

## Rapid Watershed Assessment

### Baptism-Brule

(MN) HUC: 04010101



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 Baptism Brule 8-Digit Hydrologic Unit Code (HUC) subbasin is located in the Northern Lakes and Forest ecoregion of Minnesota. This largely forested watershed is 1,019,923 acres in size. Approximately fourteen percent of the land in this HUC is privately owned, and the remainder is tribal, state, county, conservancy or federally owned land.

Assessment estimates indicate 22 farms located in the watershed. Approximately eighty two percent of the operations are less than 180 acres in size, eighteen percent are from 180 to 1000 acres in size, and no farms in this HUC appear to be greater than 1000 acres. Of the 20 operators in the watershed, 47 percent are full-time producers not reliant on off-farm income.

The main resource concerns throughout the watershed are sheet and rill, streambank, lakeshore and roadside erosion, groundwater quality and quantity, surfacewater quality and quantity, timberland management, shoreline management, and wetland management.

Associated with the erosion runoff and stormwater issues are increased sediment and pollutant loadings to surface waters.



### County Totals

<b>County</b>	<b>Acres in HUC</b>	<b>% HUC</b>
Cook	822,957	80.7%
Lake	196,965	19.3%
<b>Total acres:</b>	<b>1,019,923</b>	<b>100%</b>

## Physical Description

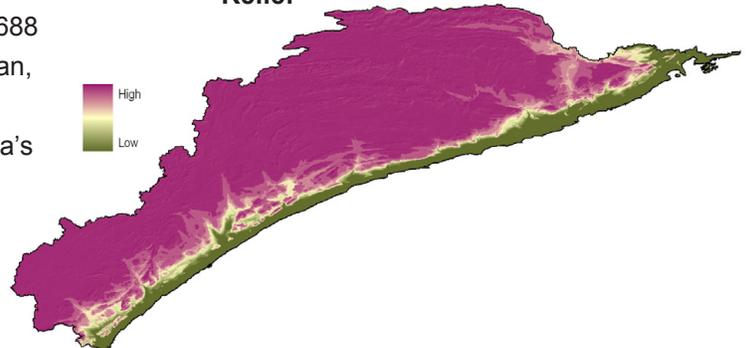
Elevation in the Baptism-Brule subbasin generally ranges from 1798 feet above mean sea level (msl) to as low as 688 feet above msl. This watershed is home to Eagle Mountain, the highest point in Minnesota at 2,301 feet above msl. Interestingly, this highest point is 15 miles from Minnesota's Lowest elevation, Lake Superior, at 607 ft above msl.

Precipitation in the watershed ranges from 27 to 33 inches annually. Evaporation estimates are between 28 to 32 inches annually (Minnesota State Climatologists Office, 1999).

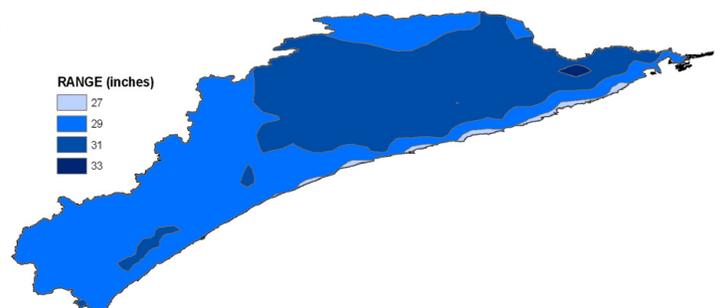
Much of the land within this HUC is not considered highly erodible, and is poorly suited to agricultural uses. Predominate land uses / land covers are Forest (85.9%), Open Water (6.5%), Shrub/Scrubland (3.4%), and Wetlands (3.0%)

Land use within the watershed is scarcely agricultural, accounting for less than one percent of the available acres. Development pressure is moderate, with some timberland, resorts and lakeshore being parceled out for recreation, lake or country homes.

**Relief**

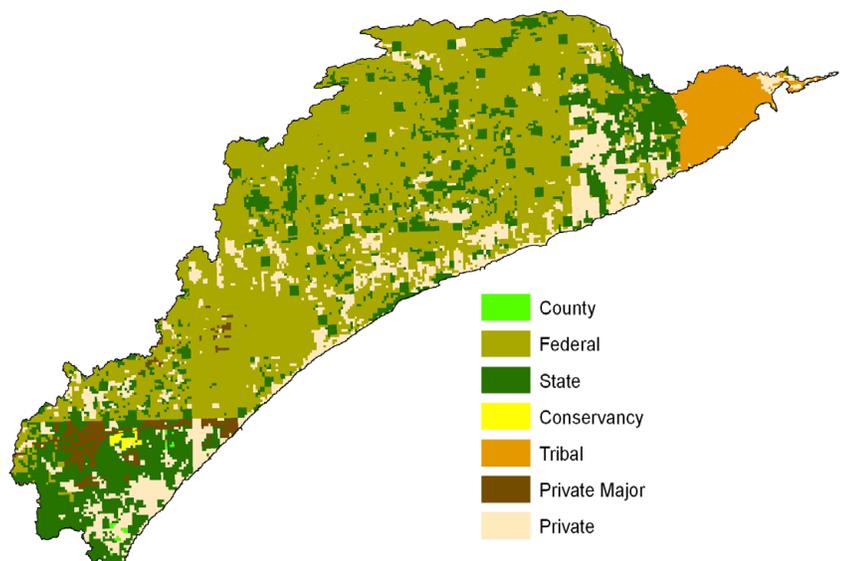


**Average Precipitation**



## Ownership

Ownership Type	Acres	% of HUC
Conservancy	2,316	0.2
County	954	0.1
Federal	582,694	57.1
State	221,977	21.8
Other	-	-
Tribal	43,499	4.3
Private Major	21,504	2.1
Private	146,979	14.4
<b>Total Acres:</b>	<b>1,019,923</b>	<b>100</b>



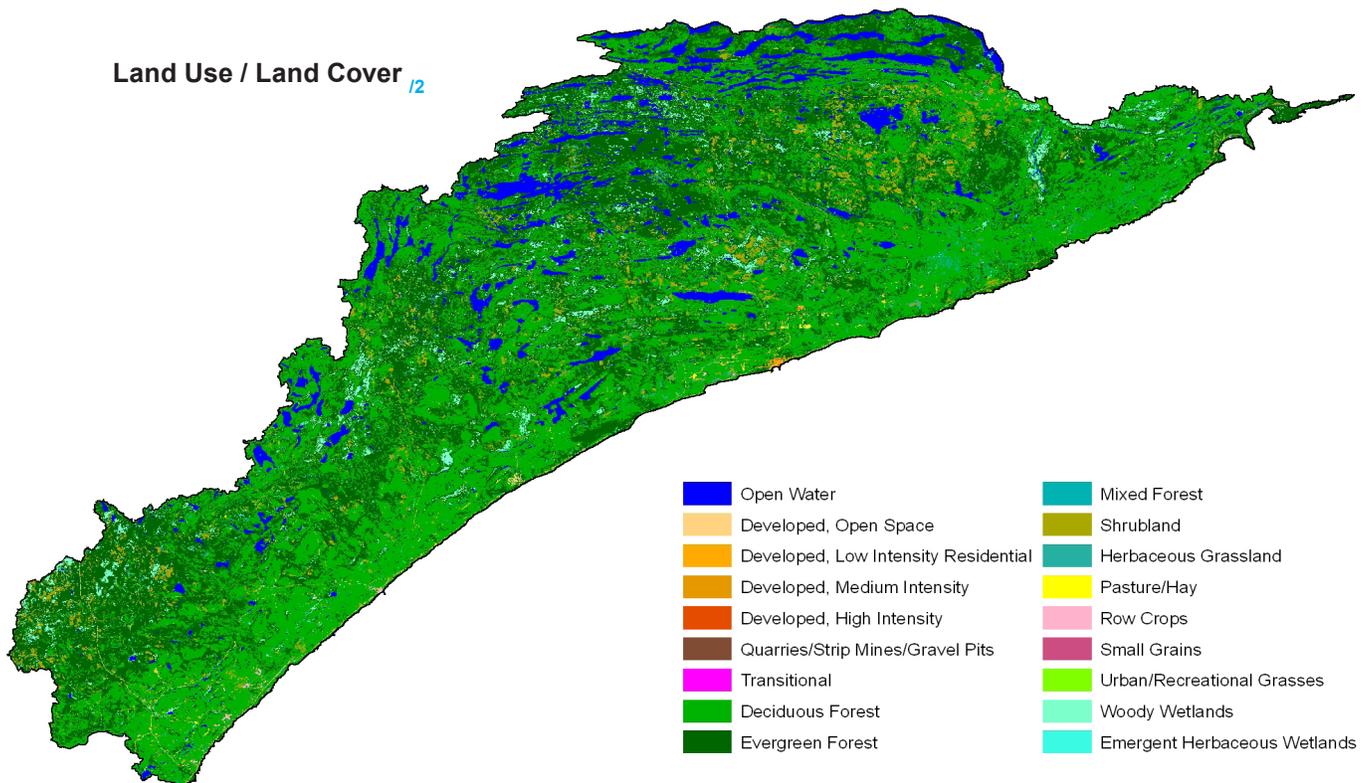
\* Ownership totals derived from 2007 MN DNR GAP Stewardship Coverage data and are the best suited estimation of land stewardship available on a statewide scale at time of publication. See the bibliography section of this document for further information.

## Ownership / Land Use

The watershed covers an area of 1,019,932 acres. Slightly more than fifty seven percent of the land in the watershed is Federally owned ( 582,694 acres). The second largest ownership type is State, with approximately 221,980 acres (21.8%), followed by Private with 146,979 acres (14.4%), Tribal with 43,499 acres (4.3%), Private major with 21,504 acres (2.1%), and Conservancy with 2,316 acres (0.2%). County lands account for the smallest ownership percentage, occupying 954 acres (0.1%).

Land use by ownership type is represented in the table below.

Land Use / Land Cover <sup>/2</sup>



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

Landcover/Use	Public		Private**		Tribal		Total Acres	Percent	
	Acres	% Public	Acres	% Private	Acres	% Tribal			
Forest	688,485	67.5%	146,921	14.4%	39,869	3.9%	875,275	85.9%	
Grass, etc	3,371	0.3%	1,660	0.2%	298	0.0%	5,329	0.5%	
Orchards	0	0.0%	0	0.0%	0	0.0%	0	0.0%	
Row Crops	335	0.0%	465	0.0%	13	0.0%	812	0.1%	
Shrub etc	29,785	2.9%	4,904	0.5%	255	0.0%	34,944	3.4%	
Wetlands	26,149	2.6%	3,447	0.3%	1,356	0.1%	30,952	3.0%	
Residential/Commercial	2,401	0.2%	3,350	0.3%	376	0.0%	6,127	0.6%	
Open Water*	54,709	5.4%	10,040	1.0%	1,239	0.1%	65,988	6.5%	
<b>Watershed Totals:</b>		<b>805,235</b>	<b>78.99%</b>	<b>170,786</b>	<b>16.8%</b>	<b>43,406</b>	<b>4.3%</b>	<b>1,019,427</b>	<b>100%</b>

\* ownership undetermined

\*\* includes private-major

**Physical Description (continued)**

		ACRES	cu. ft/sec	
<b>Stream Flow Data</b>	USGS 04010500 PIGEON RIVER AT MIDDLE FALLS NR GRAND PORTAGE MN	<b>Total Avg.</b>	432.7	
		<b>May – Sept. Avg. Yield</b>	672	
<b>Stream Data<sup>14</sup></b> (*Percent of Total HUC Stream Miles)		<b>MILES</b>	<b>PERCENT</b>	
	Total Miles – Major (100K Hydro GIS Layer)	2751	---	
	303d/TMDL Listed Streams (DEQ)	33	1.2%	
<b>Riparian Land Cover/Land Use<sup>15</sup></b> (Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)	<b>Land Use Type</b>	<b>Acres</b>	<b>Percent</b>	
	Forest	45,997	70.6%	
	Grain Crops	0	0.0%	
	Grass, etc	162	0.2%	
	Orchards	0	0.0%	
	Row Crops	29	0.0%	
	Shrub etc	615	0.9%	
	Wetlands	2,707	4.2%	
	Residential/Commercial	293	0.5%	
	Open Water*	15,386	23.6%	
	<b>Total Buffer Acres:</b>	<b>65,190</b>	100%	
<b>Crop and Pastureland Land Capability Class<sup>16</sup></b> (Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)	<b>1 – slight limitations</b>	0	0%	
	<b>2 – moderate limitations</b>	2,500	48%	
	<b>3 – severe limitations</b>	0	0%	
	<b>4 – very severe limitations</b>	0	0%	
	<b>5 – no erosion hazard, but other limitations</b>	0	0%	
	<b>6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest</b>	2,700	52%	
	<b>7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat</b>	0	0%	
	<b>8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply</b>	0	0%	
	<b>Total Croplands &amp; Pasturelands</b>	<b>5,200</b>	---	
	<b>TYPE OF LAND</b>	<b>ACRES</b>	<b>% of Irrigated Lands</b>	<b>% of Cropland</b>
<b>Irrigated Lands<sup>17</sup></b> (1997 NRI Estimates for Non- Federal Lands Only)	<b>Cultivated Cropland / Pastureland</b>	0	0%	0%
	<b>Uncultivated Cropland</b>	0	0%	0%
	<b>Total Irrigated Lands</b>	0	---	0%

## Assessment of Waters

The federal Clean Water Act (CWA) requires states to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet designated uses, such as drinking water, fishing and swimming.

The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity and mercury. A water body is “impaired” if it fails to meet one or more water quality standards. To identify and restore impaired waters, Section 303(d) of the Clean Water Act requires the Minnesota Pollution Control Agency (MPCA) to:

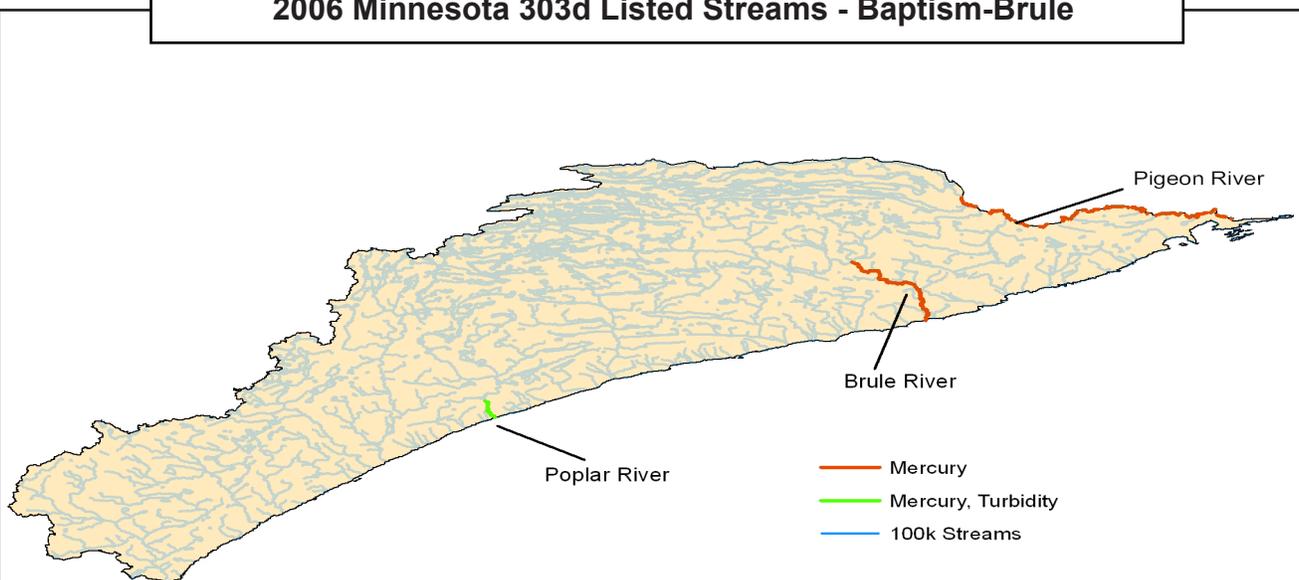
- Assess all waters of the state to determine if they meet water-quality standards
- List waters that do not meet standards (the 303d List) and update every other year
- Conduct TMDL studies in order to set pollutant reduction goals needed to restore waters.



Federal and state regulations and programs also require implementation of restoration measures to meet TMDLs. MPCA responsibilities include performing assessment activities, listing impaired waters, and conducting TMDLs in Minnesota. The agency also coordinates closely with other state and local agencies on restoration activities.

The Total Maximum Daily Load (TMDL) list is updated every two years (the next list will be approved in 2008). Following assessment of water quality data and an extensive public participation process, the draft TMDL list is submitted to the U.S. EPA for final approval.

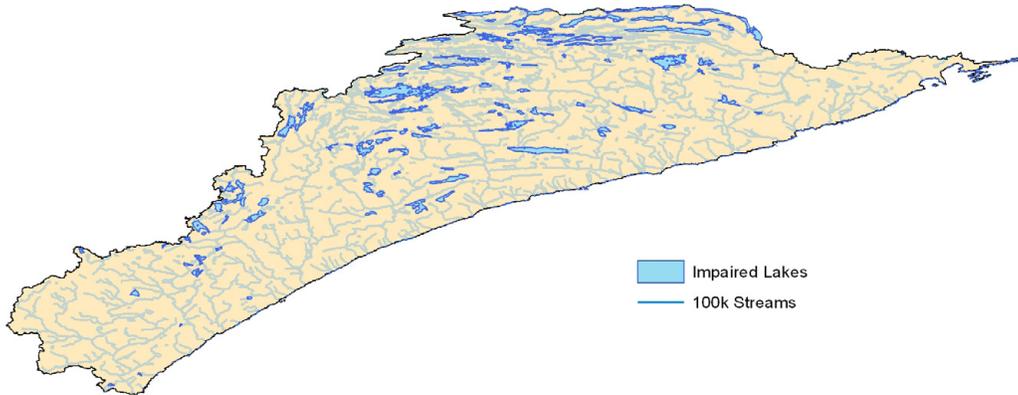
### 2006 Minnesota 303d Listed Streams - Baptism-Brule



Listed Stream	Impairment	Affected Use
Pigeon River South Fowl Lk to Pigeon Bay	Mercury	Aquatic Consumption
Brule River Greenwood R to Lk Superior	Mercury	Aquatic Consumption
Poplar River Superior Hiking Trail bridge to Lk Superior	Mercury, Turbidity	Aquatic Consumption and Aquatic Life

**Assessment of Waters (continued)**

**2006 Minnesota 303d Listed Lakes - Baptism-Brule**



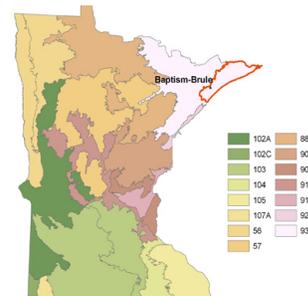
Listed Lake	Impairment	Affected Use	Listed Lake	Impairment	Affected Use	Listed Lake	Impairment	Affected Use
Superior	Hg, PCB	Aquatic Consumption	Poplar	Hg	Aquatic Consumption	Mit	Hg	Aquatic Consumption
Moosehorn	Hg	Aquatic Consumption	South	Hg	Aquatic Consumption	Pine	Hg	Aquatic Consumption
Tom	Hg	Aquatic Consumption	Dunn	Hg	Aquatic Consumption	Wampus	Hg	Aquatic Consumption
Esther	Hg	Aquatic Consumption	Mark	Hg	Aquatic Consumption	Leo	Hg	Aquatic Consumption
Devilfish	Hg	Aquatic Consumption	Pike	Hg	Aquatic Consumption	Squint	Hg	Aquatic Consumption
Otter	Hg	Aquatic Consumption	Deer Yard	Hg	Aquatic Consumption	Aspen	Hg	Aquatic Consumption
Chester	Hg	Aquatic Consumption	Vernon	Hg	Aquatic Consumption	Swamp	Hg	Aquatic Consumption
South Fowl	Hg	Aquatic Consumption	Swan	Hg	Aquatic Consumption	Morgan	Hg	Aquatic Consumption
John	Hg	Aquatic Consumption	Rush	Hg	Aquatic Consumption	Vista	Hg	Aquatic Consumption
North Fowl	Hg	Aquatic Consumption	Henson	Hg	Aquatic Consumption	Hungry Jack	Hg	Aquatic Consumption
Pine	Hg	Aquatic Consumption	Gaskin	Hg	Aquatic Consumption	Bearskin	Hg	Aquatic Consumption
East Pike	Hg	Aquatic Consumption	Cascade	Hg	Aquatic Consumption	Rose	Hg	Aquatic Consumption
Moose	Hg	Aquatic Consumption	Little Cascade	Hg	Aquatic Consumption	Duncan	Hg	Aquatic Consumption
Trout	Hg	Aquatic Consumption	Brule	Hg	Aquatic Consumption	McDonald	Hg	Aquatic Consumption
Carrot	Hg	Aquatic Consumption	Winchell	Hg, PCB	Aquatic Consumption	Hand	Hg	Aquatic Consumption
Greenwood	Hg	Aquatic Consumption	Barker	Hg	Aquatic Consumption	Johnson	Hg	Aquatic Consumption
West Pike	Hg	Aquatic Consumption	Caribou	Hg	Aquatic Consumption	Balsam	Hg	Aquatic Consumption
Northern Light	Hg	Aquatic Consumption	Clara	Hg	Aquatic Consumption	Delay	Hg	Aquatic Consumption
Mountain	Hg	Aquatic Consumption	Holly	Hg	Aquatic Consumption	Toohey	Hg	Aquatic Consumption
Elbow	Hg	Aquatic Consumption	White Pine	Hg	Aquatic Consumption	Finger	Hg	Aquatic Consumption
Musquash	Hg	Aquatic Consumption	Christine	Hg	Aquatic Consumption	Timber	Hg	Aquatic Consumption
Alder	Hg	Aquatic Consumption	Kinogami	Hg	Aquatic Consumption	Elbow	Hg	Aquatic Consumption
Crocodile	Hg	Aquatic Consumption	Gust	Hg	Aquatic Consumption	Frear	Hg	Aquatic Consumption
Swamper	Hg	Aquatic Consumption	Lichen	Hg	Aquatic Consumption	Cross River	Hg	Aquatic Consumption
Jim	Hg	Aquatic Consumption	Bouder	Hg	Aquatic Consumption	Benson	Hg	Aquatic Consumption
Clearwater	Hg	Aquatic Consumption	Tait	Hg	Aquatic Consumption	East	Hg	Aquatic Consumption
Devil Track	Hg	Aquatic Consumption	Juno	Hg	Aquatic Consumption	Crooked	Hg	Aquatic Consumption
East Bearskin	Hg	Aquatic Consumption	Star	Hg	Aquatic Consumption	Thunderbird	Hg	Aquatic Consumption
Flour	Hg	Aquatic Consumption	Homer	Hg	Aquatic Consumption	Ninemile	Hg	Aquatic Consumption
Pit	Hg	Aquatic Consumption	Upper Cone	Hg	Aquatic Consumption	Lupus	Hg	Aquatic Consumption
Two Island	Hg	Aquatic Consumption	Davis	Hg	Aquatic Consumption	Wilson	Hg	Aquatic Consumption
Dick	Hg	Aquatic Consumption	Crescent	Hg	Aquatic Consumption	Little Wilson	Hg	Aquatic Consumption
Little Trout	Hg	Aquatic Consumption	Marsh	Hg	Aquatic Consumption	Dam Five	Hg	Aquatic Consumption
Lower Trout	Hg	Aquatic Consumption	Moore	Hg	Aquatic Consumption	Whitefish	Hg	Aquatic Consumption
Ball Club	Hg	Aquatic Consumption	Sawbill	Hg	Aquatic Consumption	Organ	Hg	Aquatic Consumption
Kemo	Hg	Aquatic Consumption	Alton	Hg	Aquatic Consumption	Nipisiquit	Hg	Aquatic Consumption
Thrush	Hg	Aquatic Consumption	Dyers	Hg	Aquatic Consumption	Four Mile	Hg	Aquatic Consumption
Thrasher	Hg	Aquatic Consumption						

## Common Resource Areas

The Baptism-Brule Watershed encompasses a single common resource area, CRA 93A.1.<sup>/9</sup>

### 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.



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

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

The North Shore's geology is spectacular, with long ridges sloping towards the lake and the Sawtooth Mountains crowding the shoreline. Streams leap through cracks in the bedrock and form waterfalls, cascades and rapids over the ancient rocks.

Bedrock in the watershed is a complex of Precambrian volcanic and metamorphosed sedimentary rocks extensively intruded by dikes and sills. Bedrock in the North Shore area is predominantly a very thick succession of southeastward-dipping lava flows, the North Shore volcanic group, that overlies the metamorphosed sedimentary rocks exposed in the extreme northern part of the watershed. This rock sequence is intruded by numerous dikes and sills and by the Duluth Complex, which forms the bedrock in much of the area.

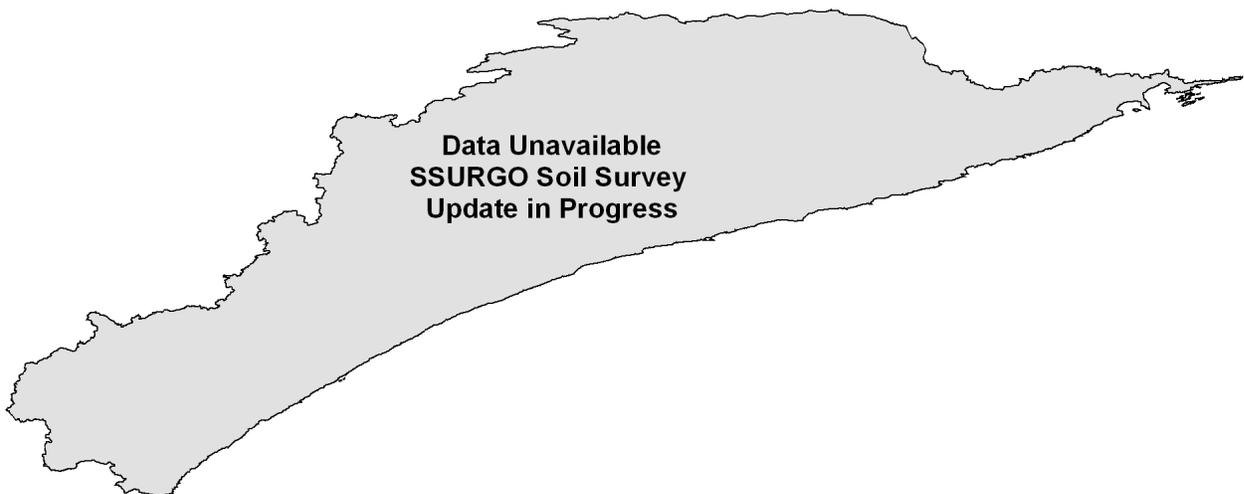
Unconsolidated glacial sediments in the Lake Superior watershed consist largely of red to brown sandy and stony till, outwash and ice-contact deposits of sand and gravel, and red silty to clayey glacial lake deposits. These sediments were laid down by advances and subsequent wasting of several ice sheets that moved southwestward out of the Lake Superior trough. The deposits are less than 50 ft (15m) thick over most of the North Shore area and less than 6 ft (1.8 m) in much of the area, especially along the lakeshore in the northern part. Numerous wetlands, associated with the high water table and hummocky topography of glacial terrain, occur in the watershed. Many of the wetlands contain shallow peat deposits.

## Drainage Classification

---

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil.

Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



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

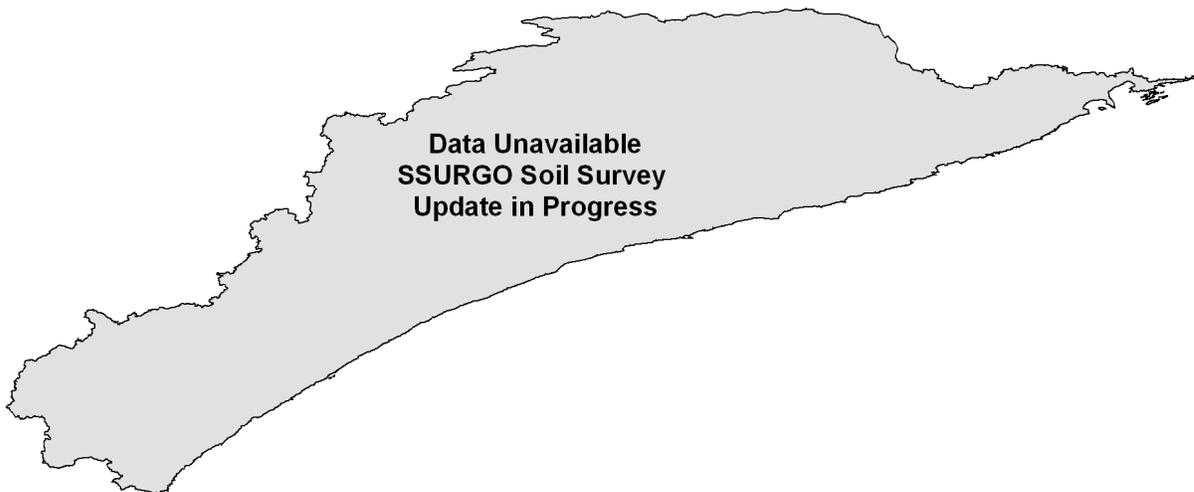
## Farmland Classification

---

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

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

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



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

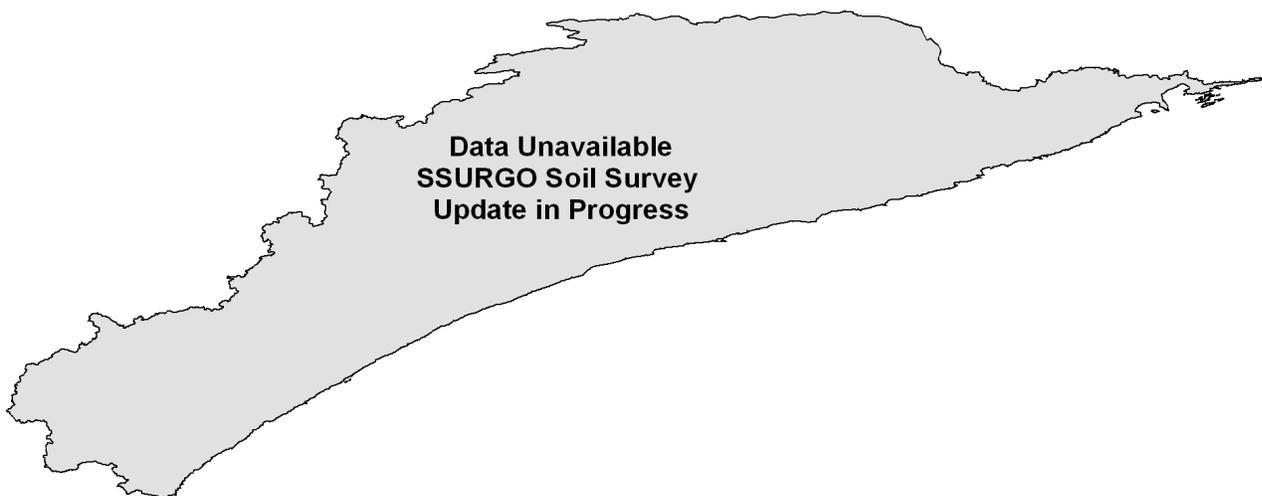
## Hydric Soils

---

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

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

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



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

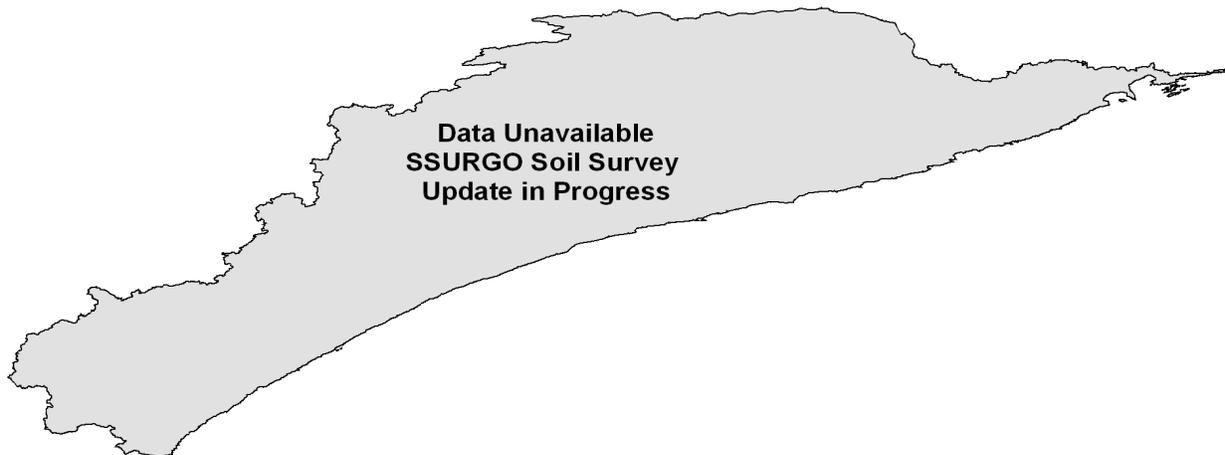
## Highly Erodible Land (HEL)

---

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

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

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



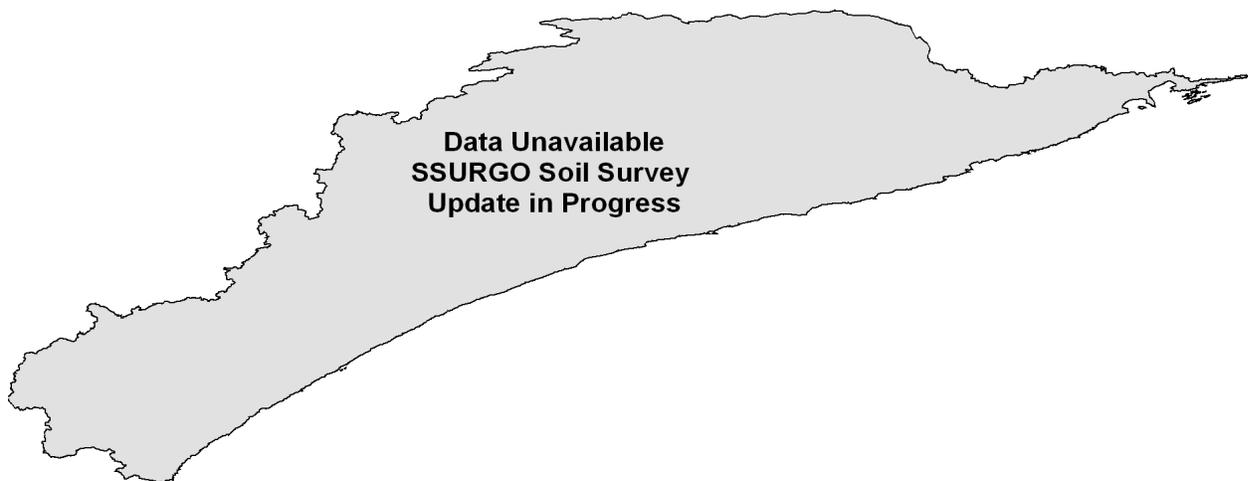
Visit the online Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables. Visit the Soil Data Mart at <http://soildatamart.usda.gov> to download SSURGO certified soil tabular and spatial data.

## Land Capability Classification

---

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management.

The criteria used in grouping the soils does not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



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

**Performance Results System Data**

Watershed Name: Baptism - Brule				Watershed Number: 04010101						
PRS Performance Measures	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	TOTAL
Total Conservation Systems Planned (acres)	0	1,123	0	245	0	N/A	44,863	541	181	46,953
Total Conservation Systems Applied (acres)	0	1,450	0	1,109	1,109	N/A	0	137	140	3,945
<b>Conservation Practices</b>										
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	312	360	50	0	N/A	N/A	N/A	N/A	722
Total Nutrient Management (590) (Acres)	0	114	0	0	0	0	0	0	0	114
Pest Management Systems Applied (595A) (Acres)	0	0	0	0	0	0	0	0	0	0
Prescribed Grazing 528a (acres)	0	109	0	0	0	0	0	0	0	109
Tree & Shrub Establishment (612) (acres)	0	200	263	244	320	0	0	0	5	1,032
Residue Management (329A-C) (acres)	0	0	0	0	0	0	0	0	0	0
Total Wildlife Habitat (644 - 645) (acres)	0	0	20	418	1	0	418	116	4	977
Total Wetlands Created, Restored, or Enhanced (acres)	0	13	1	3	1	42	0	0	0	60
<b>Acres enrolled in Farmbill Programs</b>										
Conservation Reserve Program	0	0	0	0	0	N/A	0	115	0	115
Wetlands Reserve Program	0	0	0	0	0	N/A	0	0	0	0
Environmental Quality Incentives Program	0	900	80	889	482	N/A	0	0	140	2,491
Wildlife Habitat Incentive Program	0	0	20	120	19	N/A	0	23	0	182
Farmland Protection Program	0	0	0	0	0	N/A	0	0	0	0

## RESOURCE CONCERNS

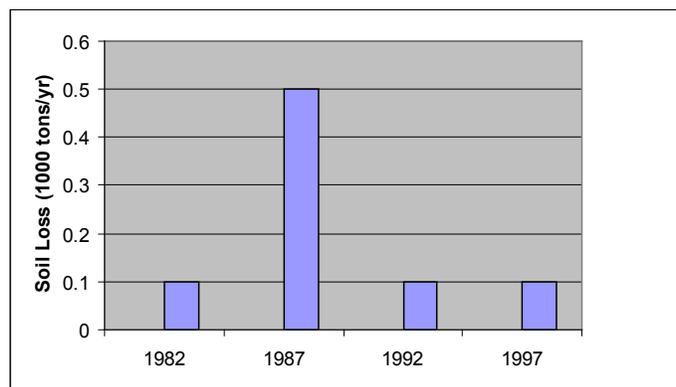
County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Soil Quality, Excessive Erosion.** Soil erosion from exposed surface areas, streambank and lakeshore areas, and roadside erosion are major conservation issues in the watershed.
- 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, land-owners, 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.
- Shoreline Management.** Priority is given to promoting the environmental protection and orderly growth of the North Shore of Lake Superior. Local districts seek to regulate and manage the density of development on and adjacent to shorelines, and develop and enforce wastewater and stormwater regulations within the “North Shore Management Zone”.
- 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. Cook County is committed to the successful practice and mitigation of policy yielding “no net loss” in viable wetlands.



### NRI Erosion Estimates

- Sheet and rill erosion by water on the cropland and pastureland in 1982 indicated 100 tons annually, increasing to 500 tons annually in 1987, and declining to 100 tons a year in 1992, where it remained in 1997.
- At the time of reporting NRI estimates for wind erosion rates between between the years 1982 1997 are not available for this HUC. <sup>13</sup>



**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>Adoxa moschatellina</i>	Moschatel	Botanical	<i>Littorella uniflora</i>	American Shore-plantain	Botanical
<i>Agrostis geminata</i>	Twin Bentgrass	Botanical	<i>Lobaria quercizans</i>	Smooth lungwort	Botanical
<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives	Botanical	<i>Luzula parviflora</i> ssp. <i>melanocarpa</i>	Small-flowered Woodrush	Botanical
<i>Anaptychia setifera</i>	Hanging fringe lichen	Botanical	<i>Lycaeides idas nabokovi</i>	Nabokov's Blue	Zoological
<i>Arabis holboellii</i> var. <i>retrofracta</i>	Holboell's Rock-cress	Botanical	<i>Moehringia macrophylla</i>	Large-leaved Sandwort	Botanical
<i>Arnica lonchophylla</i>	Long-leaved Arnica	Botanical	<i>Muhlenbergia uniflora</i>	One Flowered Muhly	Botanical
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Botanical	<i>Myotis septentrionalis</i>	Northern Myotis	Zoological
<i>Botrychium lanceolatum</i>	Triangle Moonwort	Botanical	<i>Najas gracillima</i>	Thread-like Naiad	Botanical
<i>Botrychium lunaria</i>	Common Moonwort	Botanical	<i>Nymphaea leibergii</i>	Small White Water-lily	Botanical
<i>Botrychium minganense</i>	Mingan Moonwort	Botanical	<i>Ophiogomphus anomalis</i>	Extra-striped Snaketail	Zoological
<i>Botrychium pallidum</i>	Pale Moonwort	Botanical	<i>Osmorhiza berteroi</i>	Chilean Sweet Cicely	Botanical
<i>Botrychium rugulosum</i>	St. Lawrence Grapefern	Botanical	<i>Osmorhiza depauperata</i>	Blunt-fruited Sweet Cicely	Botanical
<i>Botrychium simplex</i>	Least Moonwort	Botanical	<i>Oxytropis viscida</i>	Sticky Locoweed	Botanical
<i>Buteo lineatus</i>	Red-shouldered Hawk	Zoological	<i>Parmelia stictica</i>	A Species of Lichen	Botanical
<i>Calamagrostis lacustris</i>	Marsh Reedgrass	Botanical	<i>Peltigera venosa</i>	Fan lichen	Botanical
<i>Calamagrostis purpurascens</i>	Purple Reedgrass	Botanical	<i>Phacelia franklinii</i>	Franklin's Phacelia	Botanical
<i>Carex exilis</i>	Coastal Sedge	Botanical	<i>Pinguicula vulgaris</i>	Butterwort	Botanical
<i>Carex flava</i>	Yellow Sedge	Botanical	<i>Platanthera clavellata</i>	Club-spur Orchid	Botanical
<i>Carex katahdinensis</i>	Katahdin Sedge	Botanical	<i>Polygonum viviparum</i>	Alpine Bistort	Botanical
<i>Carex michauxiana</i>	Michaux's Sedge	Botanical	<i>Polystichum braunii</i>	Braun's Holly Fern	Botanical
<i>Carex pallescens</i>	Pale Sedge	Botanical	<i>Potamogeton vaseyi</i>	Vasey's Pondweed	Botanical
<i>Carex praticola</i>	Prairie Sedge	Botanical	<i>Pseudocypbellaria crocata</i>	Yellow specklebelly	Botanical
<i>Carex supina</i> var. <i>spaniocarpa</i>	Weak Arctic Sedge	Botanical	<i>Pyrola minor</i>	Small Shinleaf	Botanical
<i>Carex woodii</i>	Wood's Sedge	Botanical	<i>Ranunculus lapponicus</i>	Lapland Buttercup	Botanical
<i>Carex xerantica</i>	Dry Sedge	Botanical	<i>Rhynchospora fusca</i>	Sooty-colored Beak-rush	Botanical
<i>Castilleja septentrionalis</i>	Northern Paintbrush	Botanical	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotty Pearlwort	Botanical
<i>Cetraria aurescens</i>	Eastern candlewas lichen	Botanical	<i>Salix pellita</i>	Satiny Willow	Botanical
<i>Claytonia caroliniana</i>	Carolina Spring-beauty	Botanical	<i>Saxifraga cernua</i>	Nodding Saxifrage	Botanical
<i>Coturnicops noveboracensis</i>	Yellow Rail	Zoological	<i>Saxifraga paniculata</i>	Encrusted Saxifrage	Botanical
<i>Crataegus douglasii</i>	Black Hawthorn	Botanical	<i>Schistostegia pennata</i>	Luminous Moss	Botanical
<i>Deschampsia flexuosa</i>	Slender Hairgrass	Botanical	<i>Scirpus clintonii</i>	Clinton's Bulrush	Botanical
<i>Draba arabisans</i>	Rock Whitlow-grass	Botanical	<i>Senecio indecorus</i>	Elegant Grousel	Botanical
<i>Drosera anglica</i>	English Sundew	Botanical	<i>Sorex fumeus</i>	Smoky Shrew	Zoological
<i>Eleocharis nitida</i>	Neat Spike-rush	Botanical	<i>Sparganium glomeratum</i>	Clustered Bur-reed	Botanical
<i>Eleocharis quinqueflora</i>	Few-flowered Spike-rush	Botanical	<i>Subularia aquatica</i>	Awlwort	Botanical
<i>Euphrasia hudsoniana</i>	Hudson Bay Eyebright	Botanical	<i>Tofieldia pusilla</i>	Small False Asphodel	Botanical
<i>Falco peregrinus</i>	Peregrine Falcon	Zoological	<i>Torreyochloa pallida</i>	Torrey's Manna-grass	Botanical
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Zoological	<i>Trimorpha acris</i> var. <i>asteroides</i>	Bitter Fleabane	Botanical
<i>Huperzia porophila</i>	Rock Clubmoss	Botanical	<i>Vaccinium uliginosum</i>	Alpine Bilberry	Botanical
<i>Juncus stygius</i> var. <i>americanus</i>	Bog Rush	Botanical	<i>Waldsteinia fragarioides</i>	Barren Strawberry	Botanical
<i>Juniperus horizontalis</i>	Creeping Juniper	Botanical	<i>Woodsia alpina</i>	Alpine Woodsia	Botanical
<i>Lasmigona compressa</i>	Creek Heelsplitter	Zoological	<i>Woodsia glabella</i>	Smooth Woodsia	Botanical
<i>Listera auriculata</i>	Auricled Twayblade	Botanical	<i>Woodsia scopulina</i>	Rocky Mountain Woodsia	Botanical
<i>Listera convallarioides</i>	Broad-lipped Twayblade	Botanical	<i>Xyris montana</i>	Montane Yellow-eyed Grass	Botanical

## Socioeconomic and Agricultural Data (Relevant)

Estimations for the Baptism-Brule subbasin indicate a current population of approximately 5,497 people. Median household income throughout the district is \$37,520 yearly, roughly 79% of the national average. Unemployment is estimated at 4.2%, and approximately 9% of the residents in the watershed live below the national poverty level.



Assessment estimates indicate 22 farms located in the watershed. Approximately eighty two percent of the operations are less than 180 acres in size, eighteen percent are from 180 to 1000 acres in size, and no farms in this HUC appear to be greater than 1000 acres in size. Of the 20 operators in the watershed, 47 percent are full-time producers not reliant on off-farm income.

<b>(MN) HUC# 4010101</b>		<b>Total Acres:</b>	<b>1,019,923</b>
<b>Population Data*</b>	Watershed Population	5,497	
	Unemployment Rate	4.2%	
	Median Household Income	37,520	
	% below poverty level	9%	
	Median Value of Home	91,400	
<b>Farms</b>	# of Farms	22	
	# of Operators	20	<b>Percent</b>
	# of Full Time Operators	9	47%
	# of Part Time Operators	10	53%
	<b>Total Crop/Pasturelands:</b>	<b>5,200</b>	<b>0.5%</b>
<b>Farm Size</b>	1 to 49 Acres	16	30%
	50 to 179 Acres	27	52%
	180 to 499 Acres	8	15%
	500 to 999 Acres	2	3%
	1,000 Acres or more	0	0%
<b>Livestock &amp; Poultry</b>	Cattle - Beef	22	11%
	Cattle - Dairy	0	0%
	Chicken	11	6%
	Swine	12	6%
	Turkey	0	0%
	Other	153	77%
	<b>Animal Count Total:</b>	<b>198</b>	
<b>Total Permitted AFOs:</b>	<b>1</b>		
<b>Chemicals (Acres Applied)</b>	Insecticides	0	
	Herbicides	0	
	Wormicides	0	
	Fruiticides	0	
	<b>Total Acres Treated</b>	<b>0</b>	
	<b>% State Chemical Totals</b>	<b>0.0%</b>	

\* 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

- **Cook County Sustainable Devel. Initiative**  
Cook County SWCD, MN BWSR
- **Lake Superior Shoreline Stabilization**  
Cook, Lake, and St Louis County SWCD
- **Lake Superior Coastal Program**  
MN DNR, NOAA
- **Flute Reed River Watershed Project**  
Cook County SWCD
- **Watershed Guardian Program**  
Area SWCDs, Citizens, Cargill Inc.
- **Lake Superior Shoreline Stabilization Project**  
Minnesota Board of Water and Soil Resources
- **Lake Superior Erosion Control/Bluff Stability**  
Lake Superior Association of SWCDs
- **Lutsen and the Poplar River Watershed BMP**  
Cook County Planning Department
- **Enhancement of Lake Superior's Water Quality**  
North Shore Management Board
- **Gunflint Trail Corridor Management Plan**  
Gunflint Trail Corridor Committee, ARDC
- **Poplar River Total Maximum Daily Load Plan**  
Cook County SWCD, MPCA
- **Grand Marais Stormwater Management Plan**  
Cook County SWCD, Lake Superior Coastal Program

\* 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

- **Arrowhead Region Development Commission**  
221 West 1st Street Duluth, MN 55802  
Phone (218) 722-5545
- **Minnesota Sea Grant**  
2305 E 5th Street Duluth, MN 55805  
Phone (218) 726-8106
- **Blandin Foundation**  
100 N. Pokegama Ave Grand Rapids, MN 55744  
Phone (218) 326-0523
- **Minnesota Pollution Control Agency - Duluth**  
525 Lake Avenue S, Suite 400 Duluth, MN 55802  
Phone: (218) 723-4663
- **Cook County SWCD**  
411 W 2nd St, Grand Marais, MN 55604  
Phone (218) 387-3647
- **North Shore Management Board c/o ARDC**  
221 W 1st St. Duluth, MN 55802  
Phone 1-800-232-0707
- **Lake County SWCD**  
601 3rd Ave, PO Box 14, Two Harbors, MN 55616  
Phone (218) 834-8370
- **Great Lakes Commission**  
2805 S. Ind. Hwy, Suite 100 Ann Arbor, MI 48104  
Phone: (734) 971-9135

## 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](http://www.fsa.usda.gov/crpstorpt/07Approved/r1sumyr/mn.htm) (7/30/04). CREP Acres: <http://www.bwsr.state.mn.us/easements/crep/easementssummary.html> (7/31/03). WRP Acres: NRCS (8/16/04). Data were obtained by county and adjusted by percent of HUC in the county.

12. Socioeconomic and Agricultural Census Data were taken from the U.S. Population Census, 2000 and 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of zip code area in the HUC, depending on the level of data available. 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.