assessment of Waters (continued)

2006 Minnesota 303d Listed Lakes - St Louis Watershed



| Listed Lake | Impairment | Affected Use | Listed Lake | Impairment | Affected Use |
|---------------------|------------|---------------------|-------------|------------|---------------------|
| Thomson Reservoir | Mercury | Aquatic Consumption | Pike | Mercury | Aquatic Consumption |
| Beauty | Mercury | Aquatic Consumption | Embarrass | Mercury | Aquatic Consumption |
| Pine | Mercury | Aquatic Consumption | Strand | Mercury | Aquatic Consumption |
| Seven Beaver | Mercury | Aquatic Consumption | Bass | Mercury | Aquatic Consumption |
| Big | Mercury | Aquatic Consumption | Lost | Mercury | Aquatic Consumption |
| Cadotte | Mercury | Aquatic Consumption | Coe | Mercury | Aquatic Consumption |
| Otto | Mercury | Aquatic Consumption | Esquagama | Mercury | Aquatic Consumption |
| Linwood | Mercury | Aquatic Consumption | Murphy | Mercury | Aquatic Consumption |
| Colby | Mercury | Aquatic Consumption | Pleasant | Mercury | Aquatic Consumption |
| Whiteface Reservoir | Mercury | Aquatic Consumption | Ely | Mercury | Aquatic Consumption |
| Whitewater | Mercury | Aquatic Consumption | Silver | Mercury | Aquatic Consumption |
| Upper Comstock | Mercury | Aquatic Consumption | Virginia | Mercury | Aquatic Consumption |
| Lower Comstock | Mercury | Aquatic Consumption | Deep | Mercury | Aquatic Consumption |
| North Twin | Mercury | Aquatic Consumption | Elbow | Mercury | Aquatic Consumption |
| South Twin | Mercury | Aquatic Consumption | Mashkenode | Mercury | Aquatic Consumption |
| Loon | Mercury | Aquatic Consumption | Six Mile | Mercury | Aquatic Consumption |
| Wynne/Sabin | Mercury | Aquatic Consumption | Moberg | Mercury | Aquatic Consumption |
| Forsyth Pit | Mercury | Aquatic Consumption | Longyear | Mercury | Aquatic Consumption |
| Gilbert Pit | Mercury | Aquatic Consumption | Kelly | Mercury | Aquatic Consumption |
| W. Two Rivers Res. | Mercury | Aquatic Consumption | | | |

Common Resource Areas

The St. Louis Watershed encompasses five common resource areas, CRAs 93A.1, 92.1, 90A.1, 88.1, and 57.1 ^{/9}

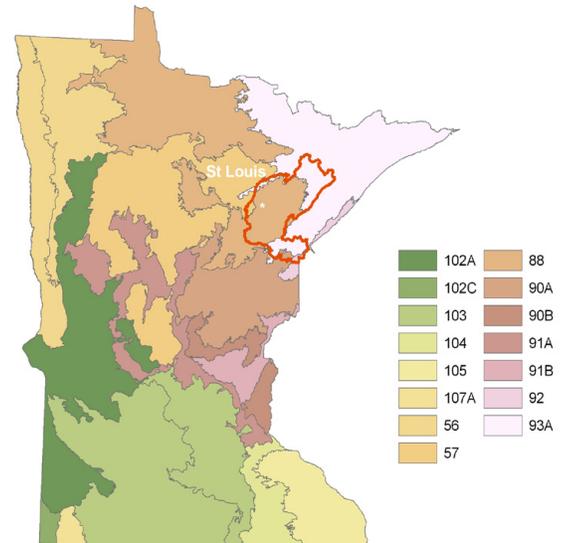
57.1 - Northern Minnesota Till Moraine: Rolling glacial moraine and associated outwash with short, choppy and complex slopes. Soils are generally loamy with some clayey and sandy soils included. Organic soils occur in depressions. Land use is cropland, pasture timber and recreation. Numerous lakes occur in this region. Main crops are small grain, soybeans and forage crops. Resource concerns include improved drainage for crop production, grazing management of forest and grassland, water and wind erosion and water quality impacts.

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.

90A.1 - Loamy Till Ground Moraines and Drumlins: Nearly level to moderately steep, loamy, sandy, and organic soils. Mixed deciduous and coniferous forest is the primary land use with some glacial lakes and wetlands. Scattered cropland and grazing land are present. Cropland productivity is limited by the short length of the growing season. Primary resource concerns are timber management, wildlife habitat, recreation and agricultural forage production. Surface water quality is a localized concern.

92.1 - Lake Superior Clay Plain: Gently sloping to steep, clayey and loamy lakebed deposits with deep v-shaped ravines. Well drained to somewhat poorly drained clayey soils with some organic soils. Mixed deciduous and coniferous forest predominate, with significant areas of forage based cropland and grazing land. Primary resource concerns are forestland, cropland productivity, wetland habitat restoration, erosion control on deeply incised streams along with urban expansion.

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 eucic 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.



Only the major CRA units are described above.

 For further information, go to:

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

Geology / Soils ^{/10}

Bedrock in the watershed is largely a variety of Precambrian volcanic, metamorphosed sedimentary, and intrusive rocks. The geology of the upper portion of the St. Louis watershed is significant for the entire basin because it is this area where the famous Iron Range mines are located. The central St. Louis River watershed is fairly flat and the river drains extensive peatlands. As it nears its estuary and Lake Superior in the vicinity of Jay Cooke State Park, the river is surrounded by imposing cliffs and angular outcropping of gray rock.

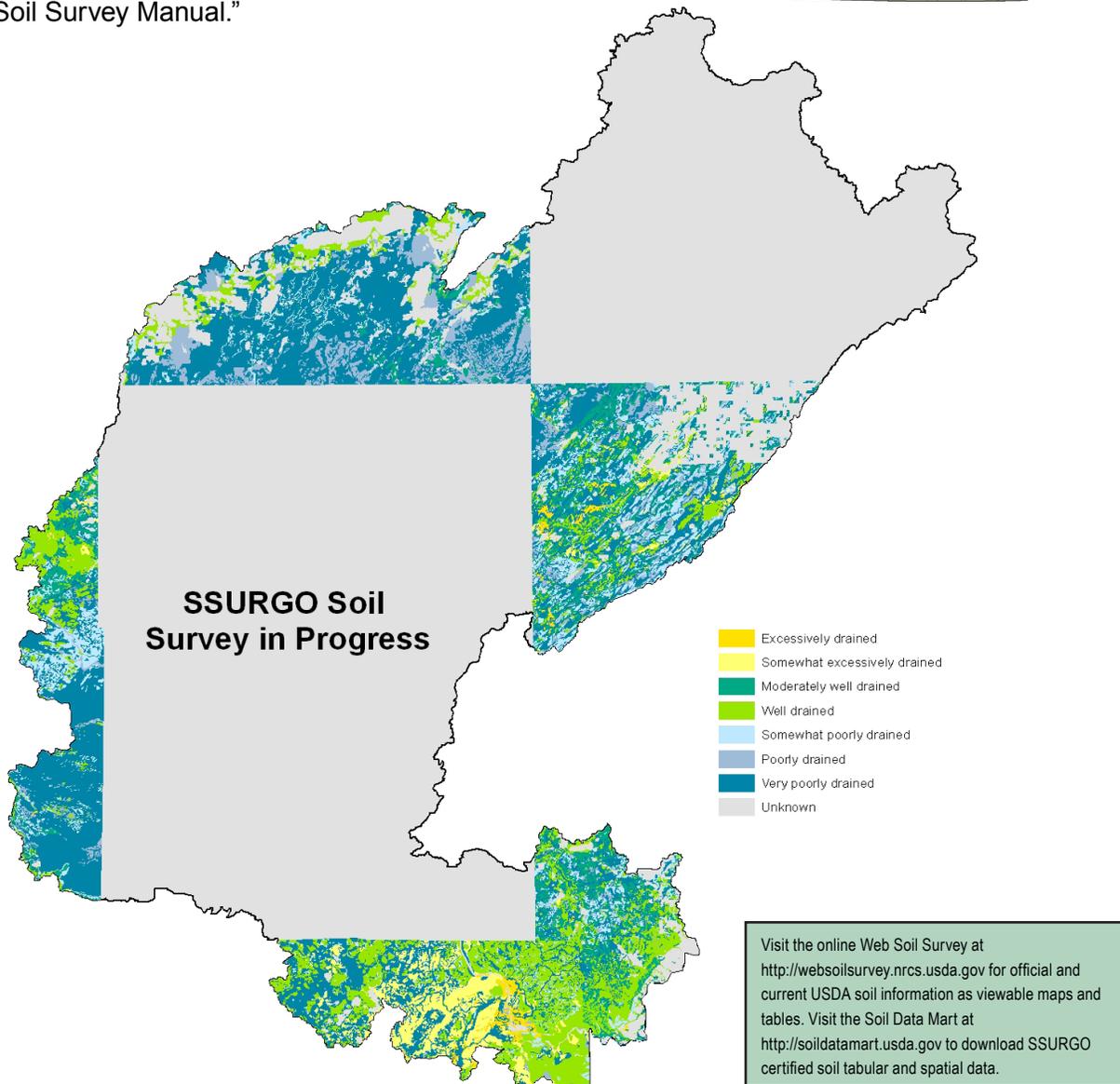
Fine-grained glacial lake deposits of sand, silt, and clay, and extensive post-glacial peat deposits are predominant in the western half of the watershed. The presence of drumlins (elongate hills) in the bouldery-till area is accentuated by the distribution of till and peat. Drift in the northeastern part of the watershed is generally less than 100 feet thick.

Surficial outwash in the southeastern and east-central parts of the watershed is typically medium to coarse sand and gravel. Test augering indicates saturated thicknesses of as much as 35 feet in the southeastern part, whereas in the east-central part, the gravel is too coarse to penetrate. Thick drift in the extreme southeastern part is largely glacial lake silts and clays. Saturated glacial-lake sands are commonly less than 10 feet thick.

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.”

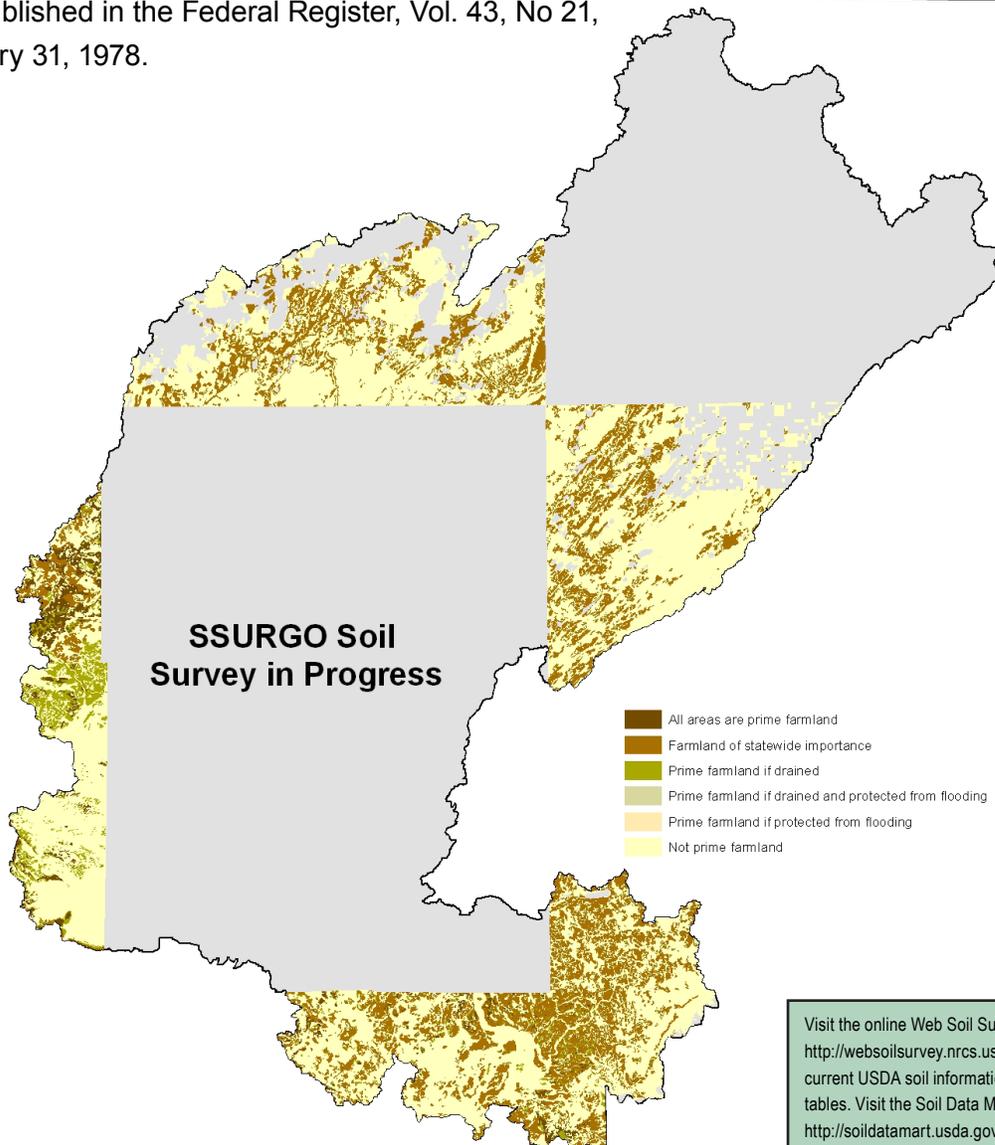


Farmland Classification

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

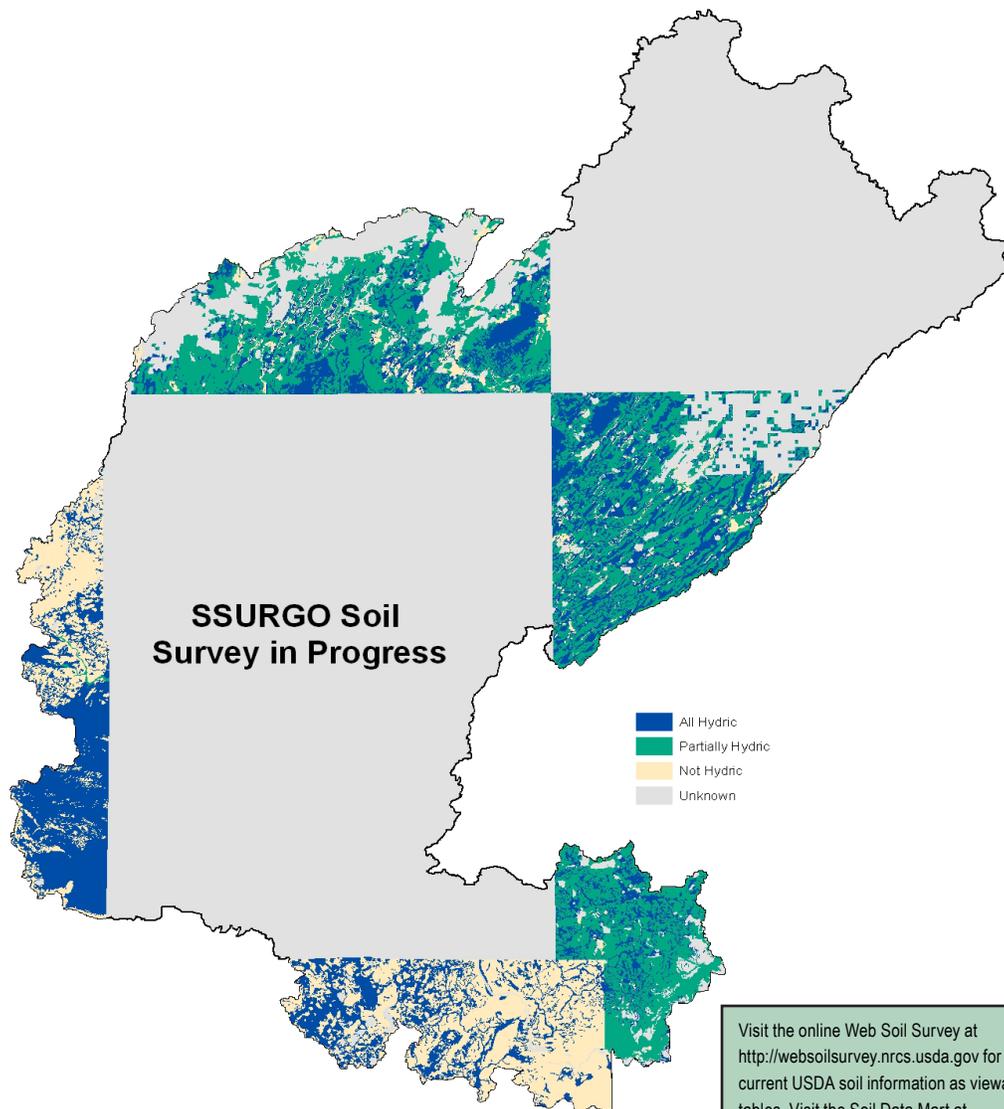
<http://soildatamart.usda.gov> to download SSURGO

 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.

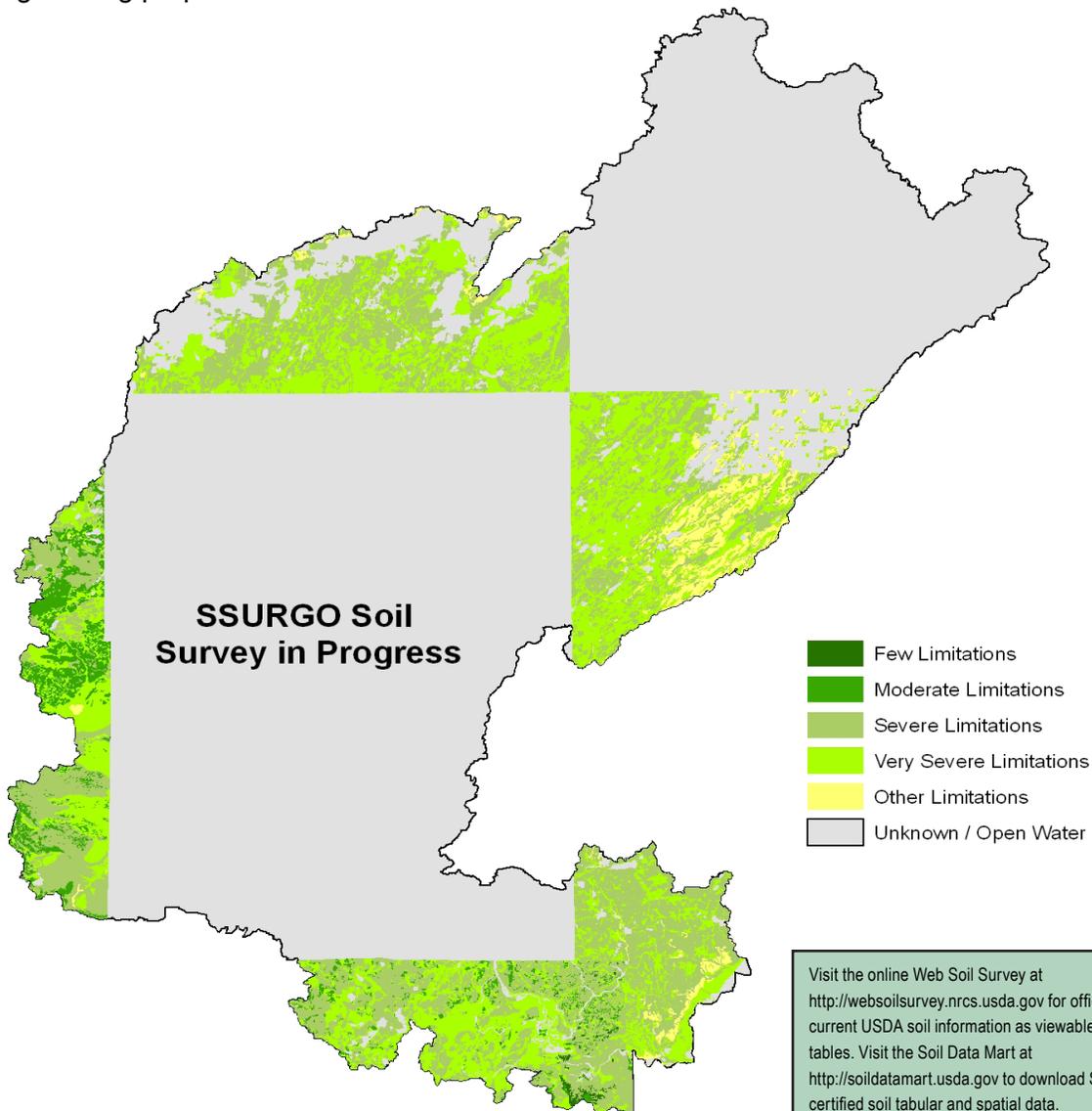


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Land Capability Classification

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.



Performance Results System Data

| Watershed Name: St. Louis | | | | Watershed Number: 04010201 | | | | | | |
|---|------|-------|-------|----------------------------|-------|------|-------|-------|-------|--------|
| PRS Performance Measures | FY99 | FY00 | FY01 | FY02 | FY03 | FY04 | FY05 | FY06 | FY07 | TOTAL |
| Total Conservation Systems Planned (acres) | 802 | 1,498 | 0 | 393 | 2,106 | N/A | 2,973 | 5,212 | 975 | 13,959 |
| Total Conservation Systems Applied (acres) | 106 | 1,514 | 0 | 1,781 | 1,781 | N/A | 1,087 | 2,232 | 1,998 | 10,499 |
| Conservation Practices | | | | | | | | | | |
| Total Waste Management (313) (numbers) | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 6 |
| Riparian Forest Buffers (391) (acres) | 1 | 0 | 10 | 150 | 20 | 0 | 0 | 0 | 0 | 181 |
| Erosion Control Total Soil Saved (tons/year) | 0 | 138 | 6,226 | 2,162 | 27 | N/A | N/A | N/A | N/A | 8,553 |
| Total Nutrient Management (590) (Acres) | 0 | 307 | 0 | 725 | 319 | 589 | 21 | 21 | 285 | 2,267 |
| Pest Management Systems Applied (595A) (Acres) | 0 | 0 | 0 | 344 | 64 | 0 | 0 | 0 | 0 | 408 |
| Prescribed Grazing 528a (acres) | 0 | 97 | 0 | 144 | 0 | 203 | 0 | 290 | 290 | 1,024 |
| Tree & Shrub Establishment (612) (acres) | 21 | 442 | 98 | 346 | 350 | 470 | 9 | 100 | 84 | 1,920 |
| Residue Management (329A-C) (acres) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Wildlife Habitat (644 - 645) (acres) | 800 | 521 | 640 | 878 | 262 | 739 | 878 | 325 | 191 | 5,234 |
| Total Wetlands Created, Restored, or Enhanced (acres) | 0 | 0 | 0 | 99 | 175 | 3 | 12 | 0 | 0 | 289 |
| Acres enrolled in Farmbill Programs | | | | | | | | | | |
| Conservation Reserve Program | 0 | 0 | 10 | 304 | 14 | N/A | 0 | 0 | 0 | 328 |
| Wetlands Reserve Program | 0 | 0 | 0 | 0 | 0 | N/A | 0 | 0 | 0 | 0 |
| Environmental Quality Incentives Program | 0 | 531 | 109 | 777 | 948 | N/A | 362 | 1,197 | 1,631 | 5,555 |
| Wildlife Habitat Incentive Program | 0 | 35 | 12 | 160 | 21 | N/A | 12 | 44 | 222 | 506 |
| Farmland Protection Program | 0 | 0 | 0 | 0 | 0 | N/A | 0 | 0 | 0 | 0 |

THREATENED AND ENDANGERED SPECIES ¹⁴

NRCS assists in the conservation of threatened and endangered species and avoids or prevents activities detrimental to such species. NRCS' concern for these species includes the species listed by the Secretary of the Interior (as published in the Federal Register) and species designated by state agencies. The following is a list of threatened, endangered, candidate species and species of special concern that occur in the basin.



| Scientific Name | Common Name | Type | Scientific Name | Common Name | Type |
|---|-------------------------------|------------|--|---------------------------|------------|
| <i>Acipenser fulvescens</i> | Lake Sturgeon | Zoological | <i>Etheostoma microperca</i> | Least Darter | Zoological |
| <i>Actinonaias ligamentina</i> | Mucket | Zoological | <i>Falco peregrinus</i> | Peregrine Falcon | Zoological |
| <i>Adoxa moschatellina</i> | Moschatel | Botanical | <i>Haliaeetus leucocephalus</i> | Bald Eagle | Zoological |
| <i>Allium schoenoprasum</i> var. <i>sibiricum</i> | Wild Chives | Botanical | <i>Hemidactylium scutatum</i> | Four-toed Salamander | Zoological |
| <i>Ammodramus nelsoni</i> | Nelson's Sharp-tailed Sparrow | Zoological | <i>Hudsonia tomentosa</i> | Beach-heather | Botanical |
| <i>Botrychium campestre</i> | Prairie Moonwort | Botanical | <i>Juncus stygius</i> var. <i>americanus</i> | Bog Rush | Botanical |
| <i>Botrychium lanceolatum</i> | Triangle Moonwort | Botanical | <i>Lasmigona compressa</i> | Creek Heelsplitter | Zoological |
| <i>Botrychium minganense</i> | Mingan Moonwort | Botanical | <i>Ligumia recta</i> | Black Sandshell | Zoological |
| <i>Botrychium mormo</i> | Goblin Fern | Botanical | <i>Littorella uniflora</i> | American Shore-plantain | Botanical |
| <i>Botrychium oneidense</i> | Blunt-lobed Grapefern | Botanical | <i>Lobaria quercizans</i> | Smooth lungwort | Botanical |
| <i>Botrychium pallidum</i> | Pale Moonwort | Botanical | <i>Myotis septentrionalis</i> | Northern Myotis | Zoological |
| <i>Botrychium rugulosum</i> | St. Lawrence Grapefern | Botanical | <i>Najas gracillima</i> | Thread-like Naiad | Botanical |
| <i>Botrychium simplex</i> | Least Moonwort | Botanical | <i>Notropis anogenus</i> | Pugnose Shiner | Zoological |
| <i>Buteo lineatus</i> | Red-shouldered Hawk | Zoological | <i>Phacelia franklinii</i> | Franklin's Phacelia | Botanical |
| <i>Calamagrostis lacustris</i> | Marsh Reedgrass | Botanical | <i>Pipistrellus subflavus</i> | Eastern Pipistrelle | Zoological |
| <i>Caltha natans</i> | Floating Marsh-marigold | Botanical | <i>Platanthera clavellata</i> | Club-spur Orchid | Botanical |
| <i>Carex exilis</i> | Coastal Sedge | Botanical | <i>Polemonium occidentale</i> ssp. <i>lacustre</i> | Western Jacob's Ladder | Botanical |
| <i>Carex flava</i> | Yellow Sedge | Botanical | <i>Potamogeton vaginatus</i> | Sheathed Pondweed | Botanical |
| <i>Carex garberi</i> | Garber's Sedge | Botanical | <i>Potamogeton vaseyi</i> | Vasey's Pondweed | Botanical |
| <i>Carex michauxiana</i> | Michaux's Sedge | Botanical | <i>Pyrola minor</i> | Small Shinleaf | Botanical |
| <i>Carex pallescens</i> | Pale Sedge | Botanical | <i>Ranunculus lapponicus</i> | Lapland Buttercup | Botanical |
| <i>Cetraria aurescens</i> | Eastern candlewas lichen | Botanical | <i>Rhynchospora fusca</i> | Sooty-colored Beak-rush | Botanical |
| <i>Cicindela hirticollis rhodensis</i> | Hairy-necked Tiger Beetle | Zoological | <i>Sparganium glomeratum</i> | Clustered Bur-reed | Botanical |
| <i>Claytonia caroliniana</i> | Carolina Spring-beauty | Botanical | <i>Sterna hirundo</i> | Common Tern | Zoological |
| <i>Clemmys insculpta</i> | Wood Turtle | Zoological | <i>Tomenthypnum falcifolium</i> | Curved-leaved golden moss | Botanical |
| <i>Coturnicops noveboracensis</i> | Yellow Rail | Zoological | <i>Torreyochloa pallida</i> | Torrey's Manna-grass | Botanical |
| <i>Drosera anglica</i> | English Sundew | Botanical | <i>Tsuga canadensis</i> | Eastern Hemlock | Botanical |
| <i>Eleocharis nitida</i> | Neat Spike-rush | Botanical | <i>Waldsteinia fragarioides</i> | Barren Strawberry | Botanical |
| <i>Emydoidea blandingii</i> | Blanding's Turtle | Zoological | <i>Xyris montana</i> | Montane Yellow-eyed Grass | Botanical |

RESOURCE CONCERNS

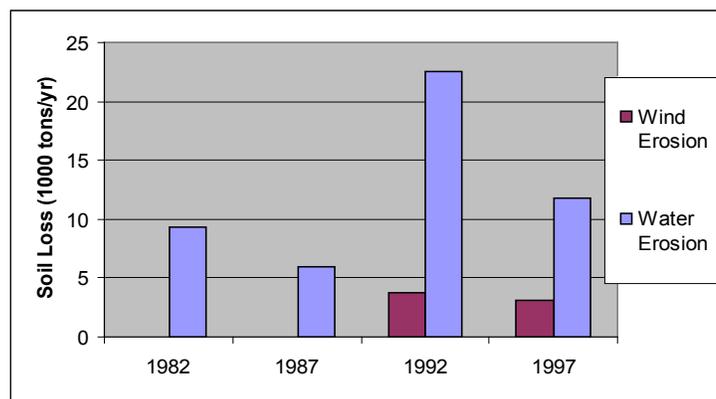
County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Soil Quality, Excessive Sheet and Rill Erosion.** Concerns are not limited to agricultural areas. Sedimentation caused by the clearing and grading of shoreland property is neither desirable nor necessary. Erosion issues relate directly to lake pollution/eutrophication and shoreland development, and compound effects of erosion from agricultural lands.
- Woodland Management.** Management opportunities include planting trees or shrubs, restoring prairies, timber stand improvement, timber sales, enhancing wildlife habitat, prescribed burning, and many other practices or projects.
- 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 quantity in 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.
- Contaminated Sediment Clean-up.** Restoration of numerous impaired uses depends on clean-up to remove contaminated sediments from the environment and restore habitat. With numerous superfund sites and remnants of years of varied industrial facilities, the St Louis River area of Concern suffers from widely distributed contaminants and persistent toxins.



NRI Erosion Estimates

- Sheet and rill erosion by water on the cropland and pastureland **increased** by approximately 2,500 tons of soil (26.88%) from 1982 to 1997.
- NRI estimates for wind erosion rates between are not available for the years 1982 and 1986. Data from 1992 and 1997 indicate a loss of 3,700 and 3,100 tons of soil respectively. ¹³



Socioeconomic and Agricultural Data (Relevant)

Estimations for the St. Louis subbasin indicate a current population of approximately 145,202 people. Median household income throughout the district is near \$37,000 yearly, roughly 79% of the national average. Unemployment is estimated at 5.2%, and approximately 10% of the residents in the watershed are below the national poverty level.



Assessment estimates indicate 550 farms located in the watershed. Approximately sixty two percent of the operations are less than 180 acres in size, thirty seven percent are from 180 to 1000 acres, and the remaining farms are greater than 1000 acres. Of the 531 Operators in the basin, fifty two percent are full-time producers not reliant on off farm income

| (MN) HUC# 4010201 | | Total Acres: | 1,872,655 |
|----------------------------------|---------------------------------|---------------------|------------------|
| Population Data* | Watershed Population | 145,202 | |
| | Unemployment Rate | 5.2% | |
| | Median Household Income | 36,969 | |
| | % below poverty level | 10% | |
| | Median Value of Home | 78,750 | |
| Farms | # of Farms | 550 | |
| | # of Operators | 531 | Percent |
| | # of Full Time Operators | 275 | 52% |
| | # of Part Time Operators | 256 | 48% |
| | Total Crop/Pasturelands: | 118,200 | 6.3% |
| Farm Size | 1 to 49 Acres | 240 | 21% |
| | 50 to 179 Acres | 481 | 41% |
| | 180 to 499 Acres | 347 | 30% |
| | 500 to 999 Acres | 77 | 7% |
| | 1,000 Acres or more | 21 | 2% |
| Livestock & Poultry | Cattle - Beef | 3,501 | 23% |
| | Cattle - Dairy | 903 | 6% |
| | Chicken | 1,927 | 13% |
| | Swine | 300 | 2% |
| | Turkey | 62 | 0% |
| | Other | 8,557 | 56% |
| | Animal Count Total: | 15,251 | |
| | Total Permitted AFOs: | 109 | |
| Chemicals (Acres Applied) | Insecticides | 2,304 | |
| | Herbicides | 17,828 | |
| | Wormicides | 0 | |
| | Fruiticides | 232 | |
| | Total Acres Treated | 20,364 | |
| | % State Chemical Totals | 0.1% | |

* 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

- **Duluth Natural Areas Program**
The Nature Conservancy, City of Duluth
- **Miller Creek Diagnostic Study and Imp. Plan,**
South St Louis County SWCD, MPCA
- **Sucker River Watershed Protection Project**
South St Louis County SWCD
- **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
- **Kingsbury Creek Erosion Project**
MN DOT, City of Duluth, S. St Louis County SWCD
- **The Lower St. Louis River Habitat Plan**
US EPA, SLRCAC, MN DNR
- **Miller Creek Habitat Restoration Project**
Great Lakes Commission
- **Watershed Guardian Program**
St. Louis River Citizens Action Committee, Cargill Inc.
- **St. Louis River System Remedial Action Plan (RAP)**
St. Louis River Citizens Action Committee
- **St. Louis River Contaminated Sediment Studies**
Minnesota Pollution Control Agency
- **Stormwater Pollution Prevention in Urban Watersheds**
South St Louis County SWCD, City of Duluth
- **Lincoln Park Miller Creek Bed Restoration Project**
City of Duluth, Area citizens and workgroups
- **Enhancement of Lake Superior's Water Quality**
North Shore Management Board

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

Conservation Districts, Organizations & Partners

- **Aitkin County SWCD**
130 Southgate Dr, Aitkin, MN 56431
Phone (218) 927-6565
- **Blandin Foundation**
100 N. Pokegama Ave Grand Rapids, MN 55744
Phone (218) 326-0523
- **Carlton County SWCD**
115 5th St S, Carlton, MN 55718-0029
Phone (218) 384-3891
- **Cromwell-Wright Monitoring Group**
Box 7 Hwy 72 & 210 Cromwell, Minnesota 55726
Phone (218) 644-3716
- **Itasca County SWCD**
1889 E Hwy 2, Grand Rapids, MN 55744
Phone (218) 326-0017
- **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
- **St Louis River Watch - FDLTCC**
2101 14th St. Cloquet, MN 55720
Phone (218) 879-0789
- **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
- **St. Louis River Citizens Action Committee**
394 Lake Ave. South #303B; Duluth, MN 55802
Phone: 218-733-9520
- **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/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/>. 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.