

Rapid Watershed Assessment

Lower St. Croix

(MN/WI) HUC: 07030005



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 Lower St. Croix 8-Digit Hydrologic Unit Code (HUC) subbasin is located in north west Wisconsin and east central Minnesota. The drainage area contributes to the river's lower 52 miles from the twin towns of Taylor Falls and St Croix Falls to the convergence of the St Croix and Mississippi rivers at Prescott Wisconsin.

Designated a wild and scenic river in 1972, the lower reaches of the St. Croix are cooperatively managed by Minnesota, Wisconsin and the National Park Service.

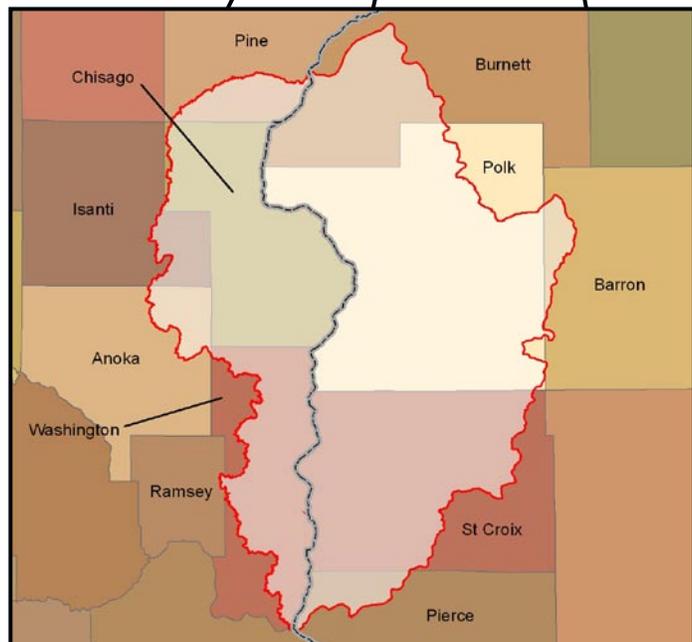
Covering 1,641,084 acres, the watershed is home to large areas of forest, grassland, and row crops. Approximately ninety percent of the land in this HUC is privately owned, and the remainder is state, federal, county, conservancy or tribal land, or held by corporate interests.

Assessment estimates indicate 4,038 farms located in the watershed. Approximately sixty eight percent of the operations are less than 180 acres in size, twenty seven percent are from 180 to 1000 acres in size, and the remaining farms are larger than 1000 acres. Average farm size in the basin is 57 acres.



County Totals

| County | Acres in HUC | % HUC |
|---------------------|---------------------|--------------|
| Pine | 50,362 | 3.1% |
| Isanti | 42,802 | 2.6% |
| Chisago | 279,300 | 17.0% |
| Anoka | 36,914 | 2.2% |
| Washington | 181,073 | 11.0% |
| Ramsey | 642 | 0.0% |
| Burnett | 160,994 | 9.8% |
| Polk | 528,789 | 32.2% |
| Barron | 23,320 | 1.4% |
| St Croix | 336,888 | 20.5% |
| Pierce | 38,010 | 2.3% |
| Total acres: | 1,641,084 | 100% |



Physical Description

The Lower St. Croix watershed encompasses portions of the North Central Hardwoods, Northern Lakes and Forests, Western Corn Belt Plains and Driftless Ecoregions. The St. Croix Stagnation Moraines and McGrath Till Plain and Drumlins subsections of the North Central Hardwood Forests ecoregion account for the largest areas of the watershed.

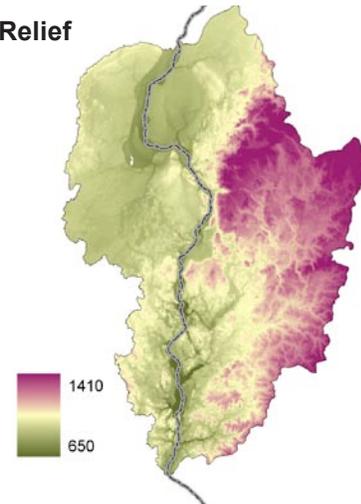
Elevation estimates range 790 to 1410 feet above sea level, with the lowest levels occurring across the eastern and central portions of the basin approaching the river channels. Average precipitation in the watershed ranges from 29 to 33 inches each year.

Predominate land uses / land covers are Forest (31%), Grass/Pasture/Hay (28%), Row Crops (22%), Residential/Commercial Development (7%), Wetlands (6.7%), and Open Water (4.5%).

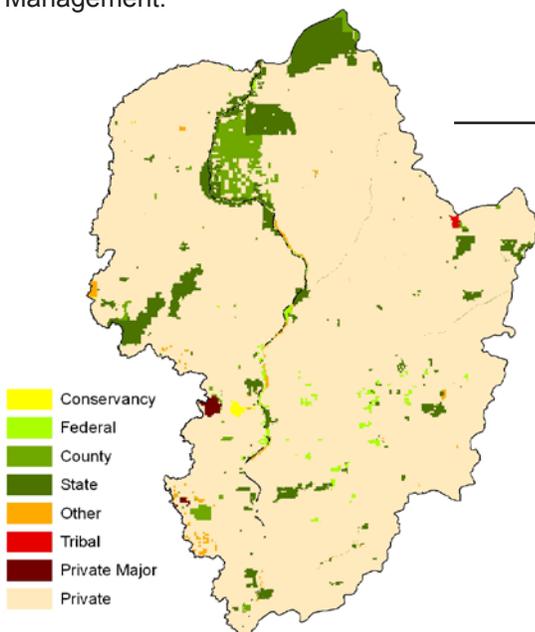
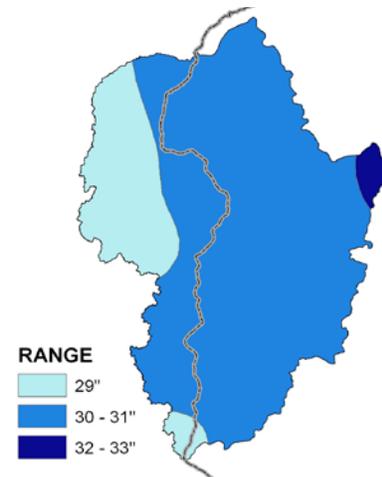
Agricultural land use within the basin accounts for approximately fifty percent of the available acres. Development pressure is increasing steadily as Minnesota's Twin Cities metropolitan area continues to sprawl to the north in Minnesota and to the west in Wisconsin.

The main resource concerns throughout the watershed are Woodland Management, Surfacewater Quality, Groundwater Quality and Quantity, Stormwater Management and Wetland Management.

Relief



Average Precipitation



Ownership¹

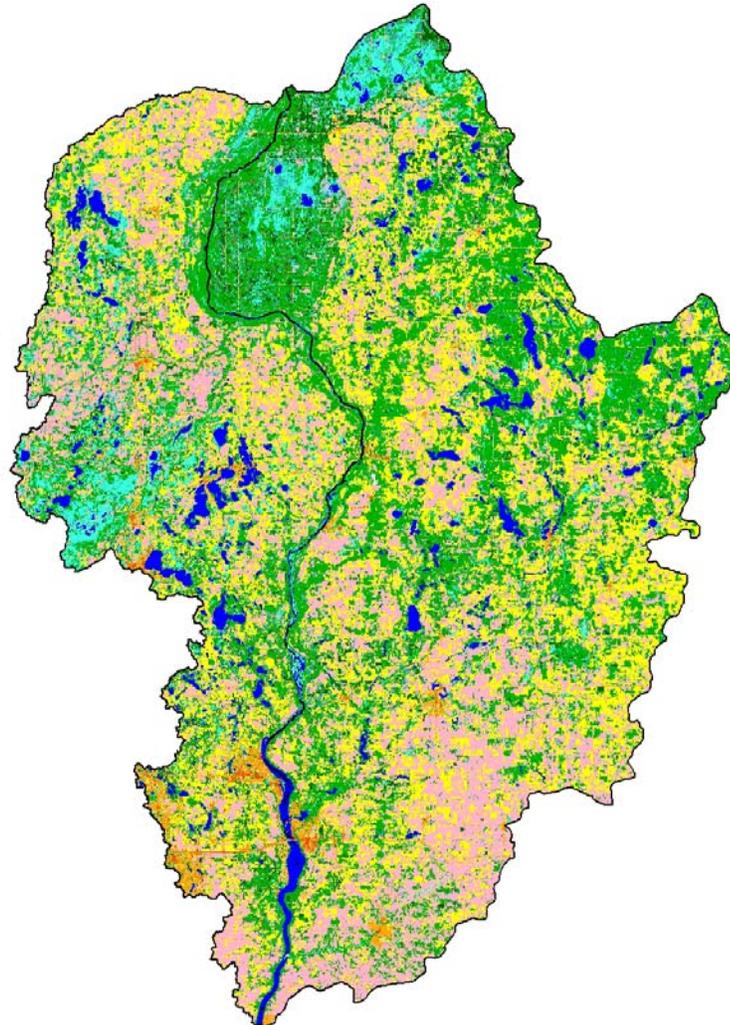
| Ownership Type | Acres | % of HUC |
|---------------------|------------------|------------|
| Conservancy | 1,749 | 0.1 |
| County | 33,036 | 2.0 |
| Federal | 11,382 | 0.7 |
| State | 106,298 | 6.3 |
| Other | 8,447 | 0.5 |
| Tribal | 929 | 0.1 |
| Private Major | 3,185 | 0.2 |
| Private | 1,513,439 | 90.2 |
| Total Acres: | 1,678,465 | 100 |

¹ Ownership totals derived from MN/WI 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 1,678,465 acres. Approximately ninety percent of the land in the watershed is Privately owned (1,513,439 acres). The second largest ownership type is State, with 106,298 acres (6.3%), followed by County with 33,036 acres (2.0%), Federal with 11,382 acres, Miscellaneous "Other Public" lands amounting to 8,447 acres (0.5%), Private Major (Corporate) land holdings of 3,185 acres (0.2%), and Conservancy lands amounting to 1,749 acres (0.1%). Tribal lands account for the smallest ownership class, covering 929 acres (0.1%). 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 | 71,629 | 4.3% | 446,882 | 26.6% | 795 | 0.0% | 519,306 | 30.9% |
| Grass, etc | 21,653 | 1.3% | 450,637 | 26.9% | 23 | 0.0% | 472,313 | 28.1% |
| Orchards | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Row Crops | 9,539 | 0.6% | 363,193 | 21.6% | 3 | 0.0% | 372,735 | 22.2% |
| Shrub etc | 2,623 | 0.2% | 7,622 | 0.5% | 1 | 0.0% | 10,246 | 0.6% |
| Wetlands | 37,991 | 2.3% | 73,622 | 4.4% | 58 | 0.0% | 111,672 | 6.7% |
| Residential/Commercial | 5,977 | 0.4% | 111,177 | 6.6% | 29 | 0.0% | 117,183 | 7.0% |
| Open Water* | 7,436 | 0.4% | 67,406 | 4.0% | 18 | 0.0% | 74,860 | 4.5% |
| Watershed Totals: | 156,848 | 9.35% | 1,520,539 | 90.6% | 928 | 0.1% | 1,678,465 | 100% |

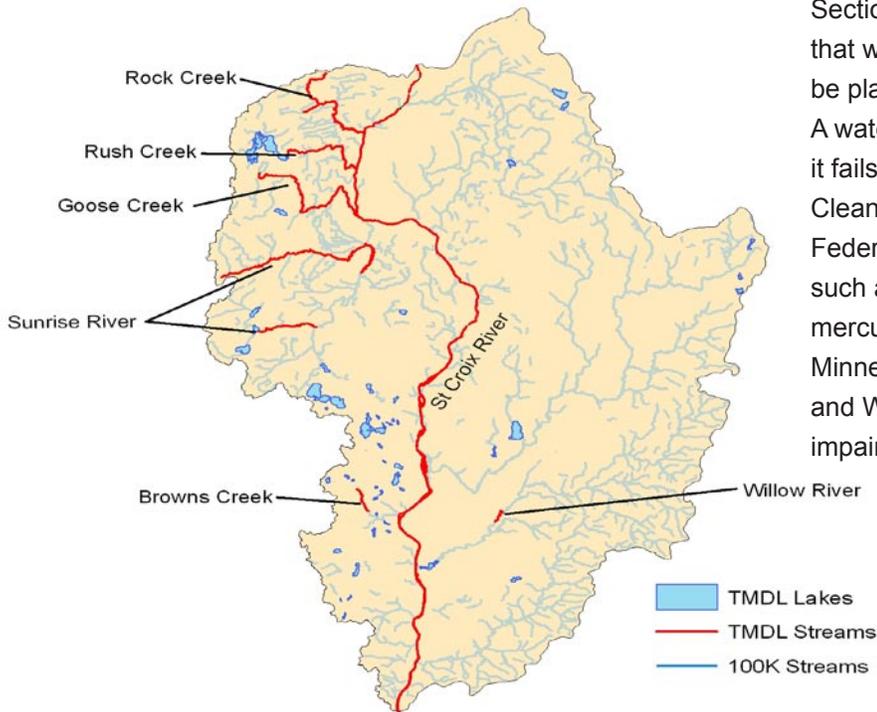
* ownership undetermined

** includes private-major

Physical Description (continued)

| | | | | cu. ft/sec | |
|---|--|-------------------------|----------------------|-----------------|--|
| Stream Flow Data | USGS 05344490 ST. CROIX RIVER AT PRESCOTT, WI | 2008 Total Avg. | | 9,305.7 | |
| | | May – Sept. Avg. | | 11,157.5 | |
| Stream Data¹⁴ (*Percent of Total HUC Stream Miles) | | | Miles | Percent | |
| | Total Miles – Major (100K Hydro GIS Layer) | | 1,867.4 | --- | |
| | 303d/TMDL Listed Streams (DEQ) | | 238.3 | 12.8% | |
| 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 | | 13,710 | 30.5% | |
| | Grain Crops | | 0 | 0.0% | |
| | Grass, etc | | 9,671 | 21.5% | |
| | Orchards | | 0 | 0.0% | |
| | Row Crops | | 7,915 | 17.6% | |
| | Shrub etc | | 204 | 0.5% | |
| | Wetlands | | 6,212 | 13.8% | |
| | Residential/Commercial | | 1,793 | 4.0% | |
| | Open Water* | | 5,446 | 12.1% | |
| | Total Buffer Acres: | | 44,951 | 100% | |
| Crop and Pastureland Land Capability Class¹⁶ (NRI Non-irrigated Land Capability Classification) | 1 – slight limitations | | 23,111 | 3% | |
| | 2 – moderate limitations | | 292,253 | 38% | |
| | 3 – severe limitations | | 150,661 | 20% | |
| | 4 – very severe limitations | | 240,765 | 31% | |
| | 5 – no erosion hazard, but other limitations | | 0 | 0% | |
| | 6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest | | 57,631 | 7% | |
| | 7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat | | 8,191 | 1% | |
| | 8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply | | 0 | 0% | |
| | NRI Croplands & Pasturelands | | 772,612 | -- | |
| | TYPE OF LAND | Acres | % of Cropland | % of HUC | |
| Irrigated Lands¹⁷ (1997 NRI Estimates for Non-Federal Lands Only) | Cultivated Cropland / Pastureland | 12,214 | 1.5% | 0.7% | |
| | Uncultivated Cropland | 0 | 0.0% | 0.0% | |
| | Total Irrigated Lands | 0 | 1.5% | 0.7% | |

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) and Wisconsin DNR to identify and restore impaired waters.

2006 303d Listed Waters

Lower St. Croix Watershed¹⁸

| Listed Stream | Impairment | Affected Use |
|--|--------------------------------------|--|
| Willow River | BOD, Degraded Habitat, Mercury, Temp | Aquatic Life, Consumption and Recreation |
| St. Croix River | Mercury, PCBs | Aquatic Life and Aquatic Consumption |
| St. Croix River; Taylors Falls Dam To Apple R (Wi) | Mercury | Aquatic Consumption |
| St. Croix River; Trade R To Taylors Falls Dam | Mercury | Aquatic Consumption |
| Sunrise River, North Branch; Headwaters To Sunrise | Fish IBI, Fecal Coliform | Aquatic Life and Aquatic Recreation |
| Rock Creek; Headwaters To St. Croix R | Fish IBI | Aquatic Life |
| Rush Creek; Headwaters (Rush Lk) To St. Croix R | Fish IBI | Aquatic Life |
| Goose Creek; Headwaters (Goose Lk) To St. Croix R | Fish IBI | Aquatic Life |
| St. Croix River; Goose Cr To Sunrise R | Mercury | Aquatic Consumption |
| Browns Creek; Headwaters To Trout Stream Portion | Fish IBI | Aquatic Life |
| Sunrise River; Kost Dam To North Br Sunrise R | Fish IBI | Aquatic Life |
| Sunrise River, West Br ; Martin Lk To Sunrise R | Fish IBI | Aquatic Life |
| Unnamed Creek; Unnamed Cr To Rock Cr | Invert IBI | Aquatic Life |
| St. Croix River; Kinnickinnic R (Wi) To Mississipp | Mercury | Aquatic Consumption |
| St. Croix River; Willow R To Kinnickinnic R (Wi) | Mercury | Aquatic Consumption |
| St. Croix River; Apple R (Wi) To Willow R | Mercury | Aquatic Consumption |
| St. Croix River; Kinnickinnic R (Wi) To Mississipp | Mercury | Aquatic Consumption |
| St. Croix River; Sunrise R To Trade R | Mercury | Aquatic Consumption |
| St. Croix River; Rush Cr To Goose Cr | Mercury | Aquatic Consumption |
| St. Croix River; Rock Cr To Rush Cr | Mercury | Aquatic Consumption |
| St. Croix River; Wood R To Rock Cr | Mercury | Aquatic Consumption |
| St. Croix River; Snake R To Wood R | Mercury | Aquatic Consumption |

2006 303d Listed Waters Lower St. Croix Watershed (Continued)¹⁸

| Listed Lake | Impairment | Affected Use |
|--------------------------|---|--|
| Twin Lakes | Contaminated Fish Tissue, DO, Excess Algal Growth | Aquatic Life, Consumption and Recreation |
| Loon Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Scott Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| North Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Echo Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Squaw Lake | Contaminated Fish Tissue, DO, Excess Algal Growth | Aquatic Life, Consumption and Recreation |
| Round Lake T37N R18W S27 | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Mud Hen Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Dunham Lake | Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Cedar Lake | Contaminated Fish Tissue, Excess Algal Growth, pH | Aquatic Life, Consumption and Recreation |
| Twin Lakes | Contaminated Fish Tissue, DO, Excess Algal Growth | Aquatic Life, Consumption and Recreation |
| Mallalieu Lake | Aquatic plants - Native, Contaminated Fish Tissue | Aquatic Life, Consumption and Recreation |
| Linwood | Excess nutrients | Aquatic Recreation |
| Martin | Excess nutrients | Aquatic Recreation |
| Little | Mercury | Aquatic Consumption |
| Comfort | Excess nutrients, Mercury | Aquatic Recreation and Aquatic Consumption |
| Fish | Mercury | Aquatic Consumption |
| Rush | Mercury | Aquatic Consumption |
| Typo | Excess nutrients | Aquatic Recreation |
| Little Carnelian | Mercury | Aquatic Consumption |
| Loon | Excess nutrients | Aquatic Recreation |
| Silver | Excess nutrients | Aquatic Recreation |
| South Twin | Excess nutrients | Aquatic Recreation |
| McKusick | Excess nutrients | Aquatic Recreation |
| Long | Excess nutrients | Aquatic Recreation |
| Lily | Excess nutrients, Mercury | Aquatic Recreation and Aquatic Consumption |
| Louise | Excess nutrients | Aquatic Recreation |
| Long | Excess nutrients | Aquatic Recreation |
| East Boot | Excess nutrients | Aquatic Recreation |
| Square | Mercury | Aquatic Consumption |
| Big Carnelian | Mercury | Aquatic Consumption |
| Big Marine | Mercury | Aquatic Consumption |
| Big Marine (Jellums) | Excess nutrients | Aquatic Recreation |
| Bone | Excess nutrients, Mercury | Aquatic Recreation and Aquatic Consumption |
| Goose | Excess nutrients | Aquatic Recreation |
| Fish | Excess nutrients | Aquatic Recreation |
| Hay | Excess nutrients | Aquatic Recreation |
| Sand | Excess nutrients | Aquatic Recreation |
| Long | Excess nutrients | Aquatic Recreation |
| Unnamed (Goggins) | Excess nutrients | Aquatic Recreation |
| Markgrafs | Excess nutrients | Aquatic Recreation |
| Wilmes | Excess nutrients | Aquatic Recreation |
| Colby | Excess nutrients | Aquatic Recreation |
| Jane | Mercury | Aquatic Consumption |
| Elmo | Mercury | Aquatic Consumption |
| South School Section | Excess nutrients | Aquatic Recreation |
| Sunset | Excess nutrients | Aquatic Recreation |
| Forest | PCBs, Mercury | Aquatic Consumption |
| Shields | Excess nutrients | Aquatic Recreation |

Common Resource Areas

Lower St. Croix encompasses four Common Resource Areas, 90A.2, 90B.1, 91B.1, and 104.1⁹

90A.2 Northwest Wisconsin Ground Moraine:

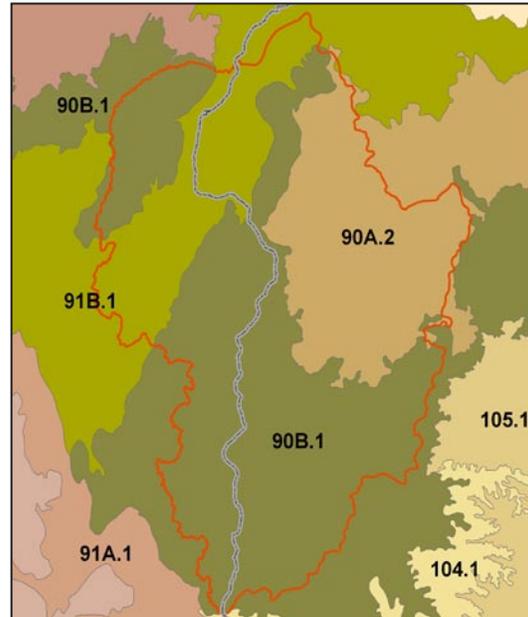
Gently and strongly sloping loamy soils underlain by dense acid loamy till. Cropland, grazing land and mixed deciduous and coniferous forest are the predominant land uses. Dairy and beef livestock production are the predominant agricultural enterprises with some cash grain. Lakes and wetlands are common. Primary resource concerns are soil erosion and nutrient management on cropland, surface and groundwater quality, shore land habitat management, and the demand for recreational properties on the lakes.

90B.1 Dense Till Ground Moraine: Nearly level and gently sloping moderately well and somewhat poorly drained loamy soils underlain by loamy glacial residuum and bedrock. Mostly cropland and grazing land, with areas of mixed deciduous and coniferous forest, wetlands, and a few lakes. Dairy and beef production with some cash grain are the primary agricultural enterprises. Primary resource concerns include nutrient management, cropland soil erosion, grazing land productivity, and forestry management.

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91B.1 Northwest Wisconsin Outwash: Gently sloping to moderately steep outwash plains and moraines. Soils range from excessively drained sandy soils to very poorly drained organic soils. Mostly deciduous and coniferous forestland, pasture with more cropland in the western part. The primary resource concerns are forestland productivity, erosion control on cropland and timbered areas during harvest, upland wildlife habitat management, and recreation.

104.1 Silty and Loamy Mantled Firm Till Plain: Gently sloping to very steep dissected till plain. Soils are predominantly well drained and are formed in thin silty material over loamy till, underlain by sedimentary bedrock. Cropland and grazing land on ridge tops and valley bottoms with a mix of dairy, beef and cash grain agricultural enterprises. Deciduous forest on side slopes. Primary resource concerns are cropland erosion, surface water quality, grazing land and woodland productivity, and soil erosion during timber harvest.



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

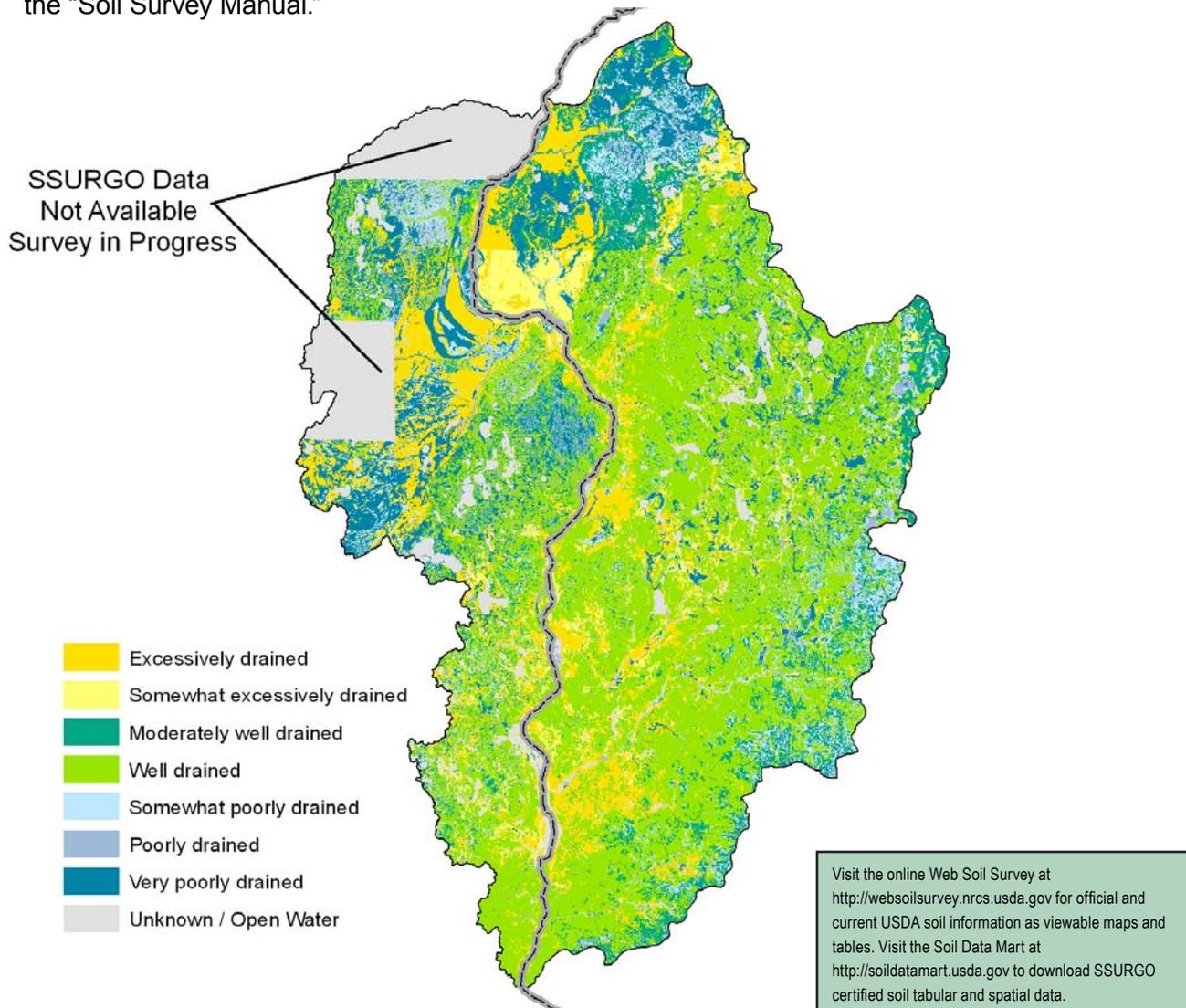
<http://soildatamart.usda.gov> to download SSURGO

 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.”



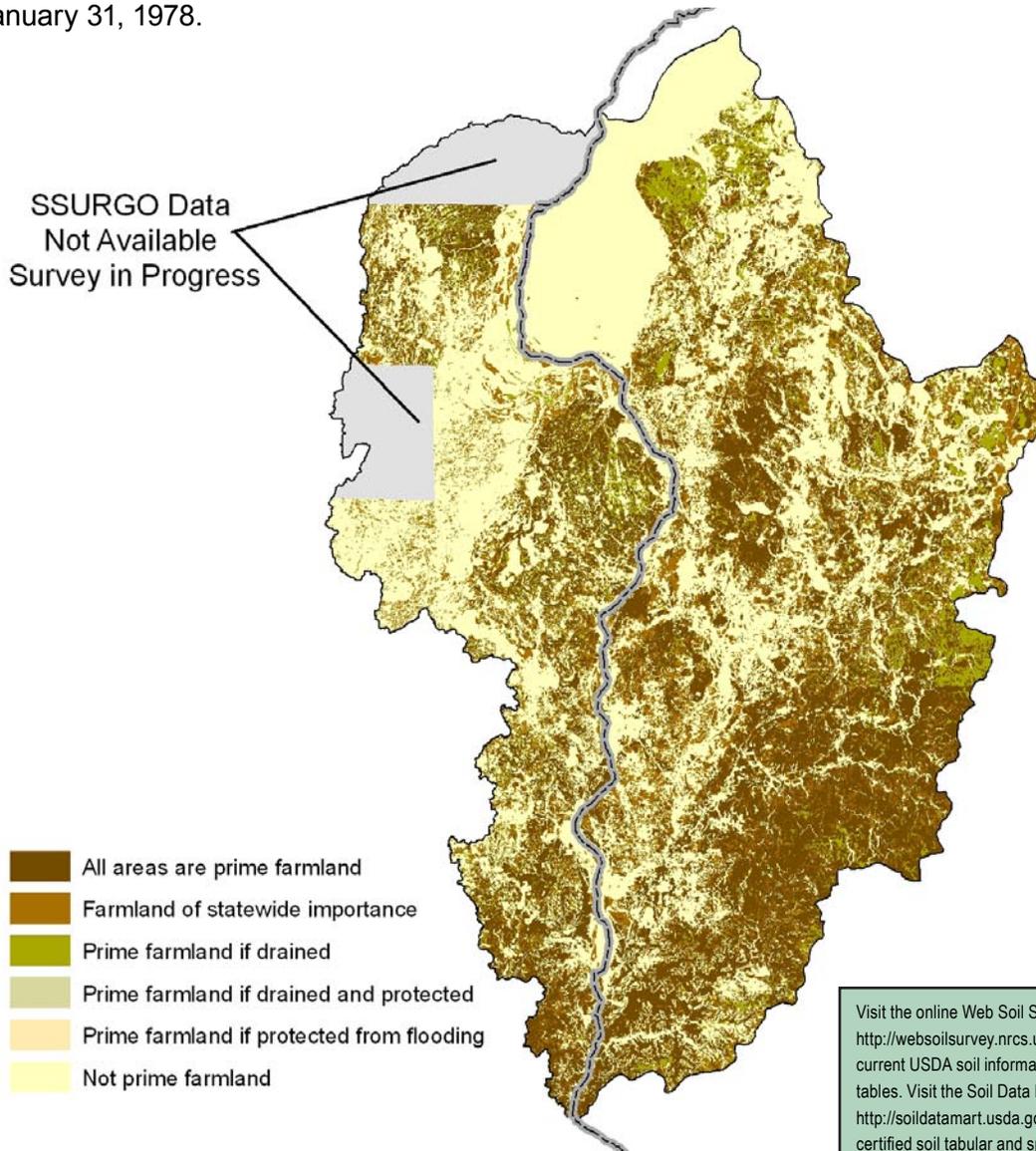
Note: Historical Drainage Class Determination Standards, scale, and methodology can vary on a county-to-county basis, leading to irregularities in thematic maps representing drainage classification determinations.

Farmland Classification

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

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

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



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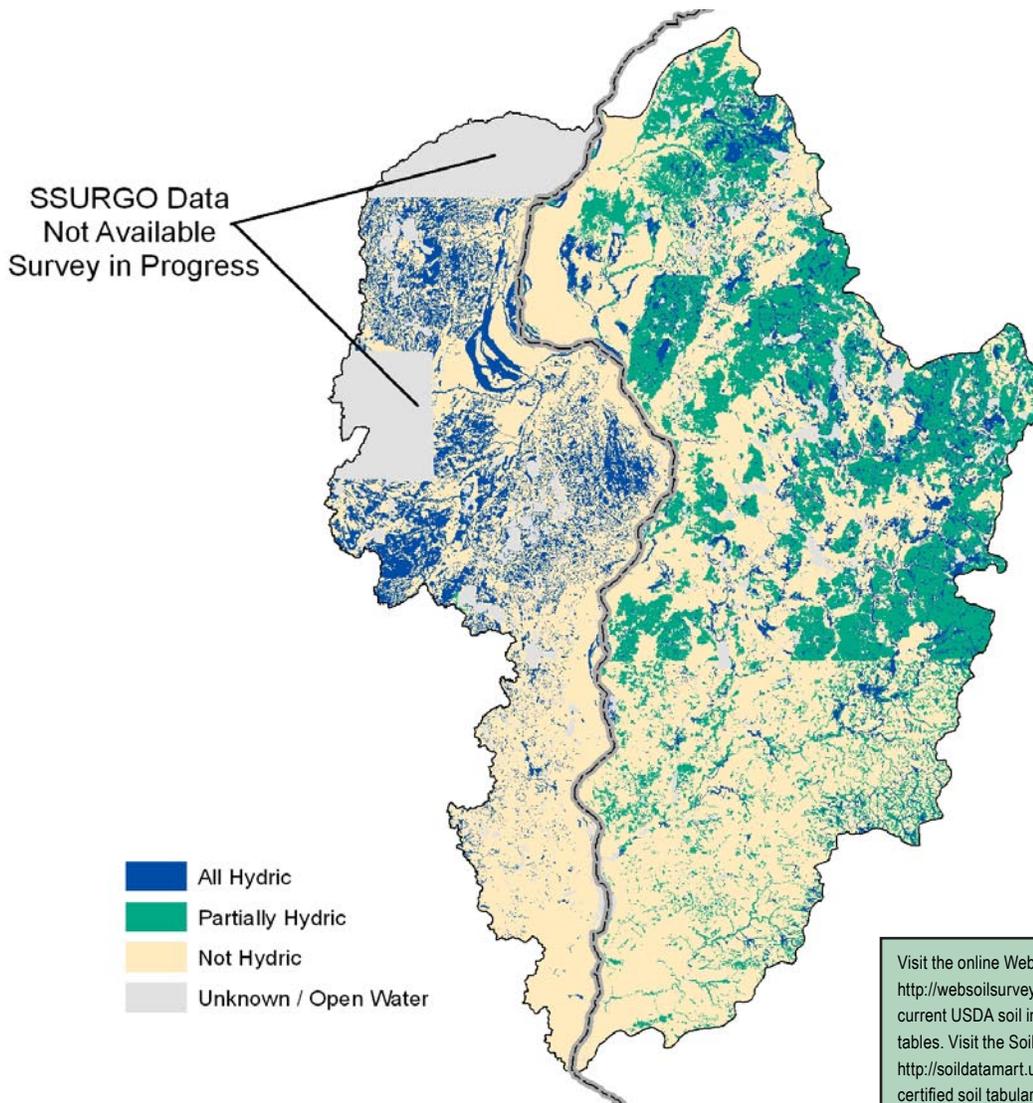
<http://soildatamart.usda.gov> to download SSURGO

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Hydric Soils

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

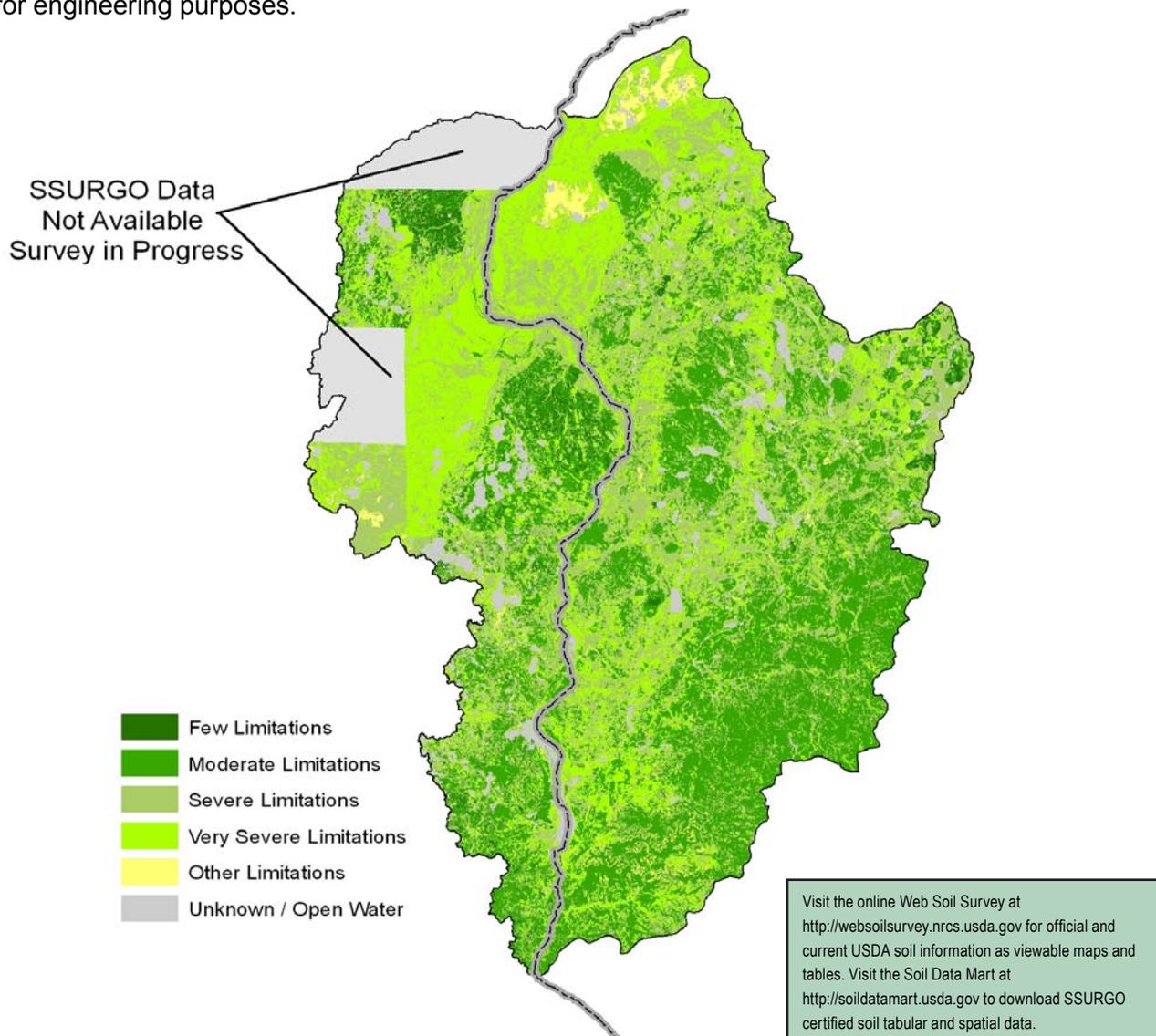


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Land Capability Classification

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.



Note: Historical Hydric Soil Determination Standards, scale, and methodology can vary on a county-to-county basis, leading to irregularities in thematic maps representing land capability classification.

Performance Results System Data

| Watershed Name: Lower St. Croix | | | | Watershed Number: 07030005 | | | | | | |
|---|-------|--------|--------|----------------------------|--------|-------|--------|--------|--------|----------------|
| PRS Performance Measures | FY99 | FY00 | FY01 | FY02 | FY03 | FY04 | FY05 | FY06 | FY07 | MN & WI TOTALS |
| Total Conservation Systems Planned (acres) | 6,564 | 21,581 | 16,183 | 19,669 | 21,015 | N/A | 27,861 | 15,145 | 15,760 | 143,778 |
| Total Conservation Systems Applied (acres) | 6,278 | 12,096 | 8,333 | 18,408 | 13,219 | N/A | 18,091 | 14,301 | 17,446 | 108,172 |
| Conservation Practices | | | | | | | | | | |
| Total Waste Management (313) (numbers) | 1 | 6 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 11 |
| Riparian Forest Buffers (391) (acres) | 0 | 1 | 0 | 94 | 121 | 0 | 0 | 18 | 39 | 273 |
| Erosion Control Total Soil Saved (tons/year) | 5,018 | 41,052 | 20,875 | 32,530 | 38,304 | N/A | N/A | N/A | N/A | 137,779 |
| Total Nutrient Management (590) (Acres) | 1,382 | 6,439 | 6,599 | 7,610 | 1,724 | 1,775 | 3,203 | 4,695 | 3,699 | 37,126 |
| Pest Management Systems Applied (595A) (Acres) | 0 | 0 | 3,182 | 2,636 | 491 | 248 | 2,131 | 1,571 | 1,318 | 11,577 |
| Prescribed Grazing 528a (acres) | 80 | 168 | 178 | 353 | 334 | 837 | 679 | 168 | 127 | 2,924 |
| Tree & Shrub Establishment (612) (acres) | 565 | 621 | 537 | 551 | 540 | 539 | 167 | 102 | 115 | 3,737 |
| Residue Management (329A-C) (acres) | 880 | 2,640 | 3,554 | 1,274 | 3,855 | 3,164 | 5,128 | 6,953 | 3,625 | 31,073 |
| Total Wildlife Habitat (644 - 645) (acres) | 218 | 2,678 | 6,941 | 10,398 | 4,821 | 2,335 | 1,758 | 3,262 | 5,231 | 37,642 |
| Total Wetlands Created, Restored, or Enhanced (acres) | 12 | 181 | 290 | 160 | 146 | 149 | 9 | 27 | 54 | 1,028 |
| Acres enrolled in Farmbill Programs | | | | | | | | | | |
| Conservation Reserve Program | 4,364 | 5,606 | 3,989 | 8,735 | 2,580 | N/A | 868 | 425 | 785 | 27,352 |
| Wetlands Reserve Program | 0 | 389 | 0 | 96 | 52 | N/A | 0 | 14 | 0 | 551 |
| Environmental Quality Incentives Program | 0 | 2,131 | 571 | 5,667 | 1,465 | N/A | 12,062 | 11,333 | 11,932 | 45,161 |
| Wildlife Habitat Incentive Program | 1,195 | 18 | 6 | 20 | 46 | N/A | 37 | 161 | 60 | 1,543 |
| Farmland Protection Program | 0 | 0 | 0 | 0 | 0 | N/A | 0 | 0 | 0 | 0 |

RESOURCE CONCERNS

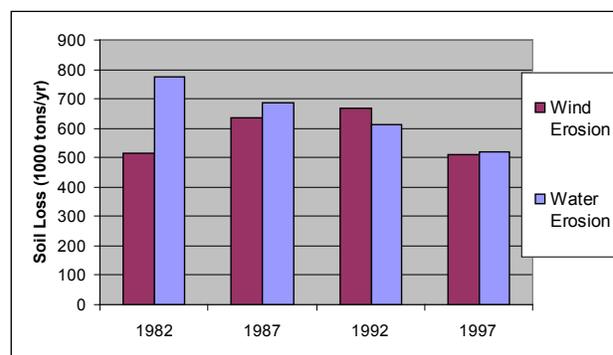
County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Woodland Management.** Districts seek to manage timber harvest and forestry practices to maintain minimal open space in riparian and priority areas. Management opportunities include planting trees or shrubs, timber stand improvement, timber sales, conversion to coniferous forests, enhancing wildlife habitat, and more.
- Surface Water Quality, Nutrients, Sediment & Priority Pollutants.** Excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing a fish community with depressed populations and limited diversity. Sediment, Mercury and other heavy metal levels are affecting the health of Aquatic communities, and affecting the consumption of fish in many areas of concern.
- Ground Water Quality.** Nutrients, Organics, Animal and Human Wastewater management. Aging septic systems, feedlot runoff, nutrient runoff, tilling practices, improper closure of old manure pits, and abandoned wells all pose threats to groundwater quality throughout the region. Improved management of wastewater ensures safe water for all uses.
- Ground Water Quantity.** Land alterations have transformed the flow, retention, and replenishment of the hydrologic cycle. Pattern tiling, ditching, wetland removal, development, stormwater drainage, excessive groundwater use, etc. have resulted in the cumulative effect of rapidly transporting a greater amount of water to major rivers and streams, and away from groundwater recharge potential.
- 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 measures.
- Wetland Management.** Area groups recognize that development, agricultural practices, and forestry 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 estimates indicate sheet and rill erosion in the basin declined 33% between 1982 and 1997, a reduction of 256,300 tons.
- Despite periodic fluctuations, estimates for wind erosion indicate a reduction of 6,100 tons between 1982 and 1997 (1.2%). ¹³



THREATENED AND ENDANGERED SPECIES OF THE BASIN ¹⁴

NRCS assists in the conservation of threatened and endangered species and avoids or prevents activities detrimental to such species. The following is a list of threatened, endangered, candidate species and species of special concern that occur in the Minnesota portion of the basin.

| Scientific Name | Common Name | Type | Scientific Name | Common Name | Type |
|------------------------------------|-------------------------------|------------|---|----------------------------------|------------|
| <i>Acipenser fulvescens</i> | Lake Sturgeon | Zoological | <i>Lampsilis higginsii</i> | Higgins Eye | Zoological |
| <i>Acris crepitans</i> | Northern Cricket Frog | Zoological | <i>Lasmigona compressa</i> | Creek Heelsplitter | Zoological |
| <i>Actinonaias ligamentina</i> | Mucket | Zoological | <i>Lasmigona costata</i> | Fluted-shell | Zoological |
| <i>Aflexia rubranura</i> | Red Tailed Prairie Leafhopper | Zoological | <i>Lechea tenuifolia</i> | Narrow-leaved Pinweed | Botanical |
| <i>Alasmidonta marginata</i> | Elktoe | Zoological | <i>Ligumia recta</i> | Black Sandshell | Zoological |
| <i>Alosa chrysochloris</i> | Skipjack Herring | Zoological | <i>Lycaeides melissa samuelis</i> | Karner Blue | Zoological |
| <i>Ammocrypta asprella</i> | Crystal Darter | Zoological | <i>Lysimachia quadrifolia</i> | Whorled Loosestrife | Botanical |
| <i>Ammodramus henslowii</i> | Henslow's Sparrow | Zoological | <i>Marpissa grata</i> | A Jumping Spider | Zoological |
| <i>Antennaria parvifolia</i> | Small-leaved Pussytoes | Botanical | <i>Megaloniais nervosa</i> | Washboard | Zoological |
| <i>Apalone mutica</i> | Smooth Softshell | Zoological | <i>Metaphidippus arizonensis</i> | A Jumping Spider | Zoological |
| <i>Arcidens confragosus</i> | Rock Pocketbook | Zoological | <i>Minuartia dawsonensis</i> | Rock Sandwort | Botanical |
| <i>Aristida tuberculosa</i> | Sea-beach Needlegrass | Botanical | <i>Myotis septentrionalis</i> | Northern Myotis | Zoological |
| <i>Asynarchus rossi</i> | A Caddisfly | Zoological | <i>Notropis amnis</i> | Pallid Shiner | Zoological |
| <i>Aureolaria pedicularia</i> | Fernleaf False Foxglove | Botanical | <i>Notropis anogenus</i> | Pugnose Shiner | Zoological |
| <i>Baptisia alba</i> | White Wild Indigo | Botanical | <i>Obovaria olivaria</i> | Hickorynut | Zoological |
| <i>Besseyia bullii</i> | Kitten-tails | Botanical | <i>Oenothera rhombipetala</i> | Rhombic-petaled Evening Primrose | Botanical |
| <i>Botrychium oneidense</i> | Blunt-lobed Grapefern | Botanical | <i>Ophiogomphus susbehcha</i> | St. Croix Snaketail | Zoological |
| <i>Botrychium rugulosum</i> | St. Lawrence Grapefern | Botanical | <i>Opuntia macrorhiza</i> | Plains Prickly Pear | Botanical |
| <i>Buteo lineatus</i> | Red-shouldered Hawk | Zoological | <i>Panax quinquefolius</i> | American Ginseng | Botanical |
| <i>Carex typhina</i> | Cattail Sedge | Botanical | <i>Paradamoetas fontana</i> | A Jumping Spider | Zoological |
| <i>Cicindela patruela patruela</i> | Northern Barrens Tiger Beetle | Zoological | <i>Parmelia stuppea</i> | Powder-edged ruffle lichen | Botanical |
| <i>Cirsium hillii</i> | Hill's Thistle | Botanical | <i>Paronychia fastigiata</i> | Forked Chickweed | Botanical |
| <i>Clemmys insculpta</i> | Wood Turtle | Zoological | <i>Percina evides</i> | Gilt Darter | Zoological |
| <i>Coccocarpia palmicola</i> | Salted shell lichen | Botanical | <i>Phalaropus tricolor</i> | Wilson's Phalarope | Zoological |
| <i>Coluber constrictor</i> | Eastern Racer | Zoological | <i>Pipistrellus subflavus</i> | Eastern Pipistrelle | Zoological |
| <i>Coturnicops noveboracensis</i> | Yellow Rail | Zoological | <i>Pituophis catenifer</i> | Gopher Snake | Zoological |
| <i>Cristatella jamesii</i> | James' Polanisia | Botanical | <i>Platanthera clavellata</i> | Club-spur Orchid | Botanical |
| <i>Cumberlandia monodonta</i> | Spectaclecase | Zoological | <i>Platanthera flava</i> var. <i>herbiola</i> | Tuberclad Rein-orchid | Botanical |
| <i>Cycleptus elongatus</i> | Blue Sucker | Zoological | <i>Pleurobema coccineum</i> | Round Pigtoe | Zoological |
| <i>Cyclonaias tuberculata</i> | Purple Wartyback | Zoological | <i>Poa paludigena</i> | Bog Bluegrass | Botanical |
| <i>Decodon verticillatus</i> | Waterwillow | Botanical | <i>Polygala cruciata</i> | Cross-leaved Milkwort | Botanical |
| <i>Dendroica cerulea</i> | Cerulean Warbler | Zoological | <i>Polyodon spathula</i> | Paddlefish | Zoological |
| <i>Desmodium nudiflorum</i> | Stemless Tick-trefoil | Botanical | <i>Psathyrella cystidioides</i> | A Species of Fungus | Botanical |
| <i>Dryopteris goldiana</i> | Goldie's Fern | Botanical | <i>Quadrula fragosa</i> | Winged Mapleleaf | Zoological |
| <i>Ellipsaria lineolata</i> | Butterfly | Zoological | <i>Quadrula metanevra</i> | Monkeyface | Zoological |
| <i>Elliptio crassidens</i> | Elephant-ear | Zoological | <i>Quadrula nodulata</i> | Wartyback | Zoological |
| <i>Elliptio dilatata</i> | Spike | Zoological | <i>Rotala ramosior</i> | Tooth-cup | Botanical |
| <i>Empidonax virescens</i> | Acadian Flycatcher | Zoological | <i>Scirpus clintonii</i> | Clinton's Bulrush | Botanical |
| <i>Emydoidea blandingii</i> | Blanding's Turtle | Zoological | <i>Scleria triglomerata</i> | Tall Nut-rush | Botanical |
| <i>Eumeces fasciatus</i> | Five-lined Skink | Zoological | <i>Seiurus motacilla</i> | Louisiana Waterthrush | Zoological |
| <i>Falco peregrinus</i> | Peregrine Falcon | Zoological | <i>Simpsonia ambigua</i> | Salamander Mussel | Zoological |
| <i>Fimbristylis autumnalis</i> | Autumn Fimbristylis | Botanical | <i>Speyeria idalia</i> | Regal Fritillary | Zoological |
| <i>Floerkea proserpinacoides</i> | False Mermaid | Botanical | <i>Spilogale putorius</i> | Eastern Spotted Skunk | Zoological |
| <i>Fusconaia ebena</i> | Ebonyshell | Zoological | <i>Sterna forsteri</i> | Forster's Tern | Zoological |
| <i>Gallinula chloropus</i> | Common Moorhen | Zoological | <i>Talinum rugospermum</i> | Rough-seeded Fameflower | Botanical |
| <i>Haliaeetus leucocephalus</i> | Bald Eagle | Zoological | <i>Tritogonia verrucosa</i> | Pistolgrip | Zoological |
| <i>Heterodon nasicus</i> | Western Hognose Snake | Zoological | <i>Tutelina formicaria</i> | A Jumping Spider | Zoological |
| <i>Hudsonia tomentosa</i> | Beach-heather | Botanical | <i>Viola lanceolata</i> | Lance-leaved Violet | Botanical |
| <i>Hydrocotyle americana</i> | American Water-pennywort | Botanical | <i>Wilsonia citrina</i> | Hooded Warbler | Zoological |
| <i>Ichthyomyzon gagei</i> | Southern Brook Lamprey | Zoological | <i>Xyris torta</i> | Twisted Yellow-eyed Grass | Botanical |
| <i>Juniperus horizontalis</i> | Creeping Juniper | Botanical | | | |

Socioeconomic and Agricultural Data (Relevant)

Estimations for the Lower St. Croix subbasin indicate a current population of approximately 273,190 people. Median household income throughout the area is \$55,975 yearly, roughly 120% of the national average. Unemployment is estimated at 4.8%, and approximately 7% of the residents in the watershed live below the national poverty level.



Assessment estimates indicate 4,038 farms located in the watershed. Approximately sixty eight percent of the operations are less than 180 acres in size, twenty seven percent are from 180 to 1000 acres in size, and the remaining farms are larger than 1000 acres. Average farm size in the basin is 57 acres. Of the 3,918 operators in the basin, fifty two percent are full-time producers not reliant on off-farm income.

| (MN) HUC# 7030005 | | Total Acres: | 1,678,465 |
|----------------------------------|-----------------------------------|---------------------|------------------|
| Population Data* | Watershed Population | 273,190 | |
| | Unemployment Rate | 4.8% | |
| | Median Household Income | 55,975 | |
| | % below poverty level | 7% | |
| | Median Value of Home | 113,655 | |
| Farm Data | # of Farms | 4,038 | |
| | # of Operators | 3,918 | Percent |
| | # of Full Time Operators | 2,030 | 52% |
| | # of Part Time Operators | 1,888 | 48% |
| | Total Cropland Acres | 772,612 | 46.0% |
| Farm Size | 1 to 49 Acres | 201 | 32% |
| | 50 to 179 Acres | 228 | 36% |
| | 180 to 499 Acres | 131 | 21% |
| | 500 to 999 Acres | 39 | 6% |
| | 1,000 Acres or more | 31 | 5% |
| | Average Farm Size | 69 | |
| Livestock & Poultry | Cattle - Beef | 14,368 | 6% |
| | Cattle - Dairy | 23,177 | 9% |
| | Chicken | 12,748 | 5% |
| | Swine | 16,315 | 6% |
| | Turkey | 57,512 | 22% |
| | Other | 136,113 | 52% |
| | Animal Count Total: | 260,232 | |
| | Total Permitted AFOs (MN): | 230 | |
| Chemicals (Acres Applied) | Insecticides | 80,371 | |
| | Herbicides | 343,866 | |
| | Wormicides | 11,378 | |
| | Fruiticides | 10,464 | |
| | Total Acres Treated (MN): | 446,080 | |

* 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

- **Water Quality Monitoring**
Friends of the St. Croix Headwaters
- **Phosphorus Index Study: St Croix Basin**
University of Minnesota, US Geological Survey
- **Historic Land Use Reconstruction Project**
Minnesota Pollution Control Agency, SLRCAC
- **Sediment Research and Monitoring**
US Geological Survey, St Mary's University
- **Upper Mississippi Water Level Management**
US Army Corps of Engineers
- **Conservation Action Planning (CAP)**
The Nature Conservancy
- **Historic Resource Study**
National Park Service
- **St. Croix Living History Project**
Friends of the St. Croix Headwaters
- **Mussels of the St. Croix River Study**
US Fish and Wildlife Service
- **Action Plan for the Lower St. Croix River**
US Fish and Wildlife Service
- **Lower St. Croix Watershed Management Plan**
Lower St. Croix Watershed Management Organization
- **Upper St Croix Watershed Alliance**
Friends of the St. Croix Headwaters
- **St. Croix Basin Water Resources Team**
MN Pollution Control Agency
- **St. Croix River Conservation Collaborative**
University of Wisconsin, MN & WI Partners

* 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

- **Anoka SWCD**
16015 Central Ave NE #103, Ham Lake, MN 55304
Phone (763) 434-2030
- **Barron County SWCD**
330 East LaSalle Ave #221 Barron, WI 54812
Phone (715) 537-6315
- **Burnett Land & Water Conservation Department**
7410 County Rd K, #109 Siren, WI 54872
Phone (715) 349-2186
- **Chisago SWCD**
38814 Third Ave, North Branch, MN 55056
Phone (651) 674-2333
- **Isanti SWCD**
380 Garfield St S, Cambridge, MN 55008
Phone (763) 689-3224
- **Lower St. Croix Watershed Management Org.**
651 Hale Avenue North Oakdale, MN 55128
Phone (651)770-8448
- **Minnesota USDA/NRCS**
375 Jackson Street #600 Saint Paul, MN 55101
Phone (651) 602-7900
- **Pierce County Land Conservation Department**
412 W Kinne St, PO Box 67, Ellsworth, WI 54011
Phone (715) 273-6763
- **Pine SWCD**
260 Morris Ave N, Hinkley, MN 55037
Phone (320) 384-7431
- **Polk Land & Water Conservation Department**
100 Polk County Plaza, #120 Balsam Lake, WI 54810
Phone (715) 485-8699
- **Ramsey Conservation District**
1425 Paul Kirkwold Dr, Arden Hills, MN 55112
Phone (651) 266-7270
- **St. Croix County Land & Water Conservation Dep.**
1960 8th Ave, Suite 141, Baldwin, WI 54002
Phone (715) 684-2874
- **Washington Conservation District**
1380 W Frontage Rd Hwy 36, Stillwater, MN 55082
Phone (651) 275-1136
- **Wisconsin USDA/NRCS**
8030 Excelsior Drive Madison, WI 53717
Phone (608) 662-4422

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. 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. USGS Gap Analysis Program - Wisconsin Stewardship Data: U.S. Geological Survey; Upper Midwest Environmental Sciences Center Publication Date: 9/1/2005
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. SSURGO - Nonirrigated Capability Class - Land Classification: This data is a derived product from the digital soil survey and generally is the most detailed level of soil geographic data developed by the National Cooperative Soil Survey. All the county layers were dissolved with single-part option using the attribute field, then merged into one layer using ArcMap 9.1 by MN NRCS RWA Staff to create this final product at the HUC8 Level. Land capability Classification was then extracted to areas classified as Crop and Pasture Land in the processed 2001 NLCD data.
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 county in the HUC or by percent of block group area in the HUC, depending on the level of data available. Data were also taken from 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.