Polk County Local Water Plan

5 Year Update/Approved 9/13/17

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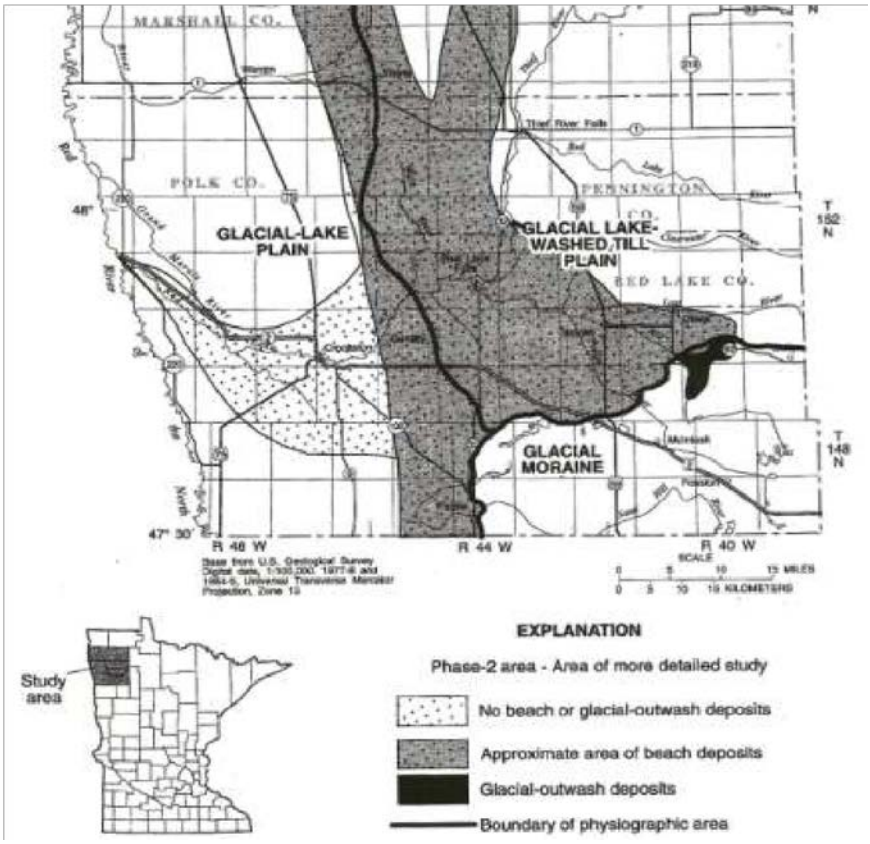
I. Executive Summary

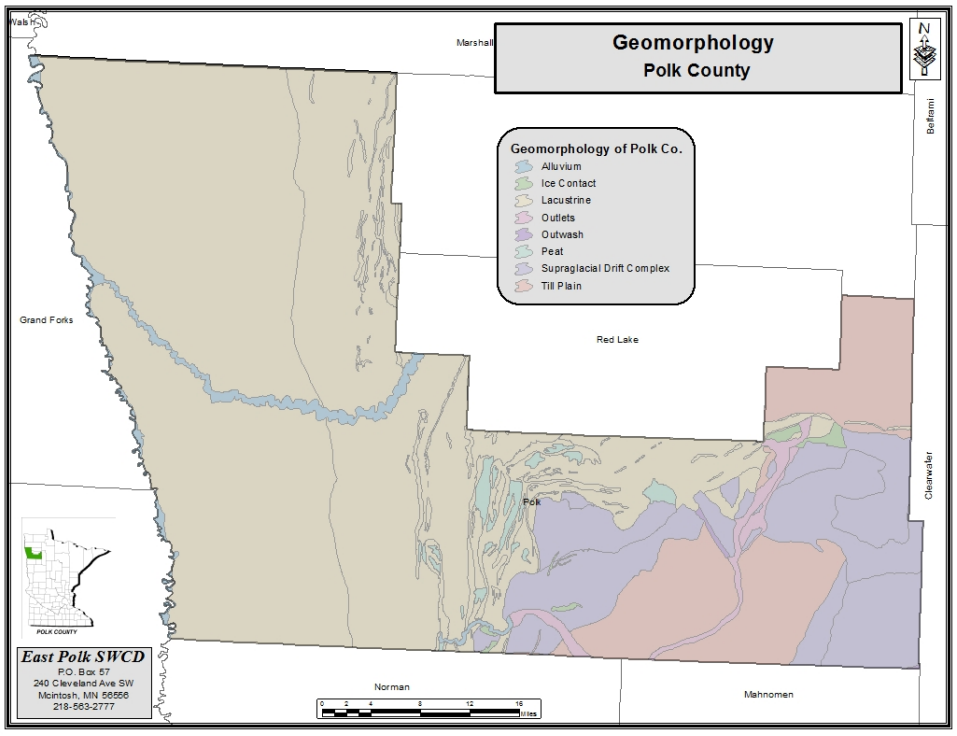
Introduction

Polk County is located in northwest Minnesota. According to the U.S. Census Bureau, the county has a total area of 1,998 square miles, of which 1,971 square miles are land and 27 square miles are water. According to the April 1, 2010 census, the population of Polk County was 31,600. Projected population change as reported by the Minnesota Demographic Center, (June, 2007) show the population increases slightly (32,610) by the year 2015. The County seat is located in Crookston and the largest community is East Grand Forks. There are 58 townships and 15 cities within the county.

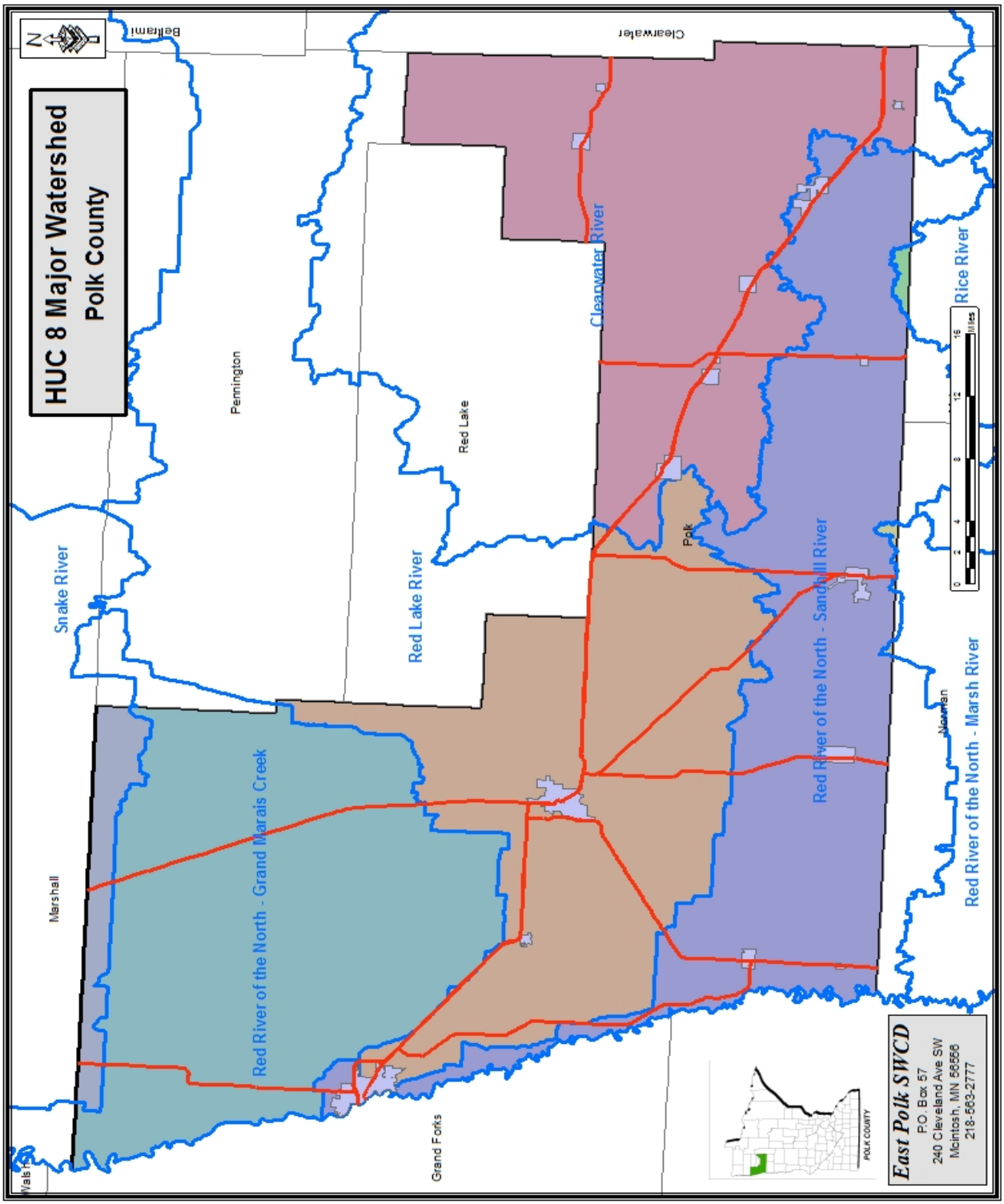
Polk County includes three general physiographic areas; glacial-lake plain, glacial lake-washed till plain, and glacial moraine area. The western third of Polk County is glacial-lake plain. This area is extremely flat, sloping only a few feet per mile. At one time it was the floor of glacial Lake Agassiz. The silty loam sediments that accumulated there formed fertile soils making one of North America's most fertile farming regions. The glacial lake-washed till plain is flat to gently rolling area that has local relief up to 15 feet and is located mid-county. The western part of the glacial lake-washed till plain is traversed by north-south and northeast-southwest trending long, narrow beach ridges, some are as much as 20 feet high. The glacial moraine is an area of hills and depressions that has local relief up to 150 feet and is present in the eastern part of Polk County. (*U.S. Geological Survey, Water-Resources Investigation Report 95-4201, 1996*).



Polk County lies within the Red River of the North Basin Watershed. Due to the unique lake/river basin soils left by Glacial Lake Agassiz the primary land use of Polk County is agriculturally based, approximately 78%. The 2012 Census of Agriculture County Data from the USDA National Agriculture Statistic Service shows the number of farms in Polk County is 1,322 with the average farm size at 828 acres. The total cropland acres are991,405, with 9,423 acres being irrigated land. Land use practices in the beach ridge areas have previously been gravel mining and agriculture. These areas are now trending toward the restoration of pre-settlement conditions.



Four major watersheds are predominant within the jurisdictional boundaries of Polk County. They include the *Grand Marais Creek, Red Lake River, Sand Hill River and the Clearwater River Watersheds*. Three other major watersheds have small acreage within the County. They are the *Wild Rice, Snake, and Marsh Watersheds.*


HUC 8 Major Watershed
Polk County
Beltrami
Clearwater
Pennington
Red Lake
Clearwater River
Rice River
Snake River
Red Lake River
Polk
Red River of the North - Sandhill River
Norman
Marshall
Red River of the North - Grand Marais Creek
Red River of the North - Marsh River
Grand Forks
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
McIntosh, MN 56556
218-563-2777

Purpose of the Local Water Management Plan:

The purpose of this updated Local Water Management Plan (LWMP) is to identify existing and potential problems and opportunities for protection, management and development of water resources and related land resources in Polk County. Pursuant to the requirements of Minn. Stat. 103B311 subd.4, the five requirements of this plan are as follows:

1. The plan must cover the entire county.

2. The plan must address problems in the context of watershed units and groundwater systems.

3. The plan must be based upon principals of sound hydrologic management of water, effective environmental protection, and efficient management.

4. The plan must be consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or ground water system.

5. The plan will cover a ten year period (2012 – 2022) with an implementation plan that will cover a five year period (2012 – 2017) and will then be updated for the remaining five years.

Polk County Local Water Management Plan's Update Process

The Polk County Water Plan focuses on water and related land resource issues. The county has gathered and studied available information relating to the physical environment, including, but not limited to, the surface and ground water resources, and their related land use.
Concerns were identified, analyzed, and prioritized by the Polk County Water Plan Committee within the context of the watershed units and ground water systems where appropriate. The plan applies to the entire area within the county.

The Polk County Water Plan is coordinated and administered by the East Polk Soil and Water Conservation District and the West Polk Soil and Water Conservation District.
The Polk County Water Plan (previously known as the Polk County Comprehensive Local Water Plan) was first developed and approved by the Minnesota Board of Water and Soil Resources in 1990. It was developed as a five year plan and was updated in 1997 (the 1990-1995 Plan was granted a two year extension). The 1997-2002 Plan was granted a two year extension. The 2005 to 2009 plan was also granted a two year extension which expired December 31, 2011.

Priority Concerns of Polk County Priority Concern #1
The Polk County Local Water Management Plan will focus on protection and enhancement of surface water quality. Specific areas of focus will be:

- Lake Region in the eastern part of the county, with specific focus on the human impacts.
    - Increases in development around smaller, non-recreational lakes and larger wetland complexes should be assessed to determine if adverse impacts have affected the water quality of these smaller bodies of water. Reference the Sand Hill River Watershed and Grand Marais Watershed WRAPs.
    - For nearly all of the lakes in this ecoregion phosphorus is the limiting factor. Major management efforts related to water quality are directed at limiting the amount of phosphorus loading into the lakes. o Sediment loading has also become a major concern to the water quality of the lakes. Proper land use management and implementation of Best Management Practices needs to be analyzed and addressed. Reference the Sand Hill River Watershed TMDL and the Minnesota Buffer Law at http://bwsr.state.mn.us/buffers/ .
- Surface water and ground waters in the western part of the county. o The City of East Grand Forks receives its public water supply from the Red Lake River.
    - The Red Lake River is impaired for turbidity and management efforts should focus on sediment loading into the Red Lake River and its tributaries.
- In addition to the above mentions specific areas of concern for Polk County, The County Board, Watershed Districts and SWCD's will actively pursue efforts to address surface water quality concerns within the county.
- Although surface water is of primary concern for Polk County we will be responsive to the need to monitor and protect our groundwater resources. We will participate to our fullest capacity but state and federal agencies such as Minnesota Department of Health (MDH) and United States Geological Survey (USGS) will need to be the primary source for groundwater protection and management.

Priority Concern #2
Polk County is subject to frequent flooding. Some factors such as topography and increase precipitation are unmanageable. Other factors such as flood plain encroachment, channelization of waterways, land use practices and effective private drainage into public systems, are factors that can be influenced by *Best Management Practices.*

- Polk County Local Water Management Plan will focus on the quantity of water passing through the County and its associated watersheds by inventorying, assessing and evaluating the drainage infrastructure.

Priority Concern #3
Polk County is concerned with the preservation and enhancement of its natural resources. The geology of Polk County is divided into 3 distinct areas; the glacial-lake plain, glacial lake beach ridges, and washed glacial till plain. These major areas, because of their size, unique geographical features, and wide diversity of natural resources are of significant benefit to the area and citizens.

- Polk County in cooperation with other local, state, and federal agencies will work to restore, enhance and protect these areas through programs and projects that accomplish this; cautious it is not done at the expense of the local economy.

Priority Concern #4

Polk County Local Water Management Plan will identify any new or yet to date undiscovered exotic and invasive species for prevention and management practices and will manage for any existing known species. Reference the Minnesota Prairie Conservation Plan at http://www.dnr.state.mn.us/prairieplan/index.html

Consistency with Other Plans

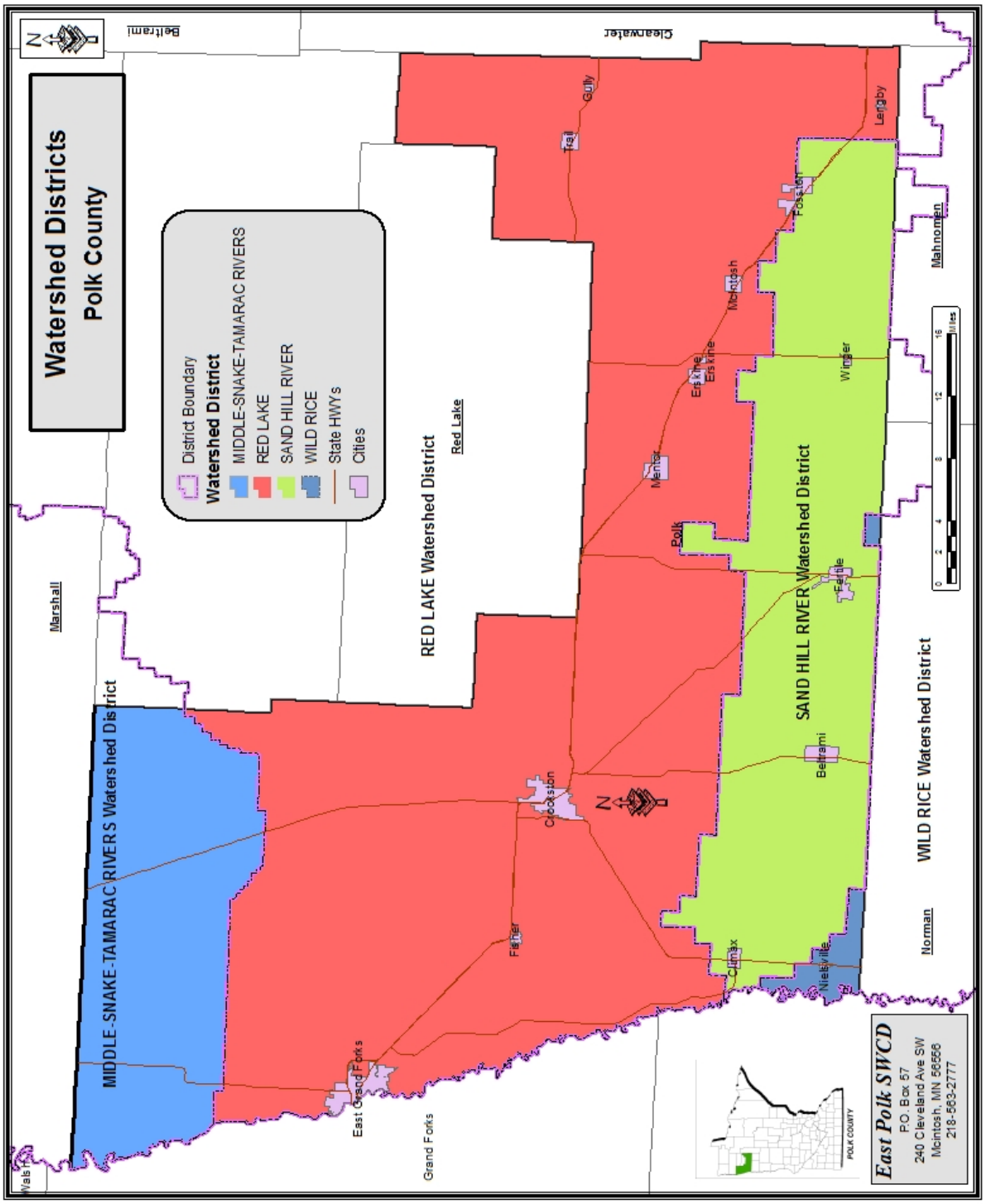
In preparation of the Polk County Local Water Plan the most recent plans from several entities were examined to ensure consistency with their concerns. Major plans reviewed were the Sand Hill Watershed District Watershed Management Plan, Sand Hill River Watershed WRAPs, Red Lake River Watershed One Watershed One Plan, .Red Lake River Watershed WRAPs. Local plans include Local Water Plans from adjacent counties, and local annual plans from SWCD's and Polk County Environmental Services. The Polk County Local Water Management Plan Update has utilized appropriate action items to support these plans and is consistent with goals and objectives presented in these plans.

The plan is also based on key economic and environmental principles, and is consistent with other plans that exist for Polk County, including Watershed Districts, Soil and Water Conservation Districts, Environmental Service agencies, Red River Valley Basin organizations, and appropriate state and federal agencies.

The plan also takes into consideration the adjacent County Local Water Management Plans in its water management strategies. All the river systems flowing through Polk County are influenced by watersheds that go beyond the jurisdictional boundary of Polk County, therefore to manage water on a watershed bases coordination with adjacent counties with common watersheds to Polk County will be required.

The five major watersheds that have drainage areas within the boundaries of Polk County include the *Grand Marais Creek, Red Lake River, Clearwater River Watersheds*, which are within the boundaries of the Red Lake Watershed District, *Snake River Watershed* which is in the Middle-Snake-Tamarac Rivers Watershed District, and the *Sand Hill River* which is the boundary for the Sand Hill River Watershed District. Having been an active participant in the updating processes of the Red Lake Watershed District Overall Plan, which was updated in 2006, and the Sand Hill River Watershed District Overall Plan in 2012 it is the intentions of Polk County Board of Commissioners and the Board of Supervisors for the West and East Polk SWCDs to recognize these Watershed District overall plans as a major reference documents for the implementation strategies for the priority concerns identified in the Polk County Local Water Management Plan. We support this approach based on the principles that water management is best managed on a comprehensive watershed basis. We realize we only make up portions of four of the sub-

watersheds addressed in these 2 Watershed overall plans. We intend to reference these frequently as we proceed to implement local water management in our county.



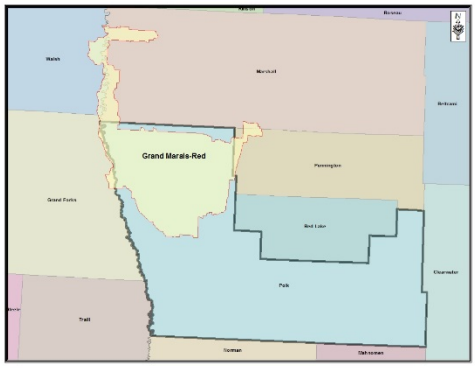
Watersheds in Polk County

Under legislative mandate, revisions to County Water Plans must be written within a watershed context. The purpose of this requirement is to ensure that counties look beyond the jurisdictional boundaries when making assessments and goals for water quality issues. By doing this, the county will be able to identify trends, problems and opportunities that are specific to a watershed rather than assuming the problem or issue is confined to political boundaries.

For the County to have an enduring impact on water management issues on a watershed basis, be it for water quality or quantity Polk County will need to implement actions that are in concert with those of other jurisdictions within a watershed such as other counties, SWCDs, or in the case of Polk County, Watershed Districts.

Four major watersheds are predominant within the jurisdictional boundaries of Polk County. They include the *Grand Marais Creek, Red Lake River, Sand Hill River and the Clearwater River Watersheds*. Three other major watersheds have small acreage within the County. They are the *Wild Rice, Snake, and Marsh Watersheds*.

Grand Marais Creek Watershed



The Grand Marais Creek Watershed lies in the northwestern portion of Polk County. It outlets into the Red River approximately nine miles north of East Grand Forks and begins just west of the Goose Lake Swamp area. The watershed is located mainly within the Red River Valley ecoregion with the extreme eastern potion entering the Glacial Lake Agassiz/Aspen Parklands ecoregion. It totals 466 square miles with portions in Polk, Marshall and Pennington Counties in Minnesota; North Dakota, counties include Walsh and Grand Forks. In Polk County, the watershed includes 358 square miles, making up 76.9 percent of the watershed. Polk County communities within this watershed are: Angus, Euclid, Sherack, and Tabor. (Reference NRCS Rapid Watershed Assessment for more information). Soil textures range from fine in the western two-thirds of the watershed to sandy-loam/fine-loam in the eastern third of the watershed. The area consists largely of agricultural land (94 percent), but is also made up forest, wetlands, urban and grassland. Elevations range from 1000 feet mean sea level (msl) in the east to 800 feet msl along the Red River of the North.

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022281.pdf

In Polk County the majority of the watershed lies within the Agassiz Lake Plain. Beach ridge areas of the watershed can be found in Helgeland, Brandt, Belgium and Parnell Townships. No lakes are located within this watershed. Land use is primarily agriculture production and is extensively drained. Few wetlands

remain in the Agassiz Lake Plain. Wetlands can be found in the beach ridge areas, and the potential for calcareous fens exists in these areas.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters.

The following information is taken from the One Watershed One Plan (1W1P).. The Grand Marais watershed is dominated by private lands in agricultural production and a series of ditches that drain into the Grand Marais Creek. The portion of this watershed west of U.S. Highway 75 is almost 100 percent agricultural land. West of U.S. Highway 75, narrow bands of natural lands are found along the Red River and along the Grand Marais Creek. East of U.S. Highway 75, there is a mix of grasslands and agricultural lands with some wetlands. Two WMAs in this area also provide some quality habitats; however, CRP lands provide the majority of grassland and wetland habitats. This area east of U.S. Highway 75 lies along the Campbell Beach Ridge.

Quality habitats in the western portion of this subwatershed are limited to the areas adjacent to Grand Marais Creek and the Red River. These habitats provide seasonal and permanent homes to a variety of species including game species such as white-tailed deer and waterfowl. Quality habitats in the eastern portion of the subwatershed include grasslands, wetlands and some brushlands. These areas provide seasonal and permanent habitats to a variety of species including game species such as white-tailed deer, prairie chicken and sharp-tail grouse. The prairie chicken population is declining due to loss of grassland habitat coming out of CRP and wet summers 2015-2016 (poor chick survival/nest failure).

The natural outlet to the Grand Marais was abandoned when the Polk County Cutoff Ditch (a legal drainage system) was created in the early 1900's, cutting off the 6-mile corridor of the original natural channel. This 1-mile legal drainage ditch had eroded and exhibited significant head cutting, resulting in banks failing well upstream, the loss of adjacent land, and supplied a significant sediment loading source potential to the Red River. The original 6 mile outlet channel had accumulated sediment over the past 100 years with minimal ability to maintain its natural state, leading to the loss of the natural resource benefits as well as a hydraulically stable outlet.

Construction of RLWD Project 60FF (Cutoff Ditch Stabilization Project) and 60F (Grand Marais Outlet Restoration Project) was completed in 2015. As a result, the Cutoff Ditch has been stabilized and the original Grand Marais natural outlet channel corridor has been restored. Project 60FF reconstructed the Cutoff Ditch to the original channel slope and provides bank slope stability all the way to the confluence with the Red River. Grade and slope stabilization was provided with two sheet pile drop structure installations, 4:1 and 5.5:1 side slopes, and multiple in bank subsurface drainage technics (perforated drain tile, clay plugs, coarse filter aggregate outlets, and perforated drain tile outlets) to protect the side slopes from perpetual sloughing. Project 60F diverts low flows from the cutoff ditch to the original 6 mile outlet

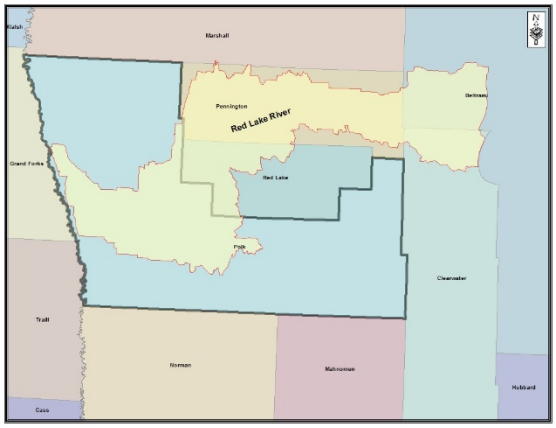
corridor, allowing the Cutoff Ditch to further vegetate and stabilize and restoring the hydrology to the original Grand Marais outlet channel. Project 60F features include a diversion structure, restoration of the original elliptical channel section (Rosgen E6), restoration of the Grand Marais floodplain to a 50 yr. flood event, establishment of native grass wetlands and upland areas within the floodplain, wetland restoration areas, fish passage rock weirs, channel crossing structures allowing for efficient fish passage and hydraulic capacity, controlled side inlet structures, bioengineering channel bank stabilization, and other channel features to enhance habitat and channel stabilization.
Both the Cutoff Ditch and the 6 mile original Grand Marais Outlet channel are functioning in a stable manner and providing efficient fish passage as planned.

This project was funded through the partnership of the Board of Soil and Water Resources RIM (Reinvest in Minnesota) program, USDA-NRCS Continuous Reserve Program and the Red Lake Watershed District. This program allows enrollment of marginal or sensitive agriculture land adjacent to the Grand Marais Creek which outlets into the Red River of the North. The District assists the landowners and the BWSR staff during the application and conservation planning process. A total of 14 RIM (Reinvest in Minnesota) Easements equaling $443,308.00 in payments to private landowners and enrollment of 392.8 RIM easement acres.

Project 60F - http://www.redlakewatershed.org/PDF_Files/Final_Report%2007-20-2012]%20(ID%203789).pdf

Project 60 FF - http://www.redlakewatershed.org/cutchannel.html

Red Lake Watershed



This watershed lies in the west central portion of Polk County and into western portions of Red Lake and Pennington Counties. The Red Lake Watershed totals 1,420 square miles with 480 square miles included in Polk County. The river flows southwesterly through the towns of Thief River Falls, Red Lake Falls, and Crookston before converging with the Red River of the North in East Grand Forks. Polk County communities within this watershed are: Crookston, Fisher, Gentilly, and Mentor.
This river is of great importance for recreation, wildlife habitat and drinking water. The river supports a healthy diversity of fish species as well as retaining a quality vegetative riparian buffer zone in the glacial moraine and glacial moraine-washed tilled plain (beach ridge) physiographic areas of the watershed. It is used as a source for public water supply for the cities of Thief River Falls, East Grand Forks and Grand Forks.

NRCS Rapid Watershed Assessment publication for information
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022515.pdf

In Polk County the watershed lies within the Agassiz Lake Plain to the west with beach ridge areas in the eastern portion. Land use is primarily agricultural production in the Agassiz Lake Plains area with main crops being small grain, sugar beets, corn and soybeans. This area is extensively drained; few wetlands remain in the western portion of the watershed. Land use in the beach ridge area is primarily agricultural consisting of crops, cattle production and temporary restoration (CRP) of native habitat. Sand and gravel mining are significant natural resources that are mined on the beach ridges. Glacial Ridge National Wildlife Refuge, the United States' largest tall grass prairie and wetland restoration project is located in the beach ridge area of the watershed.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters.

The following information is taken from the 1W1P.
The Lower Red Lake River basin includes the Heartsville Coulee, Burnham Creek and Lower Red Lake River minor subwatersheds. The Heartsville Coulee and most of the Burnham Creek watershed areas are dominated by lands in agricultural production. Small patches of woodland and grassland habitat exist near waterways and along the Red Lake River and Red River. Tributaries and ditches in the area provide some seasonal habitat for fish while the lower Red Lake River and Red River provide a diversity of fish and wildlife habitats year round. Many tributaries (natural and ditches) are unstable with large amounts of active erosion
The Lower Red Lake River watershed (generally east of U.S. Highway 9) and eastern portions of the Burnham Creek watersheds have more diverse habitats including agriculture, grasslands, wetlands, brushlands and woodlands. Included in these areas are numerous WMAs, waterfowl protection areas (WPAs).

CRP lands are also common along State Highway 102 (until about 8 miles west of U.S. Highway 9) and in areas along and east of U.S. Highway 9. These lands provide seasonal and permanent habitats to a variety of species including game species such as white-tailed deer, sandhill crane, waterfowl, prairie chicken and sharp-tail grouse. The prairie chicken population has decreased in recent years.

Burnham Creek and Heartsville Coulee provide some seasonal habitat for fish. The Lower Red Lake River provides a diversity of habitats year round. Many tributaries to these streams (natural and ditches) are unstable with large amounts of active erosion. A dam on the Red Lake River at Thief River Falls limits fish passage and the potential for this watershed to produce fish. An important historical lake sturgeon spawning bed is located at the confluence of the Lower Red Lake and Clearwater rivers.

http://www.bwsr.state.mn.us/cleanwaterfund/stories/factsheets/2013/cwa/West%20Polk%20SWCD_Burnham%20Creek%20WSD_CWF13-125_CWA.pdf

The Lower Red Lake River watershed consists of an approximately 874 square mile area. The watershed outlets into the Red River of the North at East Grand Forks, and begins just downstream of the dam in Thief River Falls. The watershed is located mainly within the Red River Valley and Glacial Lake Agassiz/Aspen Parklands ecoregions. Soil textures range from fine in the western portion of the watershed to sandy loam in the east portion of the watershed. There are two sand ridges west of Thief River Falls along what is commonly termed the Pembina Trail. The area consists largely of agricultural land, but is also made up of forest, wetlands, urban and grassland.

This subwatershed is also comprised of two minor subwatersheds which outlet into the Red Lake River. They are the Heartsville
Coulee and Burnham Creek minor subwatersheds. The Heartsville Coulee drains an area of approximately 33 square miles in West Polk County and joins the Red Lake River in East Grand Forks. The Lower Red Lake River subwatershed is bordered along its north side by the Grand Marais subwatershed. The drainage from within the smaller minor subwatersheds ends up in the Red Lake River in the western half of the watershed. The Thief River and Upper Red Lake River subwatersheds are tributaries to the Lower Red Lake River subwatershed in Thief River Falls. The Clearwater River subwatershed is a tributary to the Lower Red Lake River in Red Lake Falls.

There are no lakes in this subwatershed. Wetland areas are scattered throughout the area. These wetland areas are somewhat denser in the extreme southeastern portion of the subwatershed, generally south of U.S. Highway 2 and east of State Highway 102, known as Glacial Ridge. Many of the wetlands in this watershed have been altered by farm drainage for the purpose of agricultural production. Drainage systems in this subwatershed are a complex network of natural streams and legal ditch systems. Generally the ditch systems are under the administration of the county or watershed district in which they reside.
Glacial Ridge is the largest prairie and wetland restoration project in U.S. history. When The Nature Conservancy and its partners initiated the project in 2000, only about 3,000 acres of the more than 24,000 acres purchased by the Conservancy was native prairie; the rest had been used for gravel extraction, crop production and cattle and sheep grazing. The restored grasslands and wetlands provide excellent habitat for prairie nesting birds, threatened prairie plants and wildlife.

The land acquired by the Conservancy forms the core of what is now the Glacial Ridge National Wildlife Refuge, which in time may expand to more than 37,000 acres. The refuge, which is part of the 150-million acre National Wildlife Refuge System, is expected to include more than 8,000 acres of wetlands and about 20,000 acres of tallgrass prairie.

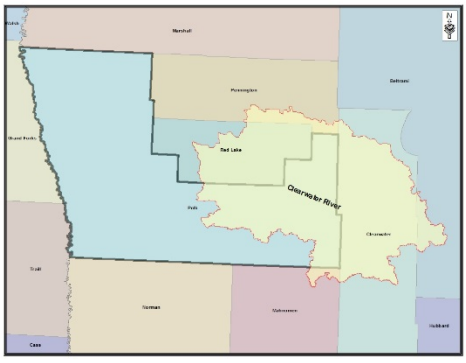
The subwatershed is located in the Lake Plain physiographic area of the RLWD. The surficial geology of the area consists of mainly clay with small regions of silt, sand, sand and gravel ridges and lake-washed till. Clay deposits dominate the Lower Red Lake River subwatershed and are characterized as being very dense, uniform and of low permeability. Thicknesses can range

from a few feet in the eastern part of the watershed to more than 120 feet in the western portions. Nearly level topography in this region also relates to poor drainage. Sand and gravel ridges, known as beach ridges from Glacial Lake Agassiz, occur in mainly north-south trending ridges that range in thickness from a few feet to 30 feet in some areas. Drainage is good within the ridges, but can be poor in the inter-ridge areas where deposits of peat are evident. The fine sand or silt deposits in the area are fairly uniform and are underlain by till and clay. Thicknesses for both deposits are generally less than 20 feet. Lake-washed till deposits are described as sandy, clay-silt loam that contains fine to medium gravel with a scattering of boulders. The deposits are generally not well drained.

Glacial aquifers in the region only provide moderate amounts of groundwater. Suitable yields of 5 gpm, or more for domestic use, are mainly found in sand and gravel deposits in the till. Beach ridge deposits are limited in aerial extent and saturation is limited to a few bottom feet. Groundwater supplies from the smaller beach deposits are unreliable due to periods of limited precipitation. Groundwater supply for industrial use and irrigation is generally poor. Quantities and quality for such uses are inadequate. Hardness of the groundwater is commonly greater than 180 mg/l.

Paleozoic sediments consisting of shales and limestones are discontinuous and underlie the glacial lake deposits along the western side of the subwatershed. The western tip of the subwatershed near East Grand Forks contains Paleozoic limestone and sandstone that is thin and discontinuous. Paleozoic deposits contain highly saline groundwater. Precambrian crystalline rocks underlie most of the subwatershed, forming the base of the groundwater reservoir for most of the watershed. The fractured surface of crystalline rocks may provide an adequate supply of groundwater for limited domestic use.

Clearwater Watershed



The Clearwater Watershed is approximately 1,385 square miles in size with 493 square miles located in the eastern portion of Polk County. The Clearwater River begins in western Clearwater County and flows to the northwest and southwest, eventually emptying into the Red Lake River inRed Lake Falls. Polk County communities within this watershed are: Erskine, Gully, Lengby, McIntosh, and Trail.

In Polk County this watershed contains beach ridge areas in the western portion and moraine areas in the eastern portion. Landforms in this area contain hill and depressional areas. Rydell National Wildlife Refuge is located on the beach ridge prairie to forest transition zone. Polk County land use in this watershed is agricultural production, gravel mining, recreation, forest, and residential/commercial development. Many wetland areas remain throughout the watershed. Calcareous fens exist in this area as do rare and endangered plants.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters.

The following information is taken from the Red Lake Watershed 10 Year Comprehensive Plan. The Clearwater basin includes Upper and Lower Badger Creeks, Clearwater River, Hill River, Lost River and Poplar River minor subwatersheds. The landscapes in these subwatersheds provide a diversity of habitats with farmlands, grasslands, woodlands, wetlands, riparian areas and lakes. Public lands with quality habitats include numerous WMAs, WPAs and Rydell NWR. The majority of these lands are in the beach ridge areas. These include a mix of uplands and wetlands with some woodland areas. These lands provide seasonal and permanent habitats to a variety of species including game species such as white-tailed deer, sandhill crane, waterfowl, prairie chicken and sharp-tail grouse. CRP lands are present throughout the watershed with a concentrated band running east to west generally along the southeast border of Red Lake County (along a beach ridge area). These CRP lands are primarily grasslands. Several wild rice operations also provide some migratory wildlife habitat.

Lakes are prominent and important resources in this watershed. In particular, a number of small lakes are found throughout the southern half of the watershed. These include a mix of fishing and natural environment lakes that provide seasonal and migratory habitat for a variety of species.

Six natural waterways and their tributary networks are also important natural resource features of this watershed. These streams provide a variety of permanent and seasonal habitats for a variety of fish species. The Clearwater River is a trout stream from Clearwater Lake to the west Clearwater county line. The stream is somewhat degraded upstream from this area. From lake to confluence with Ruffy Brook the stream is in good shape. Pasture and woodlands form its corridor. Some wild rice production is present near its confluence with Ruffy Brook and there is an ongoing USACE project in the reach from Ruffy Brook to about five miles east of Plummer.

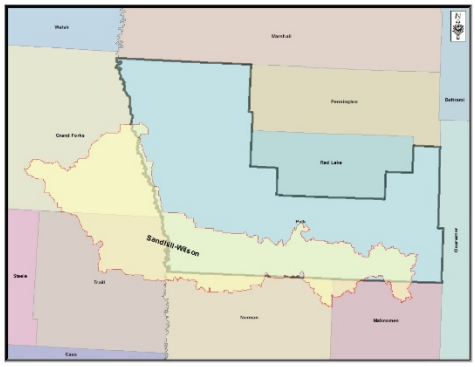
The Poplar River, Hill River, Lost River and Upper and Lower Badger Creek are smaller systems than the Clearwater and primarily provide spawning and rearing habitat for fish. In most areas they have intact corridors that include some pasture areas. Portions of some streams have been dredged in the past but have become naturalized (e.g., Lost River between Oklee and Gully). This subwatershed is also comprised of five smaller subwatersheds which outlet into the Clearwater River. These four subwatersheds include the, Badger Creek, Hill River, Lost River and Poplar River subwatersheds. The Clearwater River subwatershed is bordered along its north side by the Upper Red Lake River subwatershed. All of the drainage from within the smaller subwatersheds ends up in the Clearwater River. All of the water comes together in the Clearwater River and outlets at the confluence with the Red Lake River in Red Lake Falls.

The watershed outlets into the Red Lake River at Sportsman's Park in Red Lake Falls, MN. The Lost, Hill and Poplar rivers are minor tributaries to the Clearwater River. The watershed is located mainly within the Glacial Lake Agassiz/Aspen Parklands and Glacial Moraine ecoregions, but is bordered by the Northern Minnesota Drift and Lake Plains ecoregion. Soil

textures range from loamy-skeletal in the southeastern portion of the watershed to sandy in the west portion of the watershed. The area consists largely of agricultural and forest land, but is also made up of wetland, urban and grassland.

There are many lakes in the Clearwater River subwatershed. There are 28 lakes larger than 100 acres and 107 lakes smaller than 100 acres. Major lakes for recreation include Maple, Cameron, Badger, Clearwater, Pine, Oak, Cross, Turtle, Bradley and Whitefish. The larger lakes typically support a fishery, with the majority of smaller lakes only supporting waterfowl and hunting as a recreation. Much of the shoreline is developed on the larger lakes, and the majority of small lakeshores are undeveloped.
Wetland areas are scattered throughout the area. These wetland areas are considerably denser in the extreme northeastern portion of the subwatershed, especially within the Red Lake Reservation, where the original wetlands are intact. Many of the wetlands have been altered by farm drainage with intent of using for agricultural production.

Sand Hill River Watershed



The Sand Hill River Watershed (SHRWD) lies in the southern portion of Polk County and comprises an area of 483 square miles. Norman and Mahnomen counties comprise the remaining small areas 5 percent and 6.4 percent respectively. The watershed map shows the Sand Hill-Wilson watershed including the North Dakota portion. The total area of the Sand Hill-Wilson watershed is 1,107 square miles.

The Sand Hill River is relatively unbranched as it traverses the district. One notable exception is Kittleson Creek. Kittleson Creek is located in the north central part of the district and joins the Sand Hill River between Fertile and Beltrami. These watercourses consist of an intermingling of natural streams and public and private drainage systems. Most of the land traversed by the Sand Hill River is characterized by low relief and is in agricultural production. The Sand Hill River flows to the west from Sand Hill Lake south of Fosston through Winger, Fertile, Beltrami and Nielsville to the confluence with the Red River of the North near Climax. .

https://www.pca.state.mn.us/water/watersheds/red-river-north-sand-hill-river

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_021584.pdf

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/mn/technical/?cid=nrcs142p2_023632

http://mrbdc.mnsu.edu/mnnutrients/watersheds/red-river-north-sandhill-river

Other watersheds bordering the SHRWD are the Wild Rice River (south and east), and Red Lake River (north and east). The western boundary is the Red River of the North. Polk County

communities within this watershed are Beltrami, Climax, Fertile, Fosston, Nielsville, and Winger.

In Polk County the watershed lies within the Agassiz Lake Plain to the west with beach ridge area of the watershed in the south/central portions and moraines to the east. Land use is primarily agricultural production in the Agassiz Lake Plain area and is extensively drained. Very few wetlands remain in the western portion of the watershed. Wetlands are common in the glacial moraine region as well as in low areas between the beach ridges. There are many small lakes within the north-central portion of the SHRWD between Fertile and Winger. All of the lakes are in Polk County. Most of these lakes tend to be closed basins or have poorly developed outlets. Union and Sarah Lakes are the largest and most heavily developed in the District. Cable, Sand Hill, Union and Sarah Lakes are considered Recreational Development Lakes on the DNR Protected Waters Inventory. Kittleson Lake is also a recreationally important lake in the District.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters.

The following information is taken from the Sand Hill Watershed District Watershed Management Plan (Approved January 2012). The geology of the Red River Basin and the SHRWD, as a microcosm, consist of glacial lake deposits, lakeshore deposits, till and a small amount of ice contact deposits overlying the bedrock. Bedrock in the east part of the basin consists of Precambrian, undifferentiated igneous, and metamorphic rock. Bedrock in the west part of the basin consists of a small band of Cretaceous, fine grained sandstone and shell. Clay and silt lake deposits dominate the Lake Agassiz plain bordering the Red River of the North. A transition zone between the lake plain and the glacial moraine areas is formed by lakeshore deposits, delta sand, and gravel.

Species of wildlife hunted in the area include whitetail deer, waterfowl, pheasants, and ruffed grouse. The hunting of waterfowl is attractive because many ducks and geese are produced locally in the SHRWD's numerous prairie potholes, and the watershed lies in the path of the Mississippi flyway. Geese, mallards, wood ducks, and blue-winged teal are most common in the pothole area.

The primary watercourse within the District is the Sand Hill River. A number of tributaries with differing channel size, slope and drainage area join the Sand Hill River as it flows west toward the Red River of the North. Kittleson Creek outlets into the Sand Hill River in the north central portion of the District. Very few additional discrete tributaries join the Sand Hill River within the western part of the District, rather, legal drainage systems serving agricultural land outlet into the Sand Hill River in the extreme western portion of the District.

The parent material for the soils in the western portion of the District is comprised of lacustrine sediments formed by glacial Lake Agassiz. Typical soils in this area vary from fine-silty clays along the western edge to very fine clay. In the central portion of the District soils range from

clay loams and sandy loams mixed with sands and gravels. Soils in the eastern portion of the region consist of rolling and hilly areas of dark colored medium texture soils characterized as fine-loamy.

II. Priority Concern Assessments

Priority Concern 1: Surface Water Quality

A) The Polk County Local Water Management Plan will focus on protection and enhancement of surface water quality. Specific areas of focus will be:

- Lake Region in the eastern part of the county, with specific focus on the human impacts.
    - Increases in development around smaller, non-recreational lakes and larger wetland complexes should be assessed to determine if adverse impacts have affected the water quality of these smaller bodies of water.
    - For nearly all of the lakes in this ecoregion phosphorus is the limiting factor. Major management efforts related to water quality are directed at limiting the amount of phosphorus loading into the lakes.
    - Sediment loading has also become a major concern to the water quality of the lakes. Proper land use management and implementation of Best Management Practices needs to be analyzed and addressed.

The Lakes region of the County has a direct impact on the economy of not only the county but the region. Lakes in this region are used for recreation, including boating, fishing, waterfowl hunting, swimming, and camping. They are used by permanent residents, summer home residents, and tourists who are attracted to this area from all over the United States and Canada. Public access and campgrounds are available for public use on many lakes. Many year-round residences and summer residences have been built in part because of the recreational and aesthetic appeal of the area. Fishing is popular in these lakes. Common fish found in these waters include bass, northern pike, and pan fish. To maintain this it is vitally important to have good water quality in and around the Counties lakes. That is why the County has identified this specific area so that these valuable natural resources may be preserved.

Lake Water Quality Data

The Minnesota Department of Natural Resources Lake Water Quality Data Summary for lakes in Polk County indicates that lakes are categorized by trophic status. Trophic status is the level of growth or productivity of a lake as measured by phosphorus content, algae abundance, and depth of light penetration. Eutrophic lakes are defined as nutrient rich lakes, usually shallow, “green” and with limited oxygen in the bottom layer of water. Mesotrophic lakes are defined as midway in nutrient levels between the eutrophic and oligotrophic lakes. Oligotrophic lakes are relatively nutrient poor, clear and deep with bottom waters high in dissolved oxygen. No lakes in Polk County are considered oligotrophic. The Minnesota Department of Natural Resources Lake finder website offers information on 60 lakes in Polk County. Lake information, maps, water

levels, water quality, topography and more can be found at: www.dnr.state.mn.us/lakefind/index.html .

MN DNR Lake Water Quality

Waterbody	Trophic Status
Badger	Mesotrophic
Breeze	Mesotrophic
Cable	Eutrophic
Cameron	Eutrophic
Hill River	Eutrophic
Maple	Eutrophic
Poplar	Eutrophic
Sand Hill	Mesotrophic
Sarah	Eutrophic
Store	Eutrophic
Turtle	Eutrophic
Union	Mesotrophic
Whitefish	Eutrophic

Sand Hill River Watershed

The following information is taken from the Sand Hill River Watershed District Management Plan. In the mid 1990's, the MPCA evaluated the ability of lakes within the Sand Hill River Watershed to meet the goal of being swimmable and aesthetically pleasing. The MPCA based the assessment primarily on the trophic status of lakes with the Sand Hill River Watershed through the use of actual lake water quality data. This analysis showed "good" water quality for Union, Sarah, Cable, and Sand. This determination of good water quality was based on comparison to other similar lakes within the ecoregion.

Increased demands on these water bodies, however, also leads to a risk of water quality degradation. While there are varying degrees of reduced water quality, impacts can already be seen on some of the SHRWD lakes. Twenty-four lakes in the Sand Hill River Watershed District have been identified as priority lakes for management. More information on the SHRWD lake management framework can be found in the Sand Hill River Watershed District Watershed Management Plan (January 2012).

General Characteristics of Lakes in the Sand Hill River Watershed District

Lake Name	ID	Lake Area	Quality	Sensitivity to Disturbance
LaDuc	03030400	101	high	Moderate
Ketchum	03064800	170	high	Moderate
Frethem	03064600	65	marginal	High
Allen	03031300	156	high	Moderate
Eastland	03065900	41	high	Moderate
Simonson	03065700	137	high	Moderate
Sand Hill	14009900	598	marginal	High
Labrie	14002100	193	high	Moderate
Hilligas	14001900	130	marginal	High
Strand	03061900	28	impaired	High
Clydes	03029200	47	moderate	Moderate
Newton	03052800	46	moderate	High
Matson	03030200	42	moderate	Moderate
Union	03052600	910	moderate	Moderate
Sarah	60020200	43		
Bungum	03029300	67	moderate	Moderate
Halverson	03043000	161	moderate	Moderate
Maltrod	03024100	20	moderate	Moderate
Rindahl	14008900	54	moderate	High
Cable	14003000	82	moderate	Moderate
Arthur	14010000	123	moderate	Moderate
Lundby	14007800	33	moderate	Moderate
Kittleson	03035200	304	moderate	Low
Chicog	03057900	113	moderate	Low

Fisheries in Polk County

The Minnesota Department of Natural Resources fisheries managers stock walleyes in several Polk County lakes. Stocking levels are adjusted up and down as necessary. The goal of these manipulations is to find appropriate stocking levels that increase or maintain healthy walleye populations. The following chart shows fish stocking rates for the previous three years. More information on fish stocking can be found on the MN DNR website: www.**dnr**.state.**mn**.us **MN DNR Stocking Rates in Polk County**

Lake	Year	Species	Fry	Fingerling	Yearling	Adult	Total LBS
Badger	2016	Walleye	260,000				2.2
Erskine Kid's Pond	2016	Bluegill Sunfish	0	0	0	900	300
Maple	2016	Walleye	0	15,372	1,864	511	1,576
Red Lake River	2016	Lake Sturgeon	114,090				4.5
Sarah	2016	Walleye	230,000	0	0	0	2.0
Spring	2016	Walleye	0	900	0	0	45
Union	2016	Walleye	591,000	0	0	0	5.1
Badger	2015	Walleye	260,000				2.3
Cross	2015	Walleye	303,000	0	0	0	2.7
Erskine Kid's Pond	2015	Bluegill Sunfish	0	0	0	660	220
Hill River	2015	Walleye	67000	0	0	0	0.6
Maple	2015	Walleye	0	6,121	14,837	13	1,576
Red Lake River	2015	Lake Sturgeon	100,000				4.0
Store	2015	Walleye	50,000	0	0	0	0.5
Whitefish	2015	Walleye	183,000	0	0	0	1.6
Badger	2014	Walleye	260,000				2.3
Erskine Kid's Pond	2014	Bluegill Sunfish	0	0	0	1,860	310
Maple	2014	Walleye	0	964	31,545	24	1,576
Red Lake River	2014	Lake Sturgeon	58,000				3.6
Sarah	2014	Walleye	180,000				1.6
Spring	2014	Walleye	0	1,056	0	0	44
Union	2014	Walleye	591,000	0	0	0	5.2

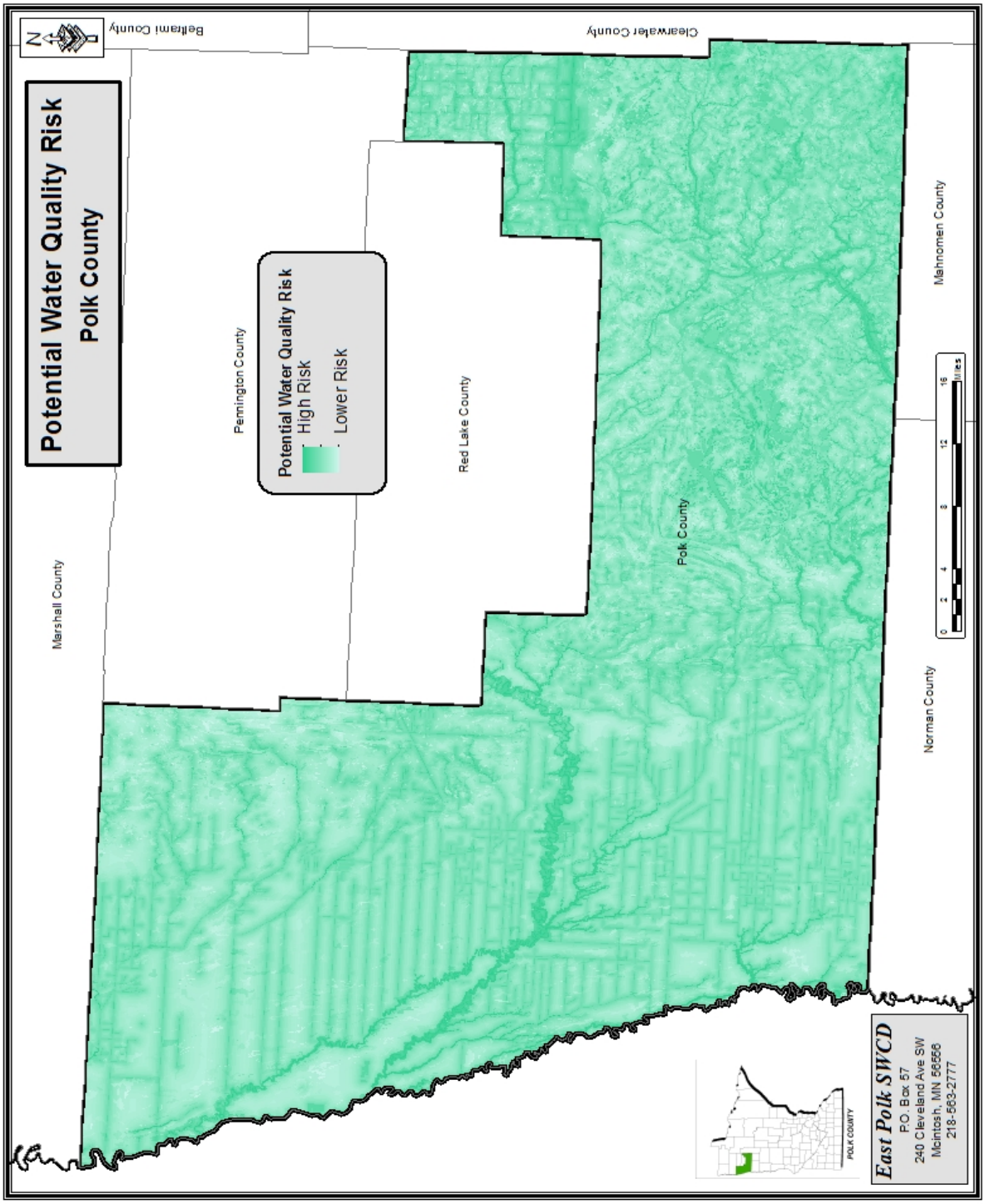
Shoreland Development

The Annual Shoreland Report from the Polk County Planning & Zoning Administrator reports

115 Shoreland permits were approved in 2016. In 2015, 89Shoreland Permits were granted and in 2014 the number of shoreland permits approved was 97. The 2013 list data for shoreland permits located within shoreland area (1000 feet lakes/ 300 feet rivers) reports 64 permits granted. This data indicates an increasing pattern of shoreland development around the lakes in Polk County. Development pressure has been increasing steadily on Natural Environment lakes, posing potential concerns of water quality risks. There is a need to determine what and how much this increased development impacts these smaller basins.

Potential Water Quality Risk in Polk County

The following map will be used to estimate areas of potential water quality risk in Polk County.



B) Surface water supplies in the western part of the county.

o The cities of East Grand Forks and Grand Forks receives their public water supply from the Red Lake River. East Grand Forks City Municipal Waterworks are permitted the use of 700 MGY/ 5,600 GPM for domestic water supply, while Grand Forks City Municipal Waterworks is permitted to use 3500 MGY/13900 GMP for their water supply.

- The Red Lake River is impaired for turbidity and management efforts should focus on sediment loading into the Red Lake River and its tributaries.

The City of East Grand Forks obtains its drinking water exclusively from the Red Lake River. The City of Grand Forks, North Dakota, also uses the Red Lake River as a drinking water source. The MDH tests all public water supply systems for a variety of constituents. The testing is completed on "finished" water after any treatment processes. Large industries, such as power generating plants, sugar and potato processing plants rely on rivers for their water supply. It is necessary to filter and disinfect all river water used for municipal and industrial purposes. During high spring run-off, water purification problems are increased. Naturally occurring organics, sediment, micro-organisms, and turbidity are the most common issues.

Permittee	Use Name	Resource Name	Permit Volume (MGY)	Permit GPM	Use 2016 (MGY)
GRAND FORKS, CITY OF	Municipal Waterworks	Red Lake River	3,500	13,900	481,194,000
EAST GRAND FORKS	Municipal Waterworks	Red Lake River	700	5,600	361,502,000

City of East Grand Forks Source Water Assessment

The 1996 Amendments to the federal Safe Drinking Water Act (SDWA) require the Minnesota Department of Health (MDH) to complete source water assessments for public water systems. The contaminants of concern are the contaminants regulated under the federal SDWA. They are divided into organic chemicals, inorganic chemicals, radionuclides, and microorganisms. A listing can be found at: *http://www.epa.gov/safewater*. Of greatest concern are naturally occurring organics, sediment, free ammonia, microorganisms, and turbidity. The cities of East Grand Forks and Grand Forks have also identified pharmaceuticals and endocrine disrupting chemicals as emerging issues. These types of potential contaminants are not well understood at this time.

http://www.egf.mn/DocumentCenter/View/3913

Typical draw from the river by the East Grand Forks Water and Light Department is 1.3-1.5 million gallons per day with the plant rated to a 4 million gallon per day capacity. Typical draw for the Grand Forks system is 8 million gallons per day (76 percent from the Red Lake River and 24 percent from the Red River) with the facility rated to a maximum volume of 16.5 million gallons per day. Because of an interconnection, the cities have the ability to transfer approximately 2 million gallons of finished water per day between the two systems. The current agreement allows either mayor to request water from the other in an emergency. River flow averages 918 million gallons per day.

Water Use in Polk County

Water use in Polk County as determined by United States Geological Survey provides estimates of public supply deliveries for domestic use. The population of Polk County served by a public supply of groundwater or surface water is 14,437. The domestic, self supplied population utilizing groundwater withdrawals and deliveries from public supply totals 8,927 residents. Polk County estimates the following public supply population served by ground water and surface water.

Estimated Domestic Supply Water Use In Polk County in 2010, USGS

Total Population Served By Groundwater	Total Population Served by Surface water	Self Supplied Population	Total Population of County
12,080	7,910	11,610	31,600

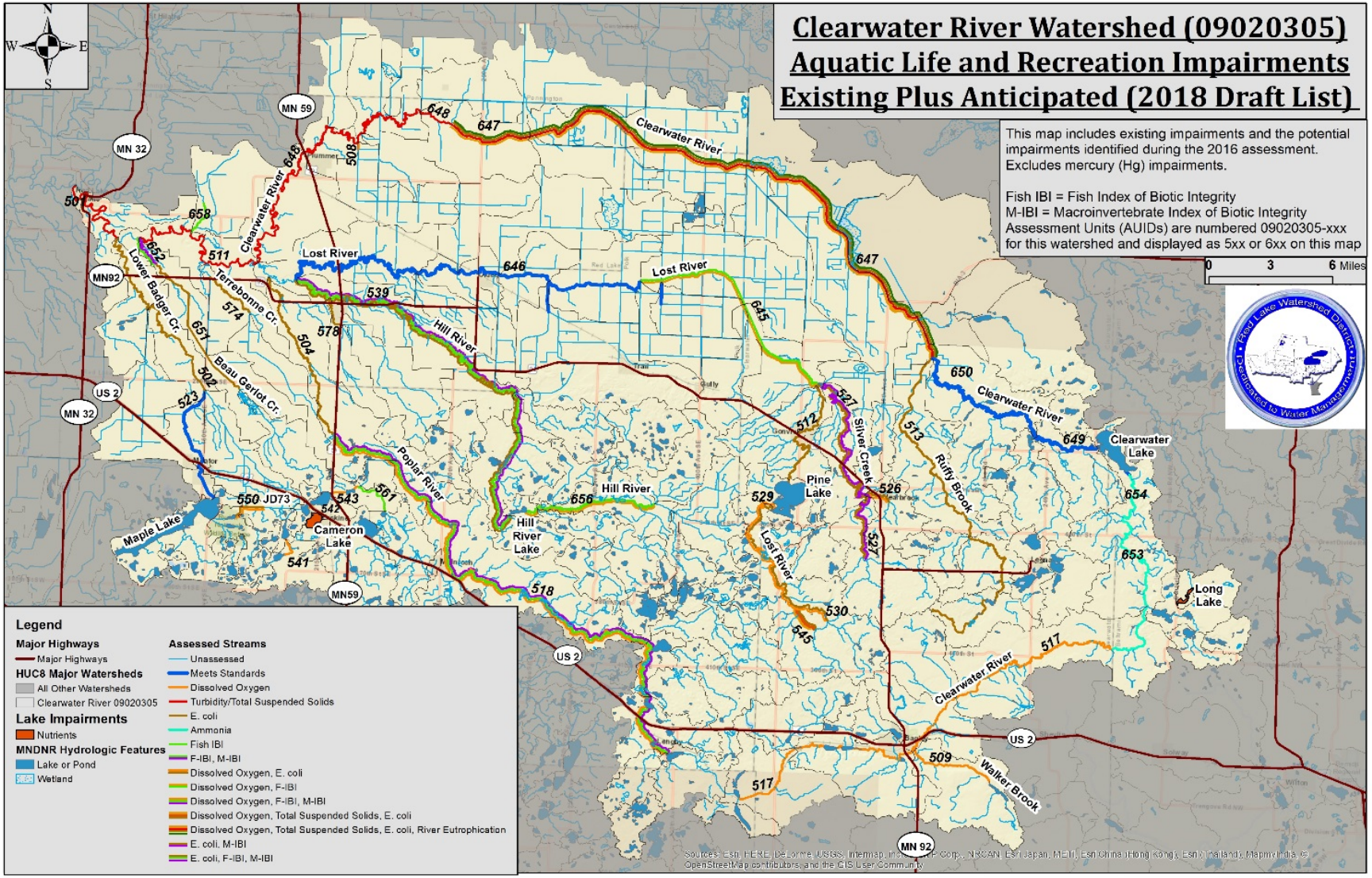
USGS estimates that the total groundwater withdrawals in Polk County are 2.43 Millions of gallons per day (Mgal/d). The total surface water withdrawals total 10.70 Mgal/d. Below are several estimates of water demand by use. Other uses not included on the chart below but contribute to the total demand are aquaculture, irrigation, mining, and livestock use.

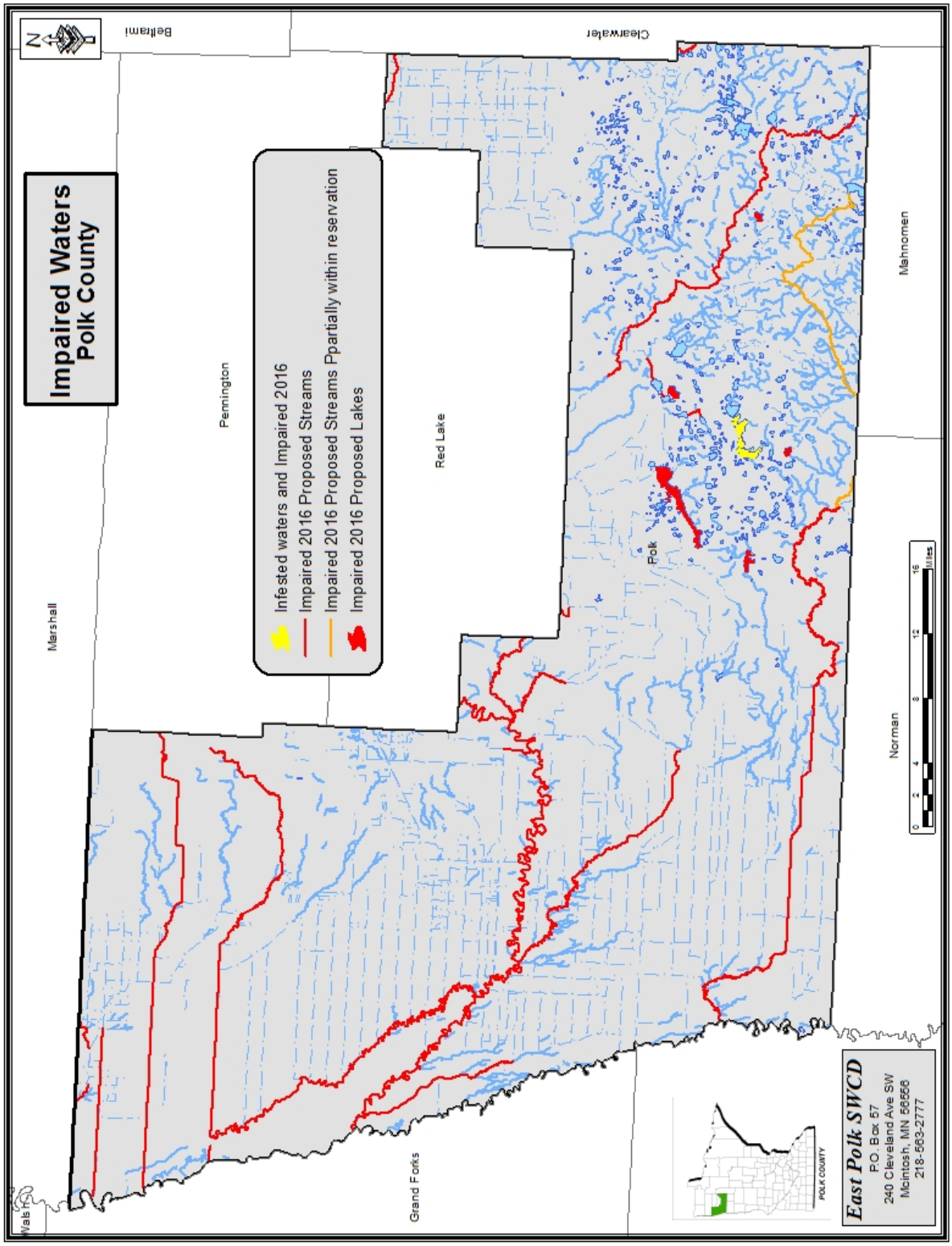
Water Withdrawn for use in Polk County in Millions of Gallons per day
USGS Data, 2010

Source of Withdrawal	**Public Supply** Ground - water	**Public Supply** surfacewater	**Domestic** groundwater	**Domestic** Delivery from Public Supply	**Industrial** Groundwater	**Industrial** Surfacewater	**Irrigation (5,100 Acres)**
Mgal/d	0.88	7.06	0.81	1.06	0.08	0.01	3.54

Impaired Waters and Total Maximum Daily Loads

The MPCA is the state agency responsible for protecting Minnesota's water quality. Every two years an updated list of impaired streams and lakes is published. This list can be found on the MPCA Website at www.pca.state.mn.us/water/tmdl/index.html. The Clean Water Act requires the Minnesota Pollution Control Agency (MPCA) to identify and restore impaired waters.


Clearwater River Watershed (09020305)
Aquatic Life and Recreation Impairments
Existing Plus Anticipated (2018 Draft List)
This map includes existing impairments and the potential impairments identified during the 2016 assessment. Excludes mercury (Hg) impairments.
Fish IBI = Fish Index of Biotic Integrity
M-IBI = Macroinvertebrate Index of Biotic Integrity
Assessment Units (AUIDs) are numbered 09020305-xxx for this watershed and displayed as 5xx or 6xx on this map
0 3 6 Miles
Legend
Major Highways
Major Highways
HUC8 Major Watersheds
All Other Watersheds
Clearwater River 09020305
Lake Impairments
Nutrients
MNDNR Hydrologic Features
Lake or Pond
Wetland
Assessed Streams
Unassessed
Meets Standards
Dissolved Oxygen
Turbidity/Total Suspended Solids
E. coli
Ammonia
Fish IBI
F-IBI, M-IBI
Dissolved Oxygen, E. coli
Dissolved Oxygen, F-IBI
Dissolved Oxygen, F-IBI, M-IBI
Dissolved Oxygen, Total Suspended Solids, E. coli
Dissolved Oxygen, Total Suspended Solids, E. coli, River Eutrophication
E. coli, M-IBI
E. coli, F-IBI, M-IBI
Clearwater River
Lost River
Hill River
Beau Gerlot Cr.
Lower Badger Cr.
Terrebonne Cr.
Poplar River
Silver Creek
Ruffy Brook
Walker Brook
Maple Lake
Cameron Lake
Hill River Lake
Pine Lake
Clearwater Lake
Long Lake
MN 59
MN 32
MN92
US 2
MN59
MN 92
Red Lake Watershed District
Dedicated to Water Management


Impaired Waters
Polk County
Infested waters and Impaired 2016
Impaired 2016 Proposed Streams
Impaired 2016 Proposed Streams Ppartially within reservation
Impaired 2016 Proposed Lakes
Beltrami
Clearwater
Mahnomen
Pennington
Red Lake
Polk
Norman
Marshall
Grand Forks
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
McIntosh, MN 56556
218-563-2777

Polk County 2016 Impaired Rivers and Lakes

Water body name	Water body description	Year added to List	Watershed name	Pollutant or stressor	Affected designated use
Cameron	Lake or Reservoir	2008	Clearwater River	Nutrient/eutrophication biological indicators	Aquatic Recreation
Maple	Lake or Reservoir	1998	Clearwater River	Mercury in fish tissue	Aquatic Consumption
Poplar River	Spring Lk to Highway 59	2002	Clearwater River	Dissolved oxygen	Aquatic Life
Poplar River Diversion	Unnamed ditch to Badger Lk	2006	Clearwater River	Dissolved oxygen	Aquatic Life
Unnamed creek	Eighteen Lk to Bee Lk	2006	Clearwater River	Dissolved oxygen	Aquatic Life
Unnamed creek	Mitchell Lk to Badger Lk	2006	Clearwater River	Dissolved oxygen	Aquatic Life
Burnham Creek	CD 106 to Polk CD 15	2016	Red Lake River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Burnham Creek	CD 106 to Polk CD 15	2016	Red Lake River	Fishes bioassessments	Aquatic Life
Burnham Creek	Polk CD 15 to Red Lake R	2016	Red Lake River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Burnham Creek	Polk CD 15 to Red Lake R	2016	Red Lake River	Fishes bioassessments	Aquatic Life
Gentilly River	CD 140 to Red Lake R	2016	Red Lake River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Gentilly River	CD 140 to Red Lake R	2016	Red Lake River	Escherichia coli	Aquatic Recreation
Gentilly River	CD 140 to Red Lake R	2016	Red Lake River	Fishes bioassessments	Aquatic Life
Judicial Ditch 60	Lateral DItch 4 to Red Lake R	2016	Red Lake River	Dissolved oxygen	Aquatic Life
Kripple Creek	Unnamed cr to Gentilly R	2016	Red Lake River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Kripple Creek	Unnamed cr to Gentilly R	2016	Red Lake River	Escherichia coli	Aquatic Recreation
Kripple Creek	Unnamed cr to Gentilly R	2016	Red Lake River	Fishes bioassessments	Aquatic Life
Red Lake River	Burnham Cr to Unnamed cr	1998	Red Lake River	Mercury in fish tissue	Aquatic Consumption
Red Lake River	Burnham Cr to Unnamed cr	1998	Red Lake River	Turbidity	Aquatic Life
Red Lake River	County Ditch 99 to Burnham Cr	1998	Red Lake River	Mercury in fish tissue	Aquatic Consumption

Water body name	Water body description	Year added to List	Watershed name	Pollutant or stressor	Affected designated use
Red Lake River	County Ditch 99 to Burnham Cr	2008	Red Lake River	Turbidity	Aquatic Life
Red Lake River	Gentilly R to County Ditch 99	1998	Red Lake River	Mercury in fish tissue	Aquatic Consumption
Red Lake River	Gentilly R to County Ditch 99	2008	Red Lake River	Turbidity	Aquatic Life
Red Lake River	Unnamed cr to Red R	1998	Red Lake River	Mercury in fish tissue	Aquatic Consumption
Red Lake River	Unnamed cr to Red R	2002	Red Lake River	Turbidity	Aquatic Life
Unnamed creek	CD 115 to Red Lake R	2016	Red Lake River	Dissolved oxygen	Aquatic Life
County Ditch 2	CD 66 to Grand Marais Cr	2016	Red River of the North - Grand Marais Creek	Aquatic macroinvertebrate bioassessments	Aquatic Life
County Ditch 2	CD 66 to Grand Marais Cr	2016	Red River of the North - Grand Marais Creek	Escherichia coli	Aquatic Recreation
County Ditch 2	CD 66 to Grand Marais Cr	2016	Red River of the North - Grand Marais Creek	Fishes bioassessments	Aquatic Life
County Ditch 43 (Judicial Ditch 75)	Unnamed ditch to CD 7	2016	Red River of the North - Grand Marais Creek	Aquatic macroinvertebrate bioassessments	Aquatic Life
County Ditch 43 (Judicial Ditch 75)	Unnamed ditch to CD 7	2016	Red River of the North - Grand Marais Creek	Fishes bioassessments	Aquatic Life
Grand Marais Creek	Headwaters to CD 2	2006	Red River of the North - Grand Marais Creek	Dissolved oxygen	Aquatic Life
Grand Marais Creek	Headwaters to CD 2	2006	Red River of the North - Grand Marais Creek	Turbidity	Aquatic Life
Grand Marais Cutoff Channel	Grand Marais Cr to Red R	2016	Red River of the North - Grand Marais Creek	Chlorpyrifos	Aquatic Life
Judicial Ditch 1	County Ditch 7 to Red River	2016	Red River of the North - Grand Marais Creek	Escherichia coli	Aquatic Recreation
Judicial Ditch 75	County Ditch 7 to Red River	2016	Red River of the North - Grand Marais Creek	Escherichia coli	Aquatic Recreation
Judicial Ditch 75	County Ditch 7 to Red River	2016	Red River of the North - Grand Marais Creek	Fishes bioassessments	Aquatic Life
Red River of the North	English Coulee (ND) to Grand Marais Cr	1998	Red River of the North - Grand Marais Creek	Mercury in fish tissue	Aquatic Consumption
Red River of the North	English Coulee (ND) to Grand Marais Cr	1998	Red River of the North - Grand Marais Creek	PCB in fish tissue	Aquatic Consumption
Unnamed creek (Red Lake Watershed Ditch 15)	Headwaters to CD 66	2016	Red River of the North - Grand Marais Creek	Dissolved oxygen	Aquatic Life

Water body name	Water body description	Year added to List	Watershed name	Pollutant or stressor	Affected designated use
County Ditch 17	Garden Slough to Sand Hill R	2014	Red River of the North - Sandhill River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Kittleson	Lake or Reservoir	2014	Red River of the North - Sandhill River	Nutrient/eutrophication biological indicators	Aquatic Recreation
Red River of the North	Buffalo Coulee (ND) to Cole Cr (ND)	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Buffalo Coulee (ND) to Cole Cr (ND)	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Cole Cr (ND) to Red Lake R	2008	Red River of the North - Sandhill River	Arsenic	Aquatic Consumption
Red River of the North	Cole Cr (ND) to Red Lake R	2010	Red River of the North - Sandhill River	Dissolved oxygen	Aquatic Life
Red River of the North	Cole Cr (ND) to Red Lake R	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Cole Cr (ND) to Red Lake R	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Cole Cr (ND) to Red Lake R	1996	Red River of the North - Sandhill River	Turbidity	Aquatic Life
Red River of the North	Grand Forks Dam to English Coulee (ND)	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Grand Forks Dam to English Coulee (ND)	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Marsh R to Sand Hill R	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Marsh R to Sand Hill R	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Red Lake R to Grand Forks Dam	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Red Lake R to Grand Forks Dam	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Red Lake R to Grand Forks Dam	2008	Red River of the North - Sandhill River	Turbidity	Aquatic Life
Red River of the North	Sand Hill R to Buffalo Coulee (ND)	1998	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Red River of the North	Sand Hill R to Buffalo Coulee (ND)	1998	Red River of the North - Sandhill River	PCB in fish tissue	Aquatic Consumption
Red River of the North	Sand Hill R to Buffalo Coulee (ND)	2008	Red River of the North - Sandhill River	Turbidity	Aquatic Life
Sand Hill River	CD 17 to Kittleson Cr	2014	Red River of the North - Sandhill River	Escherichia coli	Aquatic Recreation

Water body name	Water body description	Year added to List	Watershed name	Pollutant or stressor	Affected designated use
Sand Hill River	CD 17 to Kittleson Cr	2014	Red River of the North - Sandhill River	Fishes bioassessments	Aquatic Life
Sand Hill River	Headwaters to CD 17	2014	Red River of the North - Sandhill River	Aquatic macroinvertebrate bioassessments	Aquatic Life
Sand Hill River	Headwaters to CD 17	2008	Red River of the North - Sandhill River	Dissolved oxygen	Aquatic Life
Sand Hill River	Headwaters to CD 17	2014	Red River of the North - Sandhill River	Escherichia coli	Aquatic Recreation
Sand Hill River	Headwaters to CD 17	2014	Red River of the North - Sandhill River	Fishes bioassessments	Aquatic Life
Sand Hill River	Headwaters to CD 17	2010	Red River of the North - Sandhill River	Turbidity	Aquatic Life
Sand Hill River	Kittleson Cr to Unnamed cr	2014	Red River of the North - Sandhill River	Escherichia coli	Aquatic Recreation
Sand Hill River	Kittleson Cr to Unnamed cr	2014	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Sand Hill River	Unnamed cr to Red R	2014	Red River of the North - Sandhill River	Escherichia coli	Aquatic Recreation
Sand Hill River	Unnamed cr to Red R	2014	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Sand Hill River	Unnamed cr to Red R	2010	Red River of the North - Sandhill River	Turbidity	Aquatic Life
Uff	Lake or Reservoir	2014	Red River of the North - Sandhill River	Nutrient/eutrophication biological indicators	Aquatic Recreation
Union	Lake or Reservoir	2014	Red River of the North - Sandhill River	Mercury in fish tissue	Aquatic Consumption
Unnamed	Lake or Reservoir	2014	Red River of the North - Sandhill River	Nutrient/eutrophication biological indicators	Aquatic Recreation

- WRAPS status:
  - Red Lake River: Draft TMDL and WRAPS documents were completed at the end of 2016. Currently, those drafts are being edited in preparation for EPA review and public comment. The MPCA has released Watershed Monitoring and Assessment and Stressor Identification Reports for the watershed.
    - Monitoring and Assessment Report: https://www.pca.state.mn.us/sites/default/files/wq-ws3-09020303b.pdf
    - Stressor Identification Report: https://www.pca.state.mn.us/sites/default/files/wq-ws5-09020303a.pdf
    - Most recent draft of the WRAPS: Http://www.redlakewatershed.org/waterquality/Temp_Share/Red%20Lake%20River%20WRAPS%20Draft%20-%20December%202016.docx

        - Most recent draft of the TMDL: www.redlakewatershed.org/waterquality/Temp_Share/Red%20Lake%20River%20Watershed%20TMDL%20Dec16.docx
    - Grand Marais Creek: Draft TMDL and WRAPS documents have been completed, but have not proceeded to public comment yet. The MPCA has released Watershed Monitoring and Assessment and Stressor Identification Reports for the watershed.
        - Monitoring and Assessment Report: https://www.pca.state.mn.us/sites/default/files/wq-ws3-09020306b.pdf
        - Stressor Identification Report: https://www.pca.state.mn.us/sites/default/files/wq-ws5-09020306a.pdf
        - Draft TMDL: https://www.pca.state.mn.us/sites/default/files/wq-iw5-13b.pdf
    - Clearwater River: The RLWD is in the process of writing draft Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategy (WRAPS) reports. The MPCA has not made stressor identification or monitoring and assessment reports for this watershed public yet. A draft stressor identification report has been written, though.
    - Sand Hill River: Draft TMDL and WRAPS documents have been completed and are available online, as well as the monitoring and assessment report and stressor identification report for the watershed.
        - Sand Hill River Monitoring and Assessment Report: https://www.pca.state.mn.us/sites/default/files/wq-ws3-09020301b.pdf
        - Sand Hill River Stressor Identification Report: https://www.pca.state.mn.us/sites/default/files/wq-ws5-09020301.pdf
        - Sand Hill River Watershed TMDL: https://www.pca.state.mn.us/sites/default/files/wq-iw5-10e.pdf
        - Sand Hill River Watershed Restoration and Protection Strategy: https://www.pca.state.mn.us/sites/default/files/wq-ws4-26a.pdf

C) In addition to the above mentioned specific areas of concern for Polk County, The County Board, Watershed Districts and SWCDs will actively pursue efforts to address surface quality concerns within the County.

Grand Marias Creek Watershed

Refer to the One Watershed, One Plan (1W1P).

Lower Red Lake Watershed

Refer to the One Watershed One Plan (1W1P).

Clearwater River Watershed

The MPCA has identified the Clearwater River as an impaired water body due to high levels of turbidity, TSS, fecal coliforms (E. coli) and low dissolved oxygen during periods of low flow. Water quality monitoring has been done by the RLWD at 19 sites associated with streams since 1984. The parameters measured included field measurements for dissolved oxygen, pH, temperature, turbidity, transparency and conductivity. Laboratory analysis is performed on stream samples for fecal coliform (E. coli), orthophosphorus, nitrates and nitrites, ammonia, total Kjeldahl nitrogen and alkalinity. The RLWD periodically prepares a water quality report. Results are available upon request in the RLWD office.

The RLWD also sponsors River Watch programs for nine schools. The goals of the program are to develop baseline water quality data, provide hands on "real world" science opportunities for students and promote greater citizen awareness and understanding of watersheds and the role of watershed districts. Senior high students from participating schools perform the monitoring, including field collection and lab analysis. Field measurements of dissolved oxygen, water temperature, pH, conductivity, transparency, turbidity, stage, water depth and stream width are collected at each site along with appearance and recreational suitability observations. Each school collects data at least once per month. River Watch groups prepare reports based upon monitoring results. These reports are then presented at area River Watch forums. The RLWD staff work directly with Win-E-Mac Public School with data collection activities.

The watershed will continue to assess the problem and the data available for the next 303D assessment. It is the RLWD's goal to address the following issues with the Clearwater River subwatershed.

- Turbidity, TSS, fecal coliform and low dissolved oxygen 303D impairment.
- Potential impacts of TMDLs on wild rice operations.
- Maple Lake water quality.

Erosion due to storm runoff is another serious problem in the subwatershed. During periods of high runoff, channel erosion causes bank stabilization concerns for this subwatershed. The severity depends on the land cover, duration and volume of water. Erosion is often worse in the spring due to the lack of vegetative cover on the fields. It is the RLWD's goal to address the following issues with the Clearwater River subwatershed:

- Tributary bank instability at the outlets into the river.
- Lost River channel and streambank erosion.
- Ditches outletting into natural streams and contributing sediment.

Sand Hill River Watershed

This assessment has been taken from the Sand Hill river Watershed District Management Plan. The Minnesota Pollution Control Agency is continually updating their list of impaired water bodies in the State of Minnesota, as required by the U.S. Environmental Pollution Agency. There are some bodies within the Sand Hill Watershed that are listed as being impaired. The main stressor for the riverine impairment is due to turbidity and the excessive sediment being carried by these waterways.

https://www.pca.state.mn.us/water/watersheds/red-river-north-sand-hill-river

The SHRWD has contracted with Houston Engineering to conduct a multi-parameter, watershed wide TMDL Study and develop the Restoration and Protection Plans.
The goals of the plans are to provide protection where conditions meet standards and restoration where conditions are impaired. The plans are intended to supplement the SHRWD 10 year plan, and eventually will become a chapter, identifying water quality management activities in the watershed. The plans will also identify the roles of the state and local resource management organizations within the watershed.

The Watershed Approach applies to the Total Maximum Daily Load (TMDL) Study system for impaired waters, to the watershed as a whole. In addition to the reach- by- reach or lake-by –lake method used to restore impaired waters, the Watershed Approach assesses complaint water bodies for their likelihood to become impaired or possibly contribute to impairments further downstream in the watershed. The goals of the Watershed Approach are to use the TMDL Study system to conduct a multi-parameter, watershed –wide assessment of the watershed and develop and implement restoration plans for the impaired waters and protection plans for the complaint waters that will guide surface water quality management throughout the watershed.

Erosion and sediment is a serious water quality issue throughout the SHRW's river and tributaries. Excessive erosion occurs in the beach ridge area where the land naturally has excessive slopes and the soils light and erodible from water and wind. In the lake plain area of the SHRW, agricultural activities contribute to erosion susceptibility.

Top issues in the Sand Hill River Watershed area:

- Flood damage reduction, rate of runoff and volume of
- runoff
- Agricultural drainage
- Water quality
- Erosion and sediment control, Flood plain management

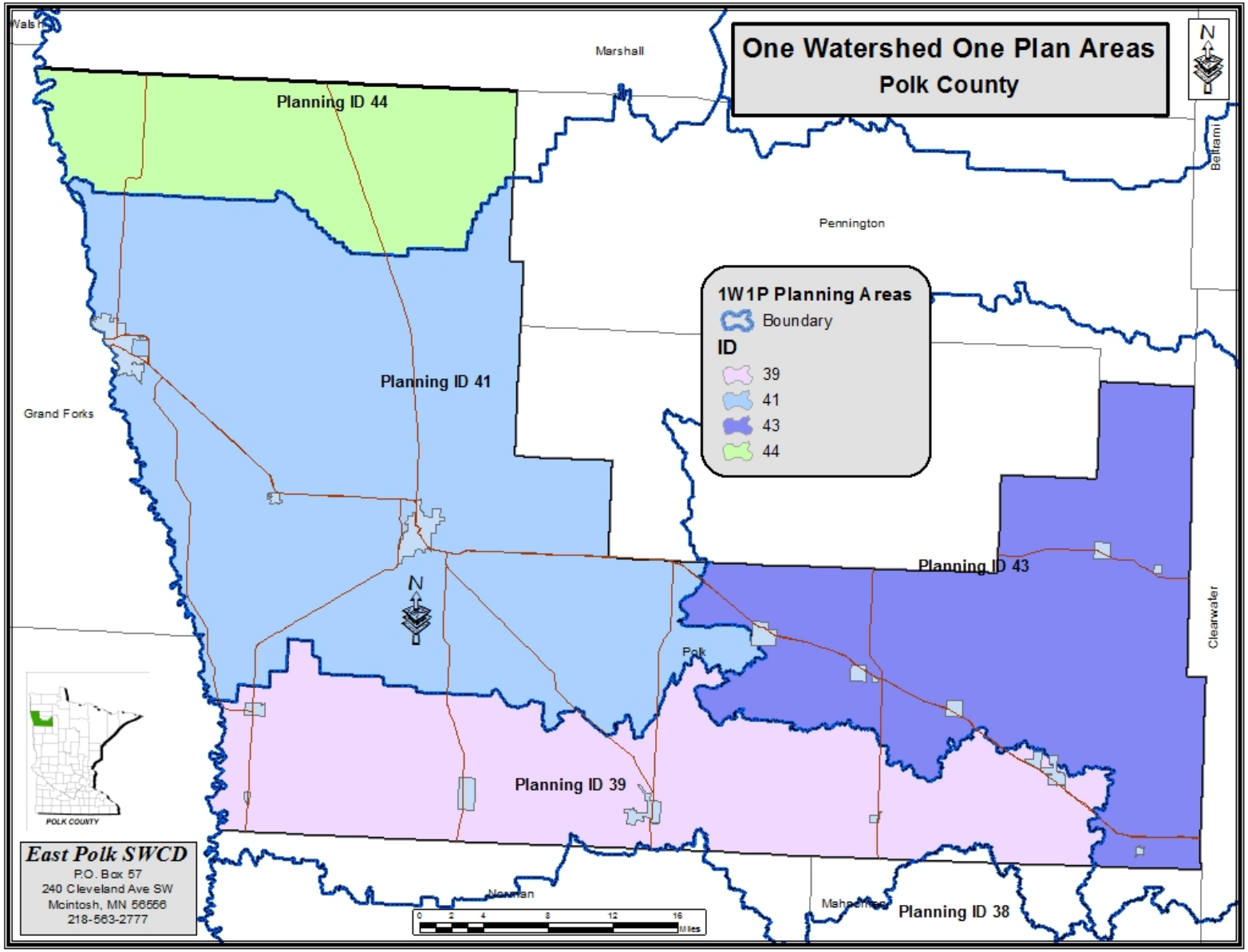
Water Quality in the Sand Hill River Watershed

The following is an overview of the stream sediment content at selected sites based on turbidity measurements taken in the Sand Hill Watershed District for the years 1995 through 2010 by Danni Halverson, River Watch Environmental Scientist, International Waters Institute (IWI). Turbidity data for the given Regional Assessment Locations (RALs) was analyzed with turbidity values being compared to annual ecoregion values for minimally impacted streams from the work of McCollor and Heiskary (1993). Turbidity data values were then plotted in an attempt to show sediment trends for the RALs. Data used in this analysis was collected by Red River Watershed Management Board staff, River Watch schools, and Minnesota Pollution Control Agency (MPCA) staff. The data used in preparation of this report was mined from the River Watch Website,

http://riverwatch.umn.edu/ and is also available through the MPCA's Environmental Data Access website, http://cf.pca.state.mn.us/data/eda/index.cfm. Data outlier's exceeding 3 standard deviations from the site mean were removed for each site prior to use in this analysis.

Sites and Water Quality Variables

The sites used in this assessment are listed in the following table. Sites are listed from upstream to downstream within the table and for reference geo-spatial and planning region information is included. This list does not contain all of the water quality sites within the Sand Hill Watershed but rather a subset based on those sites that were identified as RALs. Also, not all of the RALs are identified here only those with enough data to use in analysis.


One Watershed One Plan Areas
Polk County
Planning ID 44
Planning ID 41
Planning ID 43
Planning ID 39
Planning ID 38
1W1P Planning Areas
Boundary
ID
39
41
43
44
Marshall
Pennington
Grand Forks
Polk
Clearwater
Beltrami
Norman
Mahnomen
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
0 2 4 8 12 16
Miles

Grand Marais Creek Watershed

Refer to the One Watershed, One Plan (1W1P).

Lower Red Lake Watershed

Refer to the One Watershed, One Plan (1W1P).

Clearwater Watershed

The subwatershed is located in parts of the Lake-Washed Till Plain and Moraine physiographic area of the RLWD. The surficial geology of the area consists of mainly glacial tills to the south, peat to the northeast, lake-washed till to the northwest and sand to the southwest. The glacial till deposits consist of sandy, clay-silt loam containing fine to medium gravel with a scattering of boulders. The peat deposits are generally only a few feet thick, accompanied by the poor drainage and the water table at or near the land surface. Sand deposits are described as being very-fine to fine and commonly less than 20 feet thick. The lake-washed till deposits have a composition similar to the glacial till and are overlain in many local low areas by thin deposits of clay, silt, sand and peat. In the southern section of the subwatershed, just north of Bagley (and other small regions to the north), deposits of sand and gravel from outwash and ice contact features are present. The deposits consist of fine sand to medium gravel, with thicknesses ranging from a few feet to almost 100 feet. Local topography is generally hilly, with improved drainage over other areas in the watershed.

Glacial sediment aquifers in the region provide moderate amounts of groundwater. Suitable yields of 5 gpm or more for domestic use can be found in sand lenses within the till. These lenses are often localized and yields can vary and may accommodate municipal or industrial uses. Outwash and ice-contact sand and gravel aquifers are the best source in the watershed for alarge groundwater supply. Yields can reach several hundred gpm. The areal extent of the aquifer is fairly large, and water quality is adequate for municipal, industrial, domestic and irrigation use. Hardness is generally greater than 180 mg/l, and iron content may be high. Paleozoic sediments consisting of shale and limestone are discontinuous and underlie the glacial sediments along the western side of the subwatershed. Precambrian crystalline rocks underlie glacial sediments in most of the watershed. The fractured surface of crystalline rocks may provide an adequate supply of groundwater for localized domestic use but are not a good commercial or municipal source of groundwater.

Sand Hill River Watershed

The following information has been taken from the Sand Hill River Watershed District Watershed Management Plan. The Sand Hill River basin consists of glacial lake deposits, lake shore deposits, till and a small amount of ice-contact deposits overlying the bedrock. Bedrock in the east part of the basin consists of Precambrian, undifferentiated igneous, and metamorphic rock. Bedrock in the west part of the basin consists of a small band of Cretaceous, fine-grained sandstone and shell. Clay and silt lake deposits dominate the Lake Agassiz plain bordering the Red River. A transition zone between the lake plain and the glacial moraine areas is formed by lake shore deposits, delta sand, and gravel.

There are two aquifer systems of note within the SHRWD, a deep aquifer and a shallow aquifer. The deep aquifer is the Cretaceous aquifer. Depths to the aquifer are approximately between 200-600 feet below mean sea level. The shallow aquifer is a glacial drift aquifer, and it is distributed through the SHRWD. As little as 20 feet or less of till overlie some of these areas. The amount and type of material overlying an aquifer is important because it largely determines recharge characteristic, the potential for contamination, and the degree of interaction with surface waters. Glacial drift aquifers within the SHRWD may be surficial and unconfined, meaning an impervious layer above the aquifer is absent and the water table is in equilibrium with the atmosphere. Alternatively, glacial drift aquifers may be buried. Buried aquifers are typically confined by an impermeable layer of material above them, less susceptible to potential contamination and at a pressure greater than atmospheric. Buried aquifers are rare within the District.

The shape of glacial drift aquifers within the District is typically long and narrow, oriented north and south along a beach ridge. Aquifer thickness varies from 10 to 50 feet and potential yields range from 10 to 500 gallons per minute. The flow direction of both deep and shallow aquifers is generally towards the west-northwest to the Red River.

Irrigation Use

Irrigation for crop production is a minor concern in Polk County. There are few agricultural users within the SHRW that draw water for irrigation purposes. A natural tributary to the Red River west of Nielsville has been impounded with a dam to create a reservoir for irrigation. In the northeastern part of the county irrigation is used for the cultivation of wild rice paddies. In the central portion of the county irrigation is used for the production of row crops.

Irrigation Water Use in Polk County in Millions of Gallons per Day, *USGS Data, 2010*

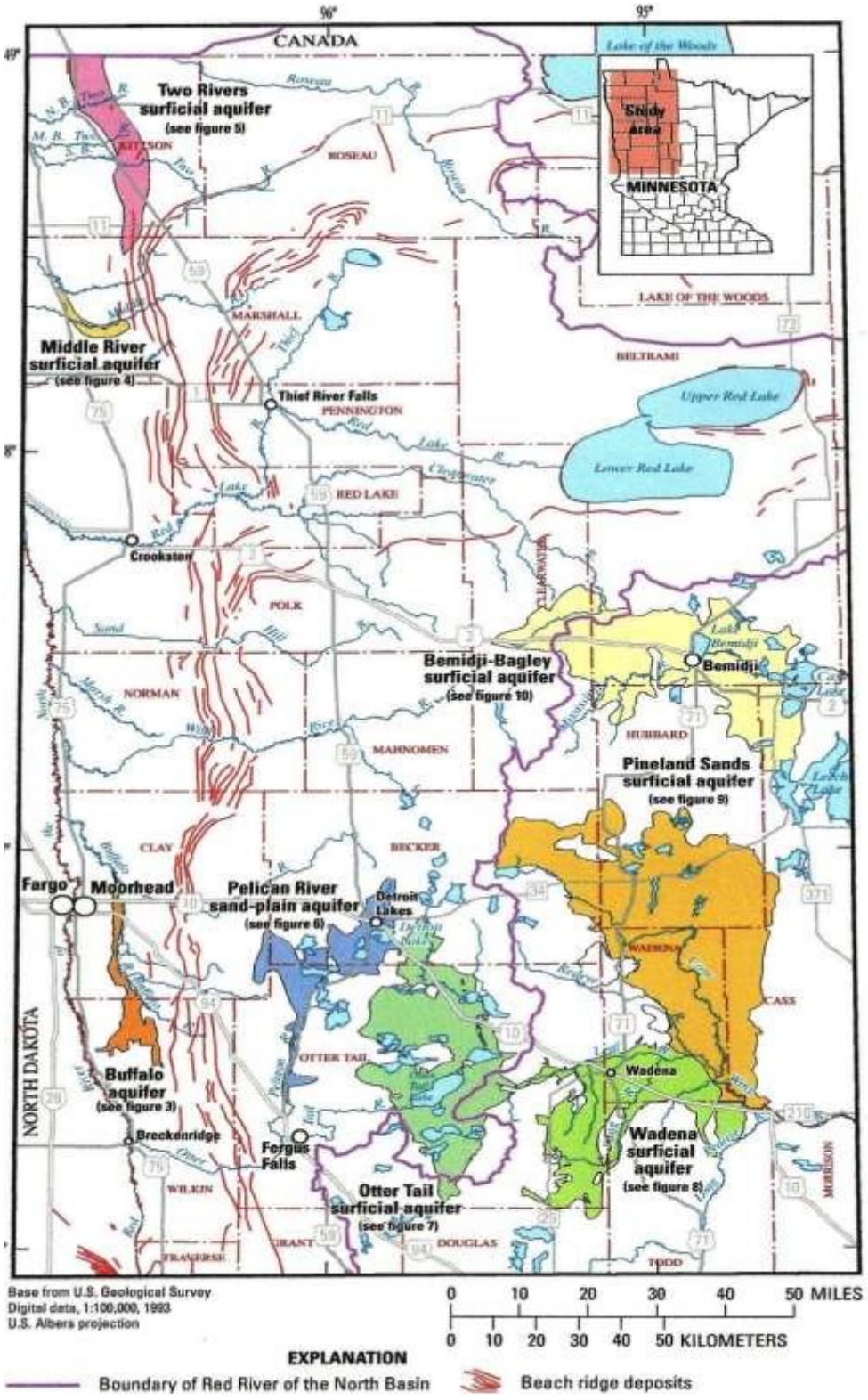
Groundwater	Surface Water
0.12 Mgal/d	3.42 Mgal/d

Beach Ridge Deposits

Discontinuous beach ridge deposits of very fine- to medium-grained sand, with lenses of fine- to medium-grained gravel, are located throughout the Red River Basin. However, the horizontal and vertical extents of the beach ridges are highly variable. The beach ridge deposits range in length from one to tens of miles, and they range in width from a few hundred feet to several miles. The ridges can range in thickness from a few feet to 50 feet and may exceed 150 feet. Groundwater recharge and discharge rates of the beach ridge deposits throughout the Red River Basin are unknown because of the variability of particle size, sediment sorting, geographic distribution, and hydraulic connectivity of the ridges.

Quantity and quality of groundwater from the deposits vary greatly within the Red River Basin and within individual deposits because the beach ridge deposits are discontinuous and variable. The quantity of usable groundwater from the ridges generally increases to the south in the basin. Groundwater from the beach ridge deposits most commonly is used for domestic water supply and secondarily for small-scale sand and gravel mining operations. Theoretical well yields from the beach ridge deposits are unknown, USGS report, *Ground-Water Availability fromSurficial Aquifers in the Red River of the North Basin, Minnesota* (Reppe 2005)

Aquifer locations in the Red River Valley

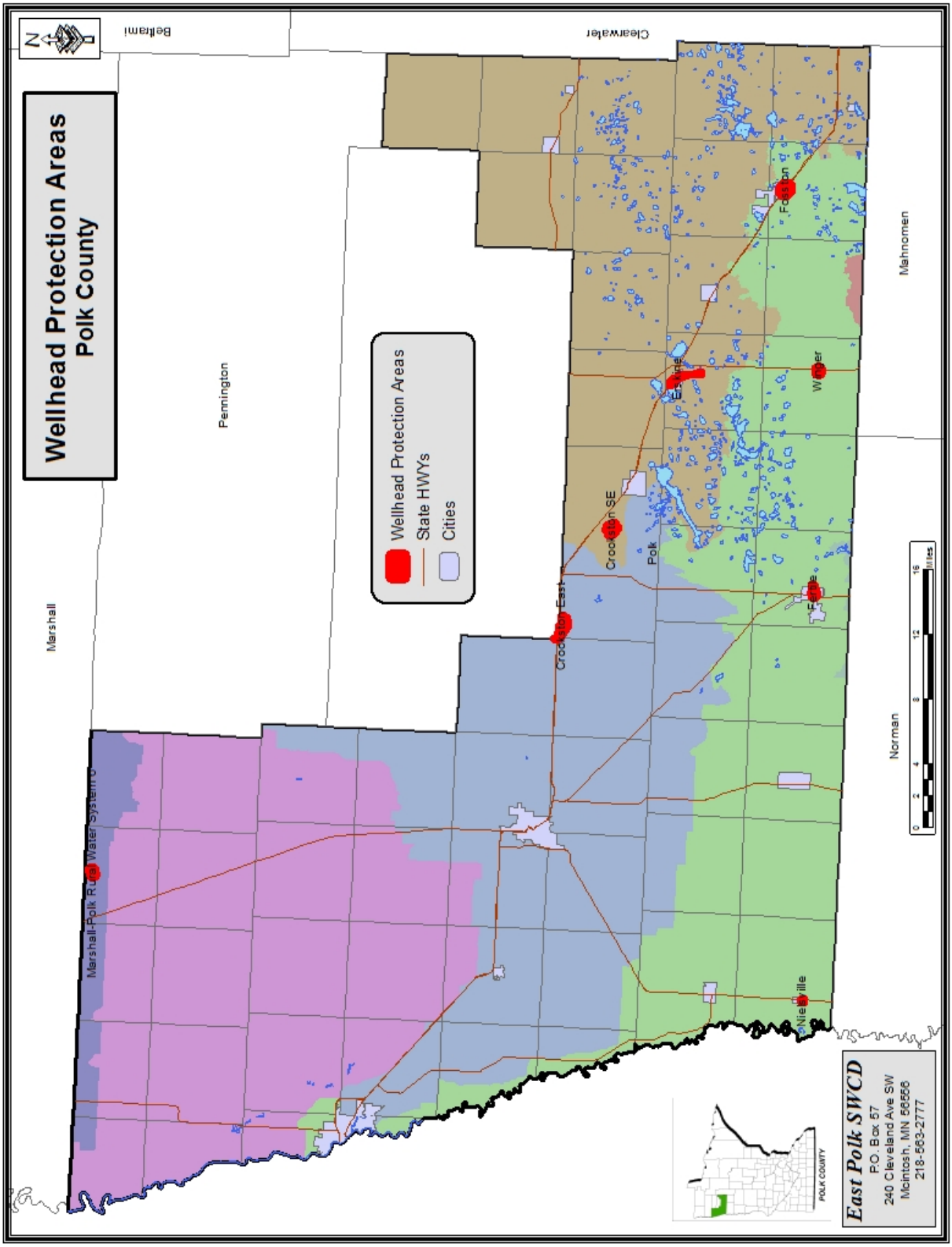


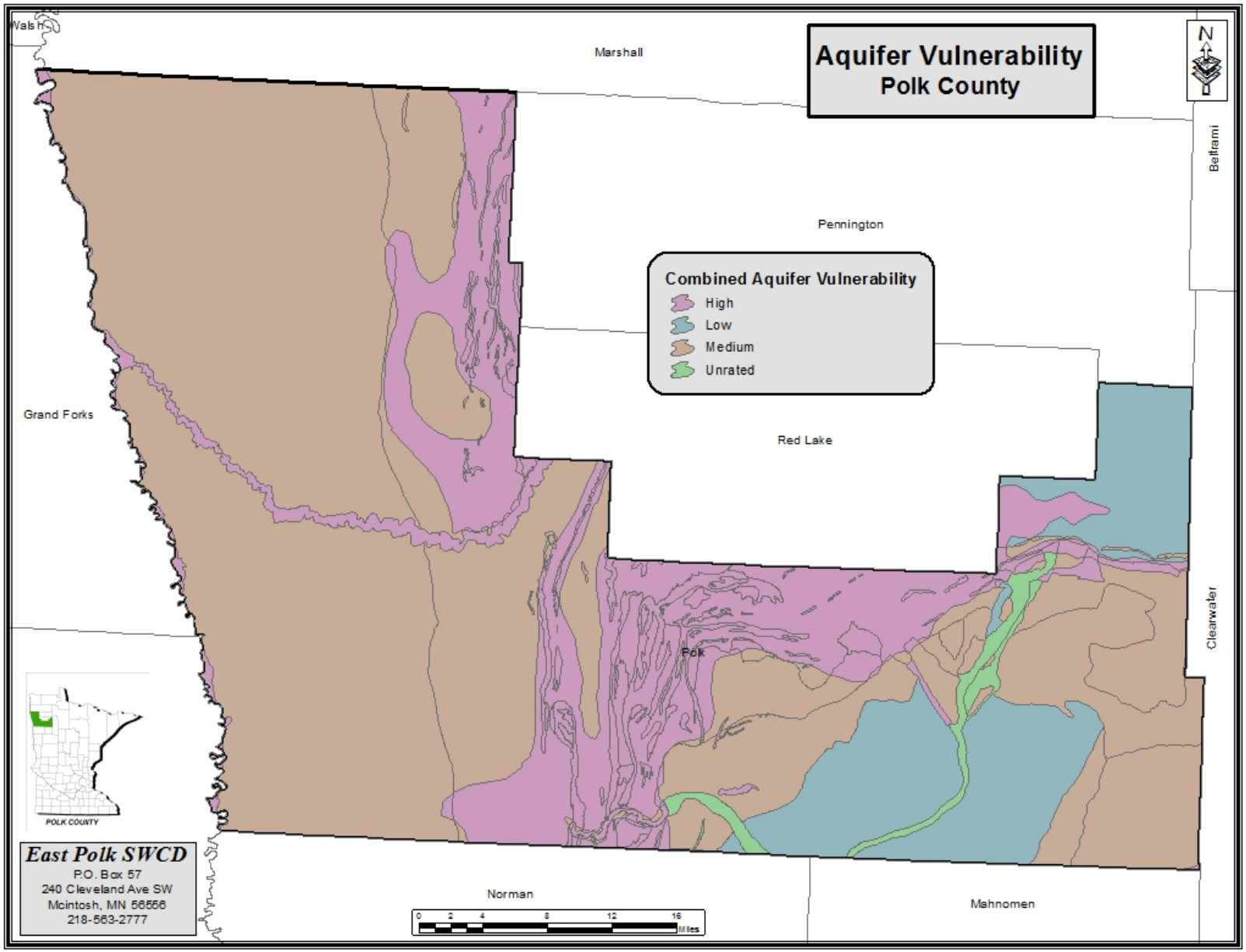
Source Water Protection

The Minnesota Department of Health has completed source water assessments for all the public water systems in the state, as required by the 1996 amendments to the Federal Safe Drinking Water Act. Any city over 1,000 people need to submit or complete a Water Supply Plan per the MN DNR rules. The following cities have had a MDH source water assessment and MN DNR appropriation water permit:

City of Nielsville – three active groundwater well – Low DWSMA Vulnerability
City of Climax – two active groundwater wells – Low DWSMA Vulnerability
City of Beltrami – two active groundwater wells – Low DWSMA Vulnerability
City of Fertile - two active groundwater wells – Moderate DWSMA Vulnerability
City of Fosston – three active groundwater wells – Low DWSMA Vulnerability
City of Crookston – four active groundwater wells – Moderate DWSMA Vulnerability
City of Winger – two active groundwater well – Low DWSMA Vulnerability
City of Erskine – two active groundwater wells – High DWSMA Vulnerability
City of McIntosh – two active groundwater wells – Low DWSMA Vulnerability

The water supply systems that are implementing a wellhead protection plan that has been approved by the Minnesota Department of Health under Minnesota Rules 4720 include the cities of Fertile, Nielsville, and Crookston. The water supply systems in the process of wellhead protection plan development as defined under Minnesota Rules Chapter 4720 are the communities of McIntosh, Climax, Beltrami, Winger, Erskine, and Fosston.


Wellhead Protection Areas
Polk County
Wellhead Protection Areas
State HWYs
Cities
Beltrami
Clearwater
Pennington
Mahnomen
Marshall
Norman
Polk
Crookston SE
Crookston East
Fertile
Erskine
Fosston
Winger
Nielsville
Marshall-Polk Rural Water System
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
McIntosh, MN 56556
218-563-2777


Aquifer Vulnerability
Polk County
N
Walsh
Marshall
Beltrami
Pennington
Combined Aquifer Vulnerability
High
Low
Medium
Unrated
Grand Forks
Red Lake
Clearwater
Polk
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
Norman
Mahnomen
0 2 4 8 12 16
Miles

MN DNR Water Use Permit Appropriations

Permittee	Usename	Permit Volume (MGY)	Permit GPM	Use 2016 (MG)
WINGER, CITY OF	Municipal Waterworks	15.5	150	6.34
ERSKINE, CITY OF	Municipal Waterworks	36	530	25.25
MCINTOSH, CITY OF	Municipal Waterworks	24	225	18.4
CLIMAX, CITY OF	Municipal Waterworks	15	320	15.4
FERTILE, CITY OF	Municipal Waterworks	39	400	25.24
NIELSVILLE, CITY OF	Municipal Waterworks	10	336	4.1
CROOKSTON, CITY OF	Municipal Waterworks	500		208.13
CROOKSTON, CITY OF	Municipal Waterworks	1750		112.98
BELTRAMI, CITY OF	Municipal Waterworks	5	80	2.2
FOSSTON, CITY OF	Municipal Waterworks	140	700	103.9

Polk County Priority Concern 2: Water Quantity

The Polk County Local Water Management Plan will focus on the quantity of water passing through the County and its associated watersheds by inventorying, assessing and evaluating the drainage infrastructure.

Due to the fluvial geomorphic characteristics of the Red River of the North Basin, Polk County is subject to frequent flooding. Some factors such as topography and increased precipitation are unmanageable, but other factors such as flood plain encroachment, channelization of waterways, land use practices and effective private drainage into public systems, are factors that can be assessed for *Best Management Practices*.

All of Polk County falls within the jurisdictional boundaries of three watershed Districts. With Watershed Districts being “special purpose” Districts and that special purpose:

103D.201 WATERSHED DISTRICT PURPOSE
“To conserve the natural resources of the state by land use planning, flood control, and other conservation projects by using sound scientific principles for the protection of the public health and welfare and the provident use of the natural resources, the establishment of watershed districts is authorized under this chapter.”

The most effective way to manage water is on a watershed perspective making it unattainable for an individual County to successfully implement a comprehensive water management agenda. It will likely be the Watershed Districts who will lead the major efforts to manage the water

quantity issues impacting Polk County. They will however need the support and cooperation of Polk County and the West and East Polk SWCDs to accomplish its work in Polk County. Many Watershed District water quantity control projects have been constructed in and outside of Polk County that have assisted in the reduction of flood related damages within the county. Please refer to the Long Rang Plans of the Red Lake, Sand Hill River, and the Middle-Snake-Tamarac Rivers Watershed District for more information on these and future efforts that will control the quantity of water flowing through Polk County.

The Following drainage assessments are taken from the Red Lake and Sand Hill River Watershed District plans.

Grand Marais Creek Watershed

Refer to the One Watershed, One Plan (1W1P).

Lower Red Lake Watershed

Refer to the One Watershed, One Plan (1W1P).

Clearwater River Watershed

Due to terrain, draining of wetlands for cropland and/or under-designed structures, the Clearwater River subwatershed experiences occasional flooding throughout the subwatershed. Spring flooding is almost an annual occurrence in this watershed. Damages associated with this type of flood are to public infrastructure, personal property, cropland and public resources (fisheries, wildlife, soils and water quality). Agricultural flooding was identified as the highest priority flooding issues.

Lakes are prominent and important resources in this watershed. In particular, a number of small lakes are found throughout the southern half of the watershed. These include a mix of recreational and natural environment lakes that provide seasonal and migratory habitat for a variety of species.

Wetland areas are scattered throughout the area. These wetland areas are considerably denser in the extreme northeastern portion of the subwatershed, especially within the Red Lake Reservation, where the original wetlands are intact. Many of the wetlands have been altered by farm drainage, and many wetlands have been drained for the purposes of agricultural production.

Sand Hill River Watershed

There are numerous public and private drainage systems in the SHRWD, specifically constructed since the early 1900's, to provide agricultural drainage. The SHRWD has legal jurisdiction over many of these ditch systems, with the authority to approve proposed improvements to be made to the ditches. Several other legal ditch systems remain under the jurisdiction of Polk County. Most of these drainage systems are located in the lake plain geomorphic region, since this area is flat,

has poorly drained soils, and lacks a natural drainage network. Without the drainage network, water would stagnate in the fields and drown crops. The ditch networks have improved the connection between areas that would otherwise not be hydrologically connected.

The need for and intensity of drainage differs to some degree between the eastern glacial moraine and the western glacial lake plain. The development of land for agriculture in the early 1900s modern agriculture would not be possible within the western portion of the District without improved drainage. This portion of the District lacked "natural" drainage because of its origin as the lake bed of Glacial Lake Agassiz. State and federal initiatives through the 1970s encouraged maximizing acreage for agricultural production. Landowners and others undertook drainage within the District's eastern, glaciated moraine area in selected areas to address specific isolated drainage problems.

Minnesota Drainage Law (MSA 103E) provides a set of rules to administer and regulate drainage activity within the state. One of the District's main responsibilities is to administer their state obligated responsibility under MSA 103E. These responsibilities are associated with both legal and private drainage systems. The legal system is administered jointly with the county or counties overlapping the watershed district. County ditches were originally under the jurisdictions of counties. MSA 103E specifies that ditch systems undergoing an improvement or redetermination of benefits process, or new systems must revert to the jurisdiction of the appropriate watershed district, if one exists. The county may also transfer jurisdiction of a ditch system without a project by resolution of the county board of commissioners. The SHRWD presently administers a number of miles of legal drainage systems, acquired either through petitions of new systems, improvements to existing systems, or the repair of existing systems under SHRWD jurisdiction. Landowner's efforts to engage in private drainage projects (outside of the authority of MSA 103E), are subject to the SHRWD permit system (MSA 103D).

Flood Damage is another critical issue in the Red River Valley area and the SHRWD. Flooding causes a significant burden, particularly for the agricultural sector. Damage from flooding is most severe in the western portion of the SHRWD. Flooding results in financial damages as well as social and emotional damages that are more difficult to quantify. The majority of flood damages are agricultural in nature. However, Beltrami, Nielsville and Climax are also frequently threatened with flood damages. The SHRWD initiated projects to protect Beltrami and Nielville several years ago, which has been beneficial. Climax are currently in the process of being studied for flood damage reduction measures under existing MN DNR financing assistance. In general, the lake plain area of the SHRWD is prone to flooding due to the flat landscape and channels that have relatively low capacities for the amount of drainage coming to them. The water from the portions of the watershed contributing to the lake plain area of the SHRWD tends to release its runoff faster than the lake plain channels can carry it away. This is due to the capacity limitations of many of the Polk County legal ditch and natural channel systems in the lake plain. More recently the SHRWD has seen an increase in landlocked basin flooding in the beach ridge and moraine areas of the District.

Surface drainage through the construction of private and public drainage systems has historically been the primary means of providing suitable soil conditions for crop production. Soils within

the Red River Valley were historically considered "too tight" for tile drainage, because the close spacing of tiles necessary for effective drainage. However, there is a growing trend of pattern drainage tiling within the Red River Valley. This change has come about due to several factors, including improved technology and equipment for tile installation, increase prices for agricultural commodities, increase crop yields from drained land, value of farm land, and enhanced farming operations from drained land. The effects of tiling on downstream water quality and quantity are being studied by various agencies, but remains basically unknown. Current thoughts are that quantity changes on peak rates of flow will not be significant from a downstream flooding perspective. However, persistent long term low flows may affect channel maintenance and land access opportunities.

Drainage System Management

With the County being the drainage authority on some public drainage systems and the individual Watershed Districts on others it will be vitally important to coordinate maintenance, repairs, and improvements to these systems. The Polk County Ag and Drainage department indicates that there are 830 miles of legal drainage systems they maintain. The Red Lake Watershed District is the drainage authority on 295 miles of ditches throughout their entire watershed jurisdiction. The Middle Snake Tamarac River Watershed District is the drainage authority on 108 miles of ditches throughout Polk County. No similar data available from the Sand Hill River Watershed District. Miles of ditches within Polk County that are required to have buffers:
RLWD – 105.15 miles
SHRWD – 80.46 miles
Wild Rice River Watershed District (WRRWD) – 1.58 miles
Polk County Public Ditches – 770.8 miles
Public Waterways (DNR Public Waters) – 551.83 miles

Reference to Basin Tech and Scientific Advisory Committee publication - Sept. 15, 2014 - http://www.rrbdin.org/wp-content/uploads/2014/10/BTSAC-BP3-Final-9-15-14a.pdf

The following assessment has been taken from the Red Lake River Watershed Farm to Stream Tile Drainage Water Quality Study, 2009.

Prior to this project, there were a lot of theories about how the increasing amount of tile drainage in the Red River Basin would affect water quality. However, there was a lack of actual water quality data from tile drainage within the basin. This study was designed to provide actual data from tile drainage in several different areas through-out the Red Lake Watershed District. In each area, tile drainage water quality has been compared with surface drainage water quality. The study also compares flow (sfc. v. tile) and different methods of tile drainage.

Generally, conventional agriculture tile drainage should have a positive impact on the problems of high turbidity, total suspended solids, and total phosphorus in the Red River Basin. Unfortunately, there are "side effects" of high nitrate and conductivity levels. Minnesota scientists are researching possible methods for reducing these "side effects."

The wild rice paddies were an exception in that the wild rice paddy main-line tile water had all the water quality benefits of conventional agriculture tile, but without the high nitrate levels. Tile drainage for conventional agriculture has little benefit to water quality when the ground is frozen and the tile is not running (during spring runoff). The benefits are also lessoned when the ground is saturated enough for surface runoff to occur.

The existence of a grassed waterway appeared to moderate water quality.
Data analysis supports the hypotheses that were expressed at the beginning of the project. Peak flows generated from a surface drained field clearly exceed the peak flows from a tile drained field (tile and surface drainage included). The duration of flow from tile is much longer than the duration of flow from surface drainage. So, the total volume of drainage from a tiled field is clearly greater than the total volume of drainage from a field that lacks tile drainage.

- Tile drainage in the Red River Basin reduces peak flows from an individual field relative to surface drained fields during runoff events.
- Tile drainage in the Red River Basin increases the total volume of runoff in the long-term relative to surface drained fields.
- Antecedent conditions have a significant role on the influence of tile drainage during a runoff event. A rainfall event will have a varying effect upon runoff due to varying levels of initial soil moisture, rainfall amount, rainfall intensity, and rainfall duration.
- These results pertain only to tile drainage systems with similar soils and topography in Red River Basin that do not have surface inlets.

There are plans to continue the monitoring efforts of this study, particularly the flow monitoring and runoff event sampling. Monitoring and research efforts should also be targeted at evaluating what happens to the concentrated discharges of nitrates after they enter a river system. Also, extra monitoring could be done in the lower Red River Valley, closer to the Red River where soils have higher clay content.

Priority Concern 3: Groundwater

Surface water quality is of primary concern for Polk County, but we will also be responsive to the need to monitor and protect our ground water resources. We will participate to our fullest capacity but state and federal agencies such as Minnesota Department of Health (MDH), and USGS will continue to be the primary source for groundwater protection and management. Groundwater sensitivity to pollution of the shallow systems in the area was produced by the MN DNR, based upon the water table depths and soil textures. The beach ridge area has the highest sensitivity to pollution, followed by the glacial moraine area, and then the lake plain area.

Priority Concern 4: Management, Enhancement and Preservation of Natural Resources

Polk County is concerned with the preservation and enhancement of its natural resources. The geology of Polk County is divided into 3 distinct areas; the glacial-lake plain, glacial lake washed till plain and glacial moraine region. These major areas, because of their size, unique geographical features, and wide diversity of natural resources are of significant benefit to the area and citizens.

- Polk County in cooperation with other local, state, and federal agencies will work to restore, enhance and protect these areas through programs and projects that accomplish this; cautious it is not done at the expense of the local economy.

Proper management and preservation of these unique ecosystems is a Priority Concern for Polk County because of the fragile balance that is needed to sustain the natural resources found in this area.

The Glacial Lake Agassiz Beach Ridge area in Polk County contains some of the largest tracts of native prairie in the state. These prairies are of high quality and include good examples of dry mesic and wet prairies. Saline soils are common in these areas and support unusual prairie types composed of species tolerant to elevated salt levels, including rare species such as; alkali cord grass (*Spartina gracilis*), northern gentian (*Gentiana affinis*), and Hall's sedge (*Carex halliana*). There are several Minnesota listed rare plants found in the Glacial Lake Agassiz Beach Ridge Area, including the federally threatened and state endangered western prairie fringed orchid (*Platanthera praeclara*). The largest known populations of this species in the world are found in Polk County. Other state listed endangered species include; pale moonwort (*Botrychium pallidum*), Indian ricegrass (*Oryzopsis hymenoides*), and gray ragwort (*Senecio canus).*

Located within the Glacial Lake Agassiz Beach Ridge is the Glacial Ridge National Wildlife Refuge composed of 24,000 acres. It is the nation's largest prairie and wetland restoration project. In addition to its biological importance, the restoration of Glacial Ridge should help improve water quality for the City of Crookston and reduce flooding in the Red River Valley. Habitat fragmentation and Invasion by exotic species (non-native plants and animals) are the most significant threats to the project's native diversity. The property connects to other wildlife and recreational areas and, when the project is complete, The Nature Conservancy and its partners will have restored more than 8,000 acres of wetland and about 16,000 acres of Tallgrass Prairie. There will be nearly 20,000 acres enrolled into the federal Wetlands Reserve Program, which was turned over to the US Fish and Wildlife Service (USFWS) in 2004 and was designated as a national wildlife refuge.

Rydell National Wildlife Refuge located within the Glacial Moraine area. The Refuge was established in 1992 and composed of 2,100 acres hosting more than 7,800 visitors per year. The Refuge is a combination of maple/basswood/oak forest, wetlands, tallgrass prairie and bogs. The Refuge offers annual deer hunts for youth and disabled. Refuge objectives are to provide nesting, feeding and resting habitat for waterfowl and other migratory woodland and grassland birds, serve as a regional destination for environmental educational opportunities, provide woodland

and prairie habitat for resident wildlife and to provide opportunities for wildlife observation and outdoor recreation.

The Vesedahl Wetland Mitigation Project is also located within the Glacial Moraine area. The Vesedahl project is a wetland restoration project in Polk County which will be used by MnDOT and BWSR to offset wetland impacts that cannot be mitigated on site for state, county, and township road projects in northwestern Minnesota. MnDOT has acquired approximately 1900 acres of farmland. The project will restore approximately 750 acres of land to its pre-agricultural wetland status while the remaining non-wetland acreage will be planted with native grasses. Once the restoration work is completed, control of this land will be transferred from MnDOT to the MnDNR and it will become a wildlife management area. The MN DNR operates 47 additional Wildlife Management Areas in Polk County.

There are large parcels of USFWS and MN DNR land scattered throughout the county that are open to the public to utilize. USFWS reports 13,314 acres of Waterfowl Production Areas in the county. There are 21 known calcareous fens identified on the Minnesota Department of Natural Resources List of Known Calcareous Fen Sites (June 30, 2001) located in Polk County. Calcareous seepage fens are numerously found in the Beach Ridge Area. This fen type is rare, with a precarious biology that makes them vulnerable to change.

Calcareous Fen Sites in Polk County

Site Name	Fen ID NO.	Township	Range	Section(s)
Chicog WMA East	6403	T148N	R45W	NWSWSE28, SWNE33, NENE33,
Chicog WMA West	6405	T148N	R45W	NE29, WSE20
Enerson WMA	16306	T149N	R40W	NENW17
Godfrey Prairie	16268	T148N	R44W	NWSE09, NE09
Gully 27	16326	T150N	R39W	SWNE27
Gully 22	16303	T150N	R39W	NE22, WSE22
Gully 23	16307	T150N	R39W	SE23
Gully 25	16312	T150N	R39W	NWNE25
Gully 30	35382	T150N	R39W	NNE30, NENW30, SSE19
Kertsonville WMA	6402	T149N	R45W	SSESW16
Chester 24	35384	T150N	R40W	SN24, NNSW24, NSE24
Chester 29	18396	T150N	R40W	S29
Kittleson Creek Mire	10149	T147N	R44W	SS06, 0W07
Onstad WMA	16270	T147N	R45W	W01
Pankratz Prairie South	245	T149N	R45W	SWNE17

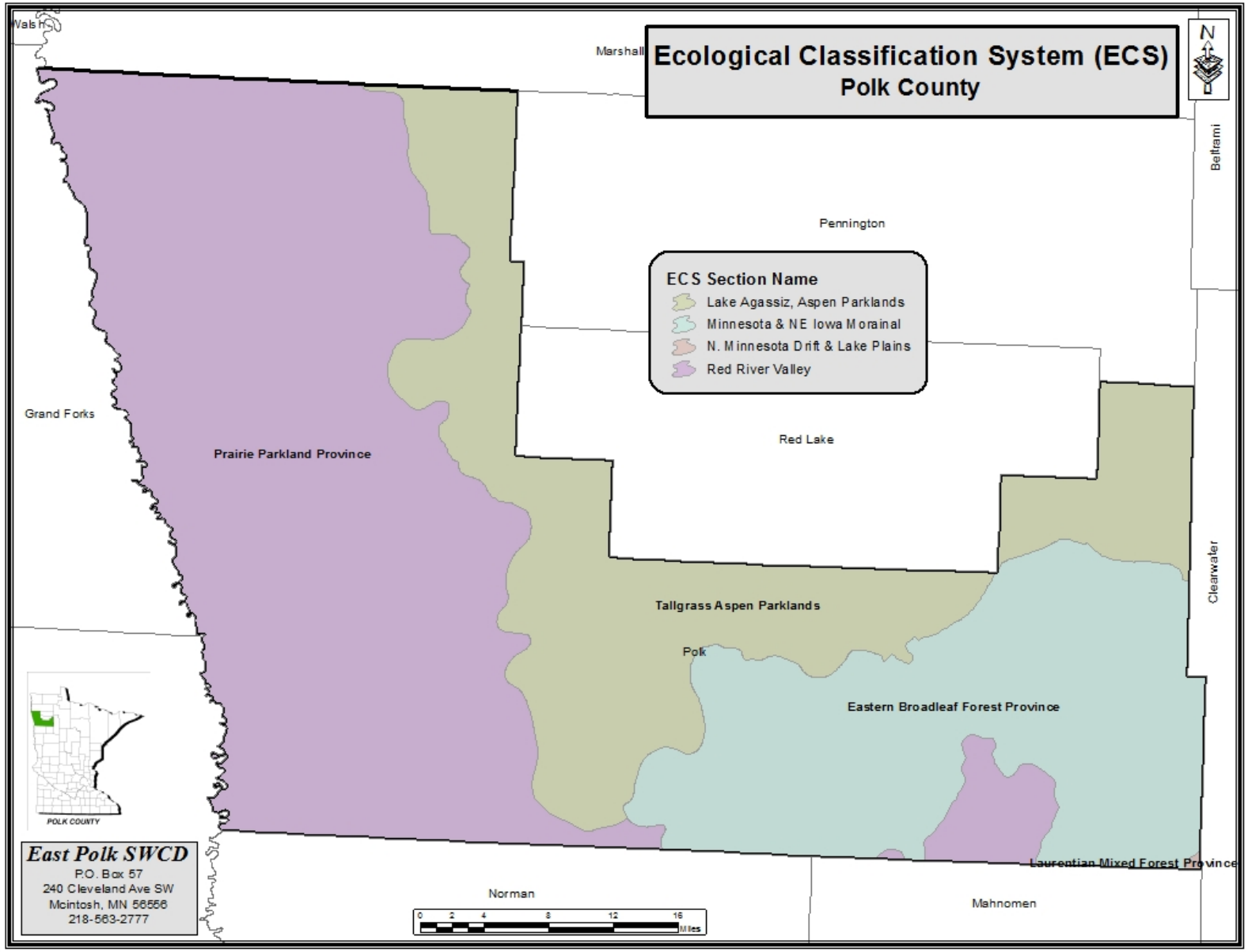
Pembina Trail: Crookston	1226	T149N	R44W	SSW19
Pembina Trail: TNC	17211	T149N	R44W	ESWNW30
Thorson Prairie WMA South – a	35142	T148N	R45W	SE08
Thorson Prairie WMA South – b	33545	T148N	R45W	NE08
Thorson Prairie WMA South – c	35143	T148N	R45W	NWSE05
Thorson Prairie WMA South – d	35144	T148N	R45W	SWNE05

Conservation Reserve Program

One major concern is the large acreage of Conservation Reserve (CRP) program acres that are being taken out of grass and put into production. Many of these acres are in the prime habitat areas for sharp-tailed grouse and prairie chickens. Wild turkeys have also been introduced and are increasing in numbers. Some of these areas are also identified as MN DNR Deer Wintering areas.

CRP Expiration AC/YEAR (taken from the Conservation Reserve Program website (Total Acres, Continuous and General signup)

CRP Expiration	Acres
FY2017	6,675.6
FY 2018	13,943.6
FY 2019	9,801.6
FY 2020	3,336.3
FY 2021	1,690.3
FY 2022	2,916.7
FY 2023	1,884.7
FY 2024	1,565.3
FY 2025	3,142.3
FY 2026	3,448.4
TOTAL	**48,404.8**


Ecological Classification System (ECS)
Polk County
N
ECS Section Name
Lake Agassiz, Aspen Parklands
Minnesota & NE Iowa Morainal
N. Minnesota Drift & Lake Plains
Red River Valley
Walsh
Marshall
Pennington
Beltrami
Grand Forks
Red Lake
Prairie Parkland Province
Tallgrass Aspen Parklands
Clearwater
Polk
Eastern Broadleaf Forest Province
Laurentian Mixed Forest Province
Norman
Mahnomen
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
0 2 4 8 12 16
Miles

Ecological Regions of Polk County

The Minnesota Department of Natural Resources (MnDNR) and the U.S. Forest Service have developed an

Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota following the National Hierarchical Framework of Ecological Units. Ecological land classifications are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The system uses associations of biotic and environmental factors, including climate, geology, topography, soils, hydrology, and vegetation. There are eight levels of ECS units in the United States. Map units for six of these levels occur in Minnesota: Provinces, Sections, Subsections, Land Type Associations, Land Types, and Land Type Phases. Ecological subsections in Polk County include the Aspen Parklands, Red River Prairie, and Hardwood Hills subsections.

Species in greatest conservation need (SGCN) are defined as native animals whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long term health and stability. Minnesota's State Wildlife Action Plan (SWAP) identifies conservation needs for species of concern, including threatened and endangered wildlife and other wildlife species. Minnesota's SWAP titled, "Tomorrow's Habitat for the Wild and Rare" is a strategic plan focused on managing Minnesota's populations of "species in greatest conservation need." In Minnesota, in 2005, 292 species meet the definition of species in greatest conservation need (SGCN). These species include mammals, birds, reptiles, amphibians, fishes, insects, and mollusks and represents about one-quarter of the nearly 1,200 animal species in Minnesota that were assessed for this project. Minnesota has update their SGCN list in 2015 with a total of 346 SGCN including species form all major animal taxonomic groups.

Minnesota's SWAP identifies specific key habitats to be conserved and enhanced in each of Minnesota's 25 ecological subsections (see http://www.dnr.state.mn.us/ecs/index.html). It also describes key habitats relative to the ecological subsection, focusing on the important components of the habitats, both in terms of habitat quality and features important to SGCN.

Aspen Parkland Subsection Overview

The Aspen Parklands Subsection, located in northwestern Minnesota, is a mix of lacustrine plain and shoreline (beach) ridges formed by Glacial Lake Agassiz, with extensive forested peatlands to the east and tallgrass prairie to the west. The subsection is the southern end of a much larger province that stretches north and west into Canada and serves as the transition zone between the prairie and forest areas. The large Roseau and Red Rivers are in this subsection, and flooding is common due to the level topography. Deep lakes are rare. This subsection contains large complexes of wetlands, aspen and brush prairie with dry prairie on beach ridges.

There are 85 Species in Greatest Conservation Need (SGCN) known or predicted to occur within the Aspen Parklands. These SGCN include 30 species that are federal or state endangered, threatened, or of special concern. Gray wolves, sharp-tailed grouse, sandhill cranes, eared grebes, northern harriers, marbled godwits, American bitterns, Franklin's gulls, Assiniboia skipper, great

gray owls and moose make this subsection unique. It is also a major migratory stopover and breeding area for waterfowl. For more information on the Aspen Parkland Subsection or Species in Greatest Conservation Need and their key habitats refer to the "Tomorrow's Habitat for the Wild and Rare" a strategic plan focused on managing Minnesota's populations of "species in greatest Conservation need."

Red River Prairie Subsection Overview

The Red River of the North forms the western boundary of the Red River Prairie Subsection and Minnesota. The former range limit of what was once tallgrass prairie forms the eastern boundary. Wet prairies were an important habitat in this subsection. The dominant landform is the large, flat, lake plain of Glacial Lake Agassiz, and associated landforms including beach ridges and sand dunes. Rich soils deposited from Glacial Lake Agassiz make this subsection highly desirable for agriculture. The Agassiz beach ridges include a significant proportion of the state's remaining prairie acres, half of which are protected in preserves. Most of the remainder of the subsection has been drained using tile and ditching for row crop production. Less than 1 percent of former prairie remains, and remnant patches are often too small to be fully functional, due to the altered surrounding landscape. Some prairie remnants that are not protected in preserves are enrolled in conservation programs, but many have no formal protection and are subject to further agricultural development or mining for construction aggregates. Dams and channelization disrupt aquatic connectivity and degrade habitat along rivers.

There are 83 Species in Greatest Conservation Need (SGCN) known or predicted to occur within the Red River Prairie. These SGCN include 36 species that are federal or state endangered, threatened, or of special concern. Scattered remnant tracts of native prairie and riparian woodlands in the Red River Prairie are home to a surprising variety of wildlife. Some of the most pristine and extensive prairie tracts remaining in the state are found here. Featured wildlife include greater prairie chickens, marbled godwits, loggerhead shrikes, poweshiek skippers, northern pocket gophers and northern grasshopper mice. Lake sturgeon and black sandshells are found in the Red River. For more information on the Red River Prairie Subsection or Species in Greatest Conservation Need and their key habitats refer to the "Tomorrow's Habitat for the Wild and Rare" a strategic plan focused on managing Minnesota's populations of "species in greatest Conservation need."

Hardwood Hills Subsection Overview

The Hardwood Hills Subsection runs through the heart of the Mississippi River flyway and central Minnesota. The Continental Divide splits this subsection; rivers to the north flow to Hudson Bay, and rivers to the south, to the Mississippi. The subsection contains numerous lakes, more than 400 greater than 160 acres and many smaller lakes. Wetlands, prairie potholes, and kettle lakes exist throughout the area. Before settlement by people of European descent, vegetation included maple-basswood forests interspersed with oak savanna, tallgrass prairie, and oak forest. Currently much of this subsection is farmed. While many wetlands have been drained, many potholes remain and provide habitat for waterfowl and shorebirds. Important areas of forest and prairie exist throughout the subsection, but they are small and fragmented. About 15

percent of the subsection is forested. Other significant land uses are tourism and outdoor recreation, especially around lakes. Increased lakeshore development and wetland loss are conservation concerns in this subsection.

There are 85 Species in Greatest Conservation Need (SGCN) known or predicted to occur within the Hardwood Hills. These SGCN include 28 species that are federal or state endangered, threatened, or of special concern. This subsection is a fascinating, wetland rich transition zone between prairies and forest, intermingled with hundreds of lakes. There is a mix of wildlife, including trumpeter swans, prairie chickens, sandhill cranes, western grebes, great egrets, great blue herons, Forster's terns, bald eagles, creek heel splitters, and least darters. This is also a major migratory corridor for forest birds and waterfowl. For more information on the Hardwood Hills Subsection or Species in Greatest Conservation Need and their key habitats refer to the "Tomorrow's Habitat for the Wild and Rare" a strategic plan focused on managing Minnesota's populations of "species in greatest Conservation need."

Biodiversity Significance

The DNR's Natural Heritage and Nongame Research Program, in collaboration with the Minnesota County Biological Survey (MCBS) identifies, describes and maps rare and high quality native plant communities in the Natural Heritage Information System (NHIS). Polk County has a unique diversity of rare species that the state listed endangered, threatened or special concern.

Rare Species found in Polk County

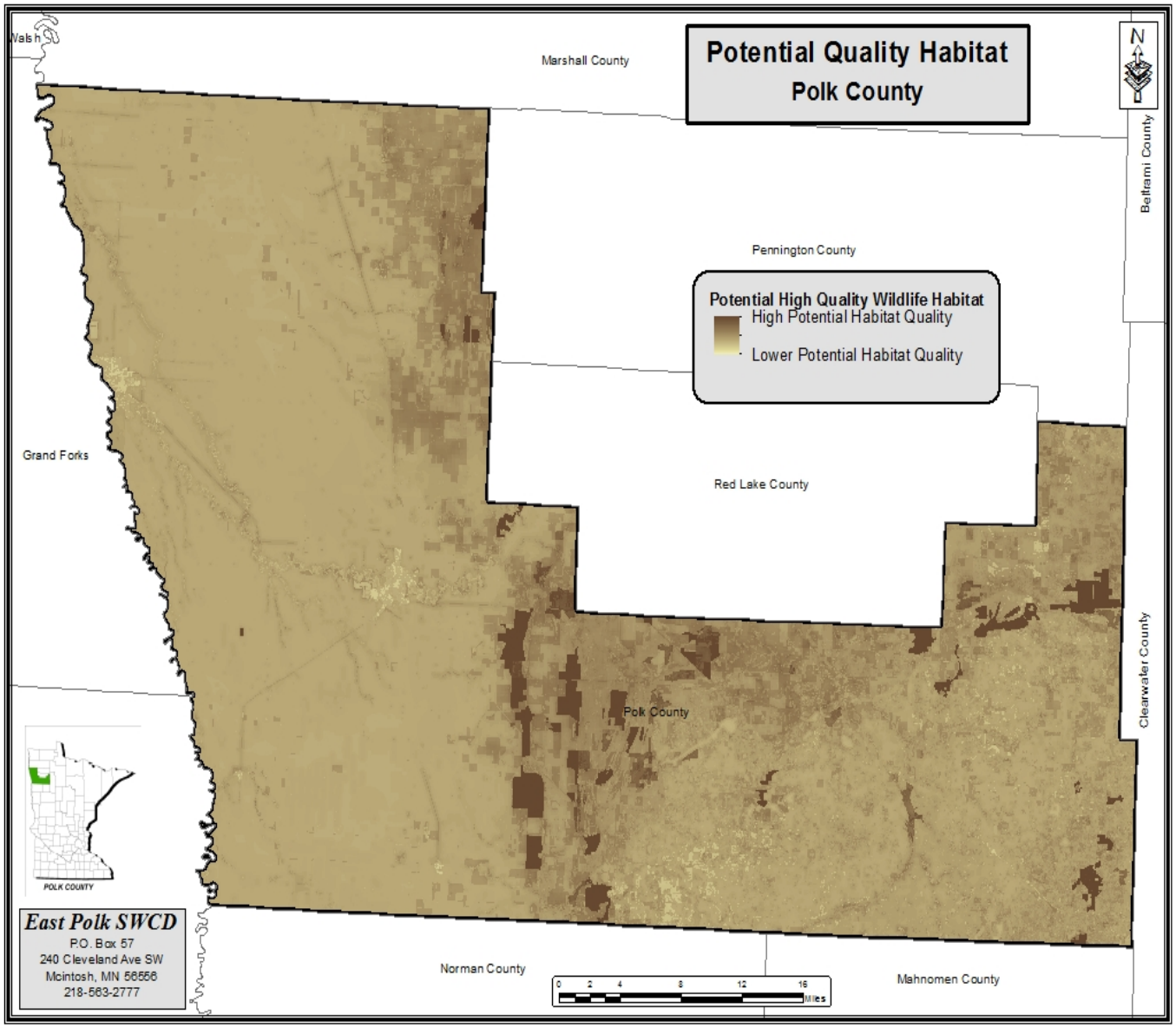
SPECIES	SCIENTIFIC NAME	TYPE	STATUS
A Caddisfly	*Limnephilus secludens*	insect	endangered
A Caddisfly	*Anabolia ozburni*	insect	special concern
A Jumping Spider	*Pelegrina arizonensis*	spider	special concern
A Triaenode Caddisfly	*Triaenodes flavescens*	insect	special concern
Annual Skeletonweed	*Shinnersoseris rostrata*	vascular plant	threatened
Assiniboia Skipper	*Hesperia assiniboia*	insect	endangered
Baird's Sparrow	*Ammodramus bairdii*	bird	endangered
Beach Heather	*Hudsonia tomentosa*	vascular plant	threatened
Beaked Spikerush	*Eleocharis rostellata*	vascular plant	threatened
Black Sandshell	*Ligumia recta*	mussel	special concern
Blanketflower	*Gaillardia aristata*	vascular plant	special concern
Blunt Sedge	*Carex obtusata*	vascular plant	special concern
Burrowing Owl	*Athene cunicularia*	bird	endangered
Chestnut-collared Longspur	*Calcarius ornatus*	bird	endangered
Clustered Broomrape	*Orobanche fasciculata*	vascular plant	threatened
Creek Heelsplitter	*Lasmigona compressa*	mussel	special concern
Creeping Juniper	*Juniperus horizontalis*	vascular plant	special concern
Dakota Skipper	*Hesperia dacotae*	insect	endangered
Drummond's Campion	*Silene drummondii* ssp. *drummondii*	vascular plant	special concern

SPECIES	SCIENTIFIC NAME	TYPE	STATUS
Eastern Spotted Skunk	*Spilogale putorius*	mammal	threatened
Felwort	*Gentianella amarella*	vascular plant	special concern
Few-flowered Spikerush	*Eleocharis quinqueflora*	vascular plant	special concern
Fluted-shell	*Lasmigona costata*	mussel	threatened
Franklin's Gull	*Leucophaeus pipixcan*	bird	special concern
Ghost Tiger Beetle	*Cicindela lepida*	insect	threatened
Goblin Fern	*Botrychium mormo*	vascular plant	threatened
Gray Ragwort	*Packera cana*	vascular plant	endangered
Great Plains Toad	*Anaxyrus cognatus*	amphibian	special concern
Greater Prairie-chicken	*Tympanuchus cupido*	bird	special concern
Hair-like Beak Rush	*Rhynchospora capillacea*	vascular plant	threatened
Hall's Sedge	*Carex hallii*	vascular plant	special concern
Handsome Sedge	*Carex formosa*	vascular plant	endangered
Indian Ricegrass	*Achnatherum hymenoides*	vascular plant	endangered
Lake Sturgeon	*Acipenser fulvescens*	fish	special concern
Lark Sparrow	*Chondestes grammacus*	bird	special concern
Least Weasel	*Mustela nivalis*	mammal	special concern
Loggerhead Shrike	*Lanius ludovicianus*	bird	endangered
Louisiana Broomrape	*Orobanche ludoviciana* var. *ludoviciana*	vascular plant	threatened
Marbled Godwit	*Limosa fedoa*	bird	special concern
McCalla's Willow	*Salix maccalliana*	vascular plant	special concern
Mudpuppy	*Necturus maculosus*	amphibian	special concern
Nelson's Sparrow	*Ammodramus nelsoni*	bird	special concern
Northern Gentian	*Gentiana affinis*	vascular plant	special concern
Northern Single-spike Sedge	*Carex scirpoidea*	vascular plant	special concern
Pale Moonwort	*Botrychium pallidum*	vascular plant	special concern
Plains Pocket Mouse	*Perognathus flavescens*	mammal	special concern
Plains Reedgrass	*Calamagrostis montanensis*	vascular plant	special concern
Poweshiek Skipperling	*Oarisma poweshiek*	insect	endangered
Prairie Moonwort	*Botrychium campestre*	vascular plant	special concern
Prairie Vole	*Microtus ochrogaster*	mammal	special concern
Ram's Head Orchid	*Cypripedium arietinum*	vascular plant	threatened
Regal Fritillary	*Speyeria idalia*	insect	special concern
Sandy Tiger Beetle	*Cicindela limbata nympha*	insect	endangered
Sea Naiad	*Najas marina*	vascular plant	special concern
Short Ray Fleabane	*Erigeron lonchophyllus*	vascular plant	threatened
Short-eared Owl	*Asio flammeus*	bird	special concern
Small White Lady's-slipper	*Cypripedium candidum*	vascular plant	special concern
Small-leaved Pussytoes	*Antennaria parvifolia*	vascular plant	special concern
Spike Oat	*Avenula hookeri*	vascular plant	special concern
Spiral Ditchgrass	*Ruppia cirrhosa*	vascular plant	special concern
Sprague's Pipit	*Anthus spragueii*	bird	endangered
St. Lawrence Grapefern	*Botrychium rugulosum*	vascular plant	special concern
Sterile Sedge	*Carex sterilis*	vascular plant	threatened

SPECIES	SCIENTIFIC NAME	TYPE	STATUS
Trumpeter Swan	*Cygnus buccinator*	bird	special concern
Twig Rush	*Cladium mariscoides*	vascular plant	special concern
Western Prairie Fringed Orchid	*Platanthera praeclara*	vascular plant	endangered
White Adder's Mouth	*Malaxis monophyllos* var. *brachypoda*	vascular plant	special concern
Whorled Nutrush	*Scleria verticillata*	vascular plant	threatened
Wilson's Phalarope	*Phalaropus tricolor*	bird	threatened
Yellow Rail	*Coturnicops noveboracensis*	bird	special concern

Habitat Quality

The following Potential Quality Habitat map and Environmental Benefit Index map of Polk County will be used to identify areas of potential high quality wildlife habitat and greatest conservation benefits.


Potential Quality Habitat
Polk County
N
Walsh
Marshall County
Beltrami County
Pennington County
Potential High Quality Wildlife Habitat
High Potential Habitat Quality
Lower Potential Habitat Quality
Grand Forks
Red Lake County
Polk County
Clearwater County
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
Norman County
Mahnomen County
0 2 4 8 12 16
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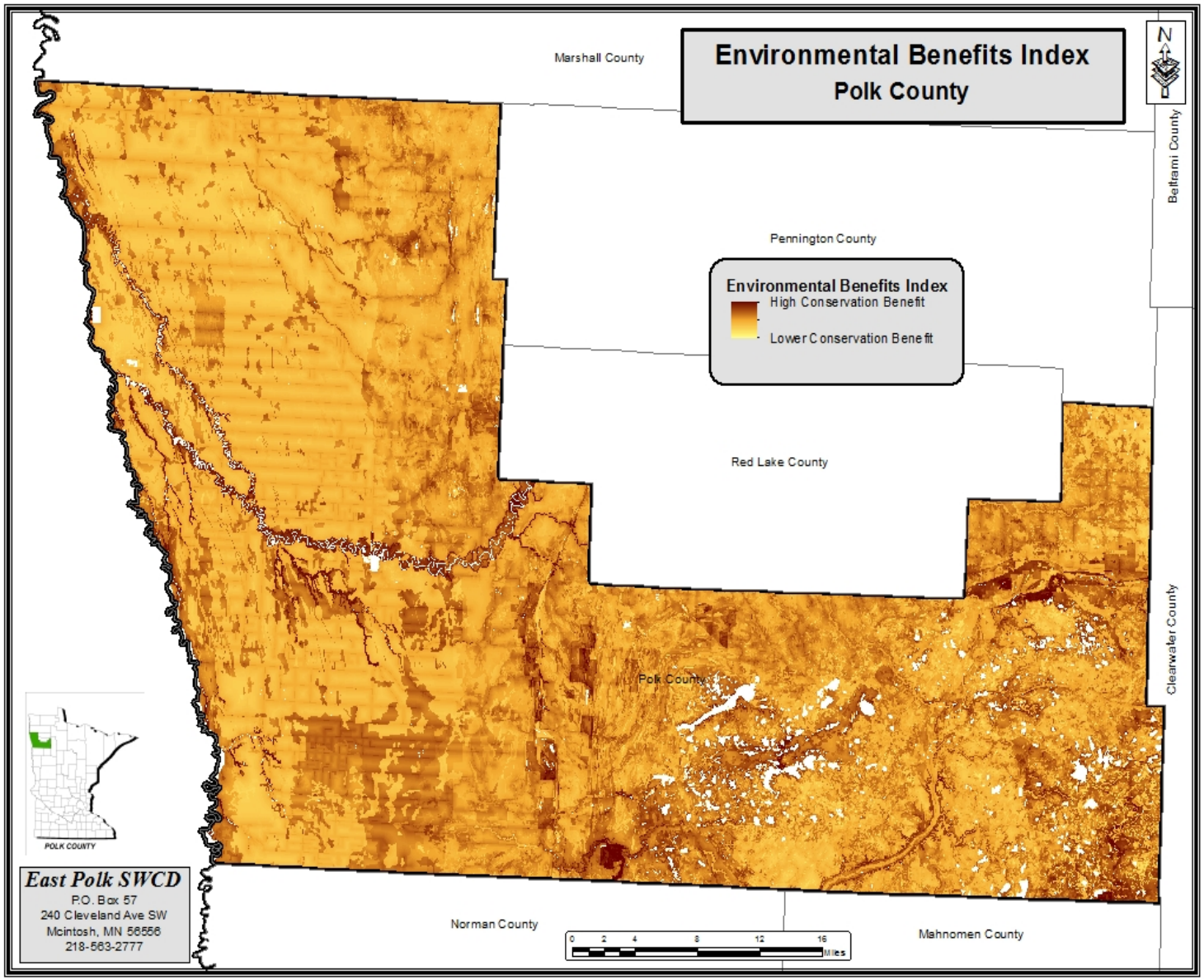

Environmental Benefits Index
Polk County
N
Marshall County
Beltrami County
Pennington County
Environmental Benefits Index
High Conservation Benefit
Lower Conservation Benefit
Red Lake County
Clearwater County
Polk County
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
Norman County
Mahnomen County
0 2 4 8 12 16
Miles

Exotic and Invasive Species Management

Polk County Local Water Management Plan will identify any new or yet to date undiscovered exotic and invasive species for prevention and management practices.

Terrestrial Invasive Species

Noxious weeds have and are becoming prolific in areas of Polk County. Canada, plumeless thistle, spotted knapweed and leafy spurge, for example are very successful at establishing themselves within the county. Wild parsnip is starting to appear in the southern part of the County.

Polk County Cooperative Weed Management Area

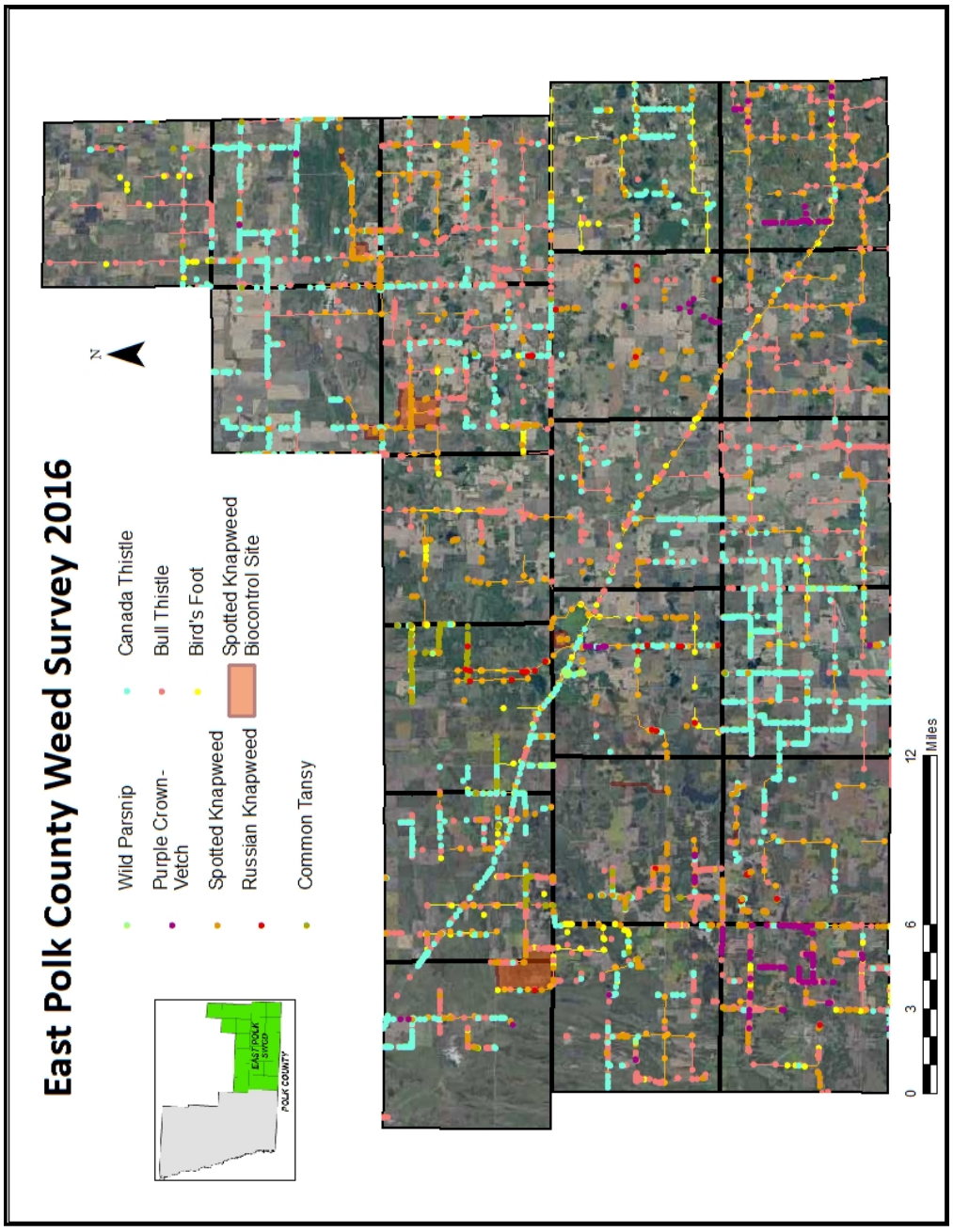
Chaired by Polk County Agricultural and Drainage Inspector, Jody Beauchane, agencies including the Minnesota Department of Natural Resources, , East and West Polk County Soil and Water Conservation Districts, U.S. Fish and Wildlife Service, Minnesota Extension, Farm Service Agency, The Nature Conservancy, and Minnesota Department of Transportation have joined to form the Polk County Cooperative Weed Management Area (PCCWMA). The purpose of the PCCWMA is to work cooperatively to reduce the economic and environmental impacts that invasive plant species have on lands in the County. Representatives from these agencies are focusing on cooperative partnerships with policies, funding opportunities and time committed to reduce invasive weed species in Polk County. The overall objectives are on public education and mapping and control of invasive species with the specific goal to prevent, reduce and eliminate weeds through the use of chemical, mechanical and biological efforts to achieve success.

Formation of the Polk County Cooperative Weed Management Area (PCCWMA), including the development of a Purpose Statement and the drafting of a Memorandum of Understanding was initiated in 2008. Meetings were held to discuss what each agency was doing in regards to invasive weed management, how collaboration would benefit each agency and the benefits in working more cooperatively to promote control of invasive species. The PCCWMA established *Euphorbia esula* (leafy spurge), *Centaurea stoebe* (spotted knapweed), thistle species, and Typha spp. (cattails) as priority species. Additionally, secondary plants of concern for the county include *Linaria vulgaris* (common toadflax), *Tanacetum vulgare* (common tansy), *Vicia cracca* (cow vetch), *Coronilla varia* (crown vetch), *Chrysanthemum leucanthemum* (oxeye daisy), *Daucus carota* (Queen Ann's Lace), *Pastinaca sativa* (wild parsnip), *Butomus umbellatus* (flowering rush), *Lythrum salicaria* (purple lossestrife), *Pastinaca sativa* (wild parsnip), and *Hieracium aurantiacum* (Orange Hawkweed).

The Polk County Ag and Drainage Inspector reports noxious weed acreages controlled by Polk County along county and state roads have increased for the sixth year in a row. In 2008, the increase is largely due to a $12,000 grant received from the U.S. Fish and Wildlife that allowed Polk County to go beyond its normal budgeted amount. The grant was used to identify, map, and control non-native invasive plant species with an herbicide that leaves a residual behind to

control any new noxious weed seeds that could germinate after an area was initially treated. In 2016 more than 2,268 acres of invasive noxious weeds along county and state roads within Polk County were treated, which increased from the 1,537 acres treated in 2015.

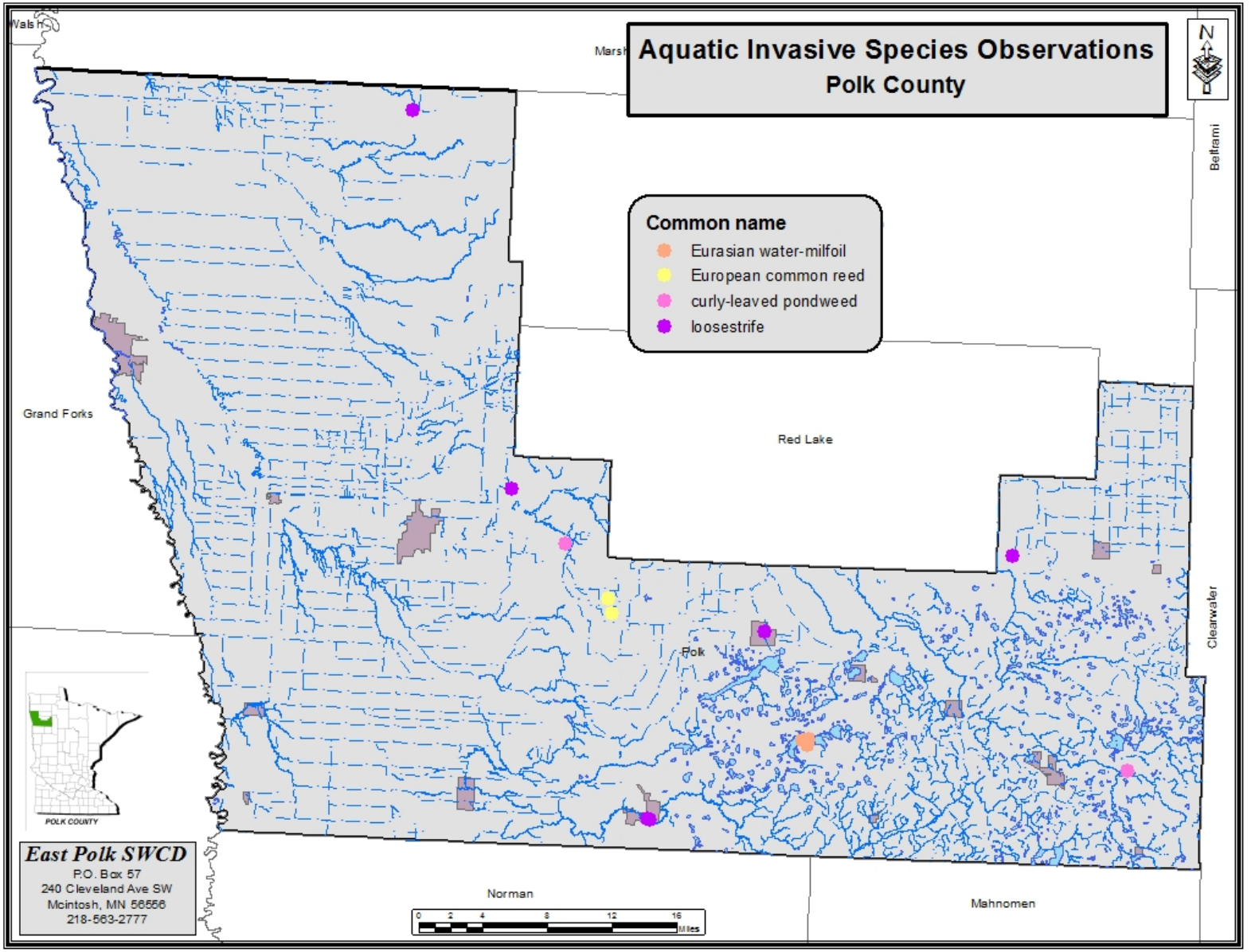
Locations of Invasive Species in East Polk County



Aquatic Invasive Species

Polk County created an Aquatic Invasive Species (AIS) taskforce in 2015. Money was appropriated by the State of Minnesota for AIS prevention efforts in 2014 and beyond, and the taskforce was formed in order to help control the spread of AIS. Polk County received $24,932 in 2014, $55,187 in 2016, and is scheduled to receive $65,563 in 2017 and beyond. The AIS Taskforce has established an AIS plan to help guide the use of the funding in order to have the biggest impact on helping prevent and control the spread of AIS in Polk County.

The spread of AIS (aquatic invasive species) must be controlled because of the threat to our economy, recreational opportunities and fish and wildlife habitats. Once established, invasive species can rarely be eliminated. Currently one lake in Polk County has been identified as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*), Union Lake. Curly Leaf Pondweed (*Potamogeten crispus*) was found in Whitefish Lake in 1998 as part of a fishery survey, and is also present in Union Lake. Purple loosestrife (*Lythrum salicaria*) is found scattered throughout the County in wetlands and lakes. Zebra mussels. Are now present in the Red River of the North. Starry Stonewort (Nitellopsis obtusa) is located nearby Beltrami County and is a major concern. The Chinese Mystery Snail (*Cipangopaludina chinensis malleata*) and the Faucet Snail (*Bithynia tentaculate*) have also been found in neighboring counties.


Aquatic Invasive Species Observations
Polk County
N
Common name
Eurasian water-milfoil
European common reed
curly-leaved pondweed
loosestrife
Walsh
Marsh
Beltrami
Grand Forks
Red Lake
Polk
Clearwater
Norman
Mahnomen
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
0 2 4 8 12 16
Miles

The major goals of the AIS taskforce have been to focus on education, i.e. AIS Essay contest for elementary students and public outreach, inspections and enforcement, special projects, and emergency response. The AIS taskforce hired two seasonal AIS technicians in 2016 and hired three AIS technicians in 2017. The major focus of the AIS technicians to conduct watercraft inspections within Polk County. In 2017 Polk County also purchased two I-LIDS camera systems to help monitor and prevent the spread of AIS at the Union Lake Public Water Access and at the Maple Lake East Shore Public Water Access.

III. Goals and Objectives

Priority Concern #1: Water Quality of Surface Waters of Polk County

The Polk County Local Water Management Plan will focus on protection and enhancement of surface water quality. Specific areas of focus will be:

- Lake Region in the eastern part of the county, with specific focus on the human impacts.
  - Increases in development around smaller, non-recreational lakes and larger wetland complexes should be assessed to determine if adverse impacts have affected the water quality of these smaller bodies of water.
  - For nearly all of the lakes in this ecoregion phosphorus is the limiting factor. Major management efforts related to water quality are directed at limiting the amount of phosphorus loading into the lakes.
  - Sediment loading has also become a major concern to the water quality of the lakes. Proper land use management and implementation of Best Management Practices needs to be analyzed and addressed.
- Surface water in the western part of the county.
  - The cities of East Grand Forks and Grand Forks receives its public water supply from the Red Lake River.
    - The Red Lake River is impaired for turbidity and management efforts should focus on sediment loading into the Red Lake River and its tributaries.
- In addition to the above mentions specific areas of concern for Polk County, The County Board, Watershed Districts and SWCD's will actively pursue efforts to address surface water quality concerns within the county.
- Although surface water is of primary concern for Polk County we will be responsive to the need to monitor and protect our groundwater resources. We will participate to our fullest capacity but state and federal agencies such as Minnesota Department of Health (MDH), Department of Natural Resources(DNR), Minnesota Pollution Control Agency(MPCA), Minnesota Department of Agriculture(MDA), and USGS will need to be the primary source for groundwater protection and management.

Goal: Improve the water quality of rivers and streams from the point they enter Polk County. Our goal is to attain/maintain a fishable/swimmable status of all lakes in the county, with the overall goal for all waters in Polk County to meet or exceed state water quality standards.

To meet this goal Polk County has formed a Water Resource Advisory Committee for those having the authority/interest in water quality to work together to achieve the goal for all waters of Polk County to meet or exceed state water quality standards, and will meet on a quarterly basis.

The County participated in the Sand Hill River Watershed Restoration and Protection Project (WRAP), the Red Lake River 1W1P, and will continue to participate the Red Lake River and Clearwater WRAPs as well as upcoming One Watershed One Plans (IWIP). Once complete, priority will be given to areas identified as a result of the WRAP and /or 1W1P process. The county will also participate in upcoming intensive watershed-wide monitoring studies scheduled to be completed in the future. Additional priority areas will be determined upon based on outcomes of future studies.

Major Watershed Restoration and Protection Studies

Watershed	**Intensive Monitoring Start Year**
Sand Hill River Watershed	2011
Red Lake River Watershed	2012
Grand Marais Creek Watershed	2013
Snake River Watershed	2013
Clearwater RiverWatershed	2014

Until additional targeting efforts are applied the following have been identified as the county's priority project areas based on a collaborative approach to water quality issues, readiness of projects, and willingness of project stakeholders. These and other future projects will be further defined and identified in the SWCD annual planning process.

Priority Areas:

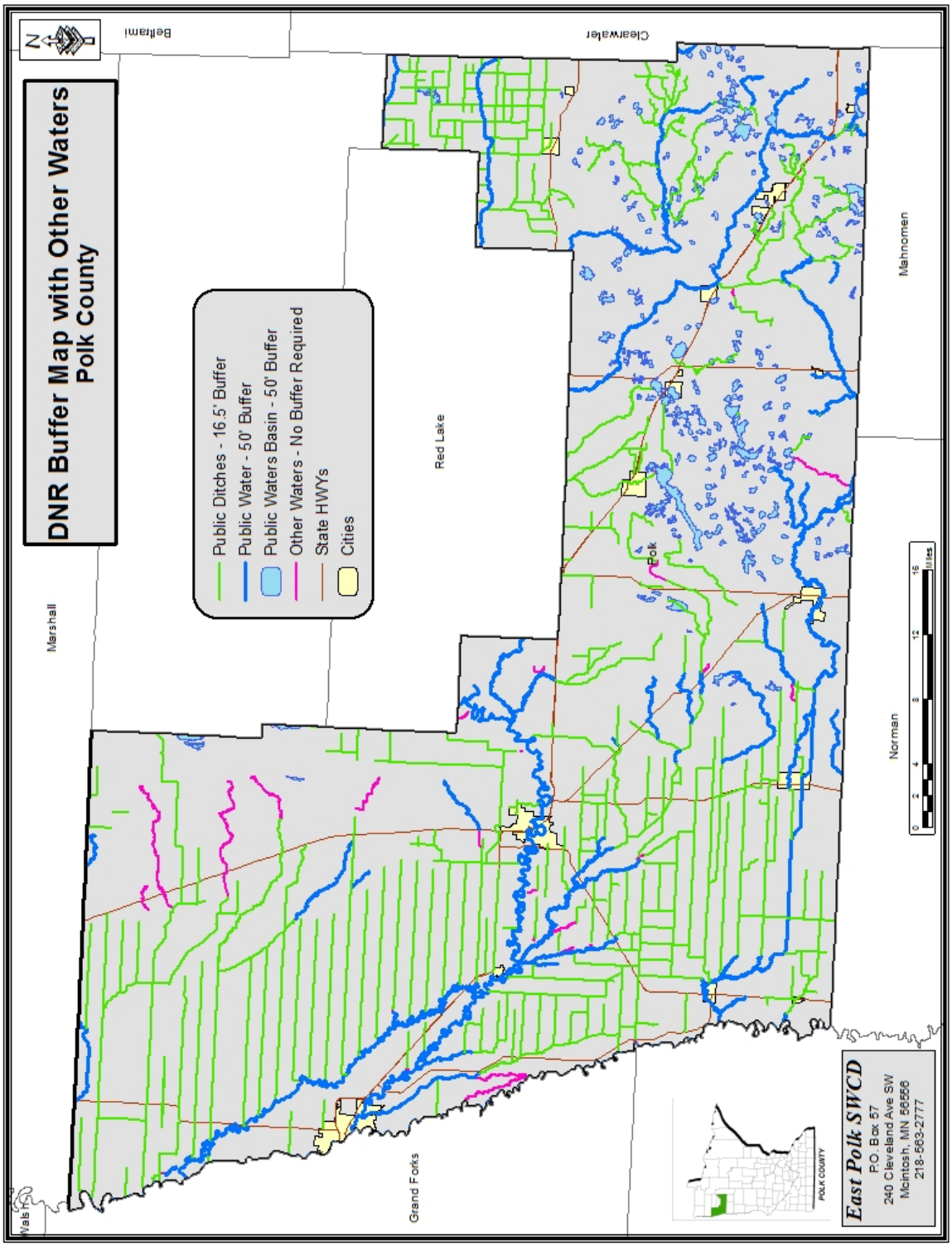
- Projects identified in the Sand Hill River Watershed include the upper reaches of the Sand Hill Watershed
- Erosion of a Watershed Ditch west of the Fertile Airport
-
- Environmental Learning Center stream bank erosion project, and ditch systems that drain within 1 mile of a river or a county ditch system. ~~Other potential projects include the~~
- Maple Lake Diversion Clean Water project
- areas within 1 mile of a well head protection area
- ~~the~~ sealing of unused and unsealed wells
- educate, market and install Ag BMPs based with whole farm planning
- ~~Priorities around the lakes region include~~ educating shoreland owners on lakescaping, working with new developments on natural environmental lakes
- ~~and~~ lakeshed assessments on Union, Sarah and Maple Lake and wetland retention to improve water quality entering Lake Sarah.

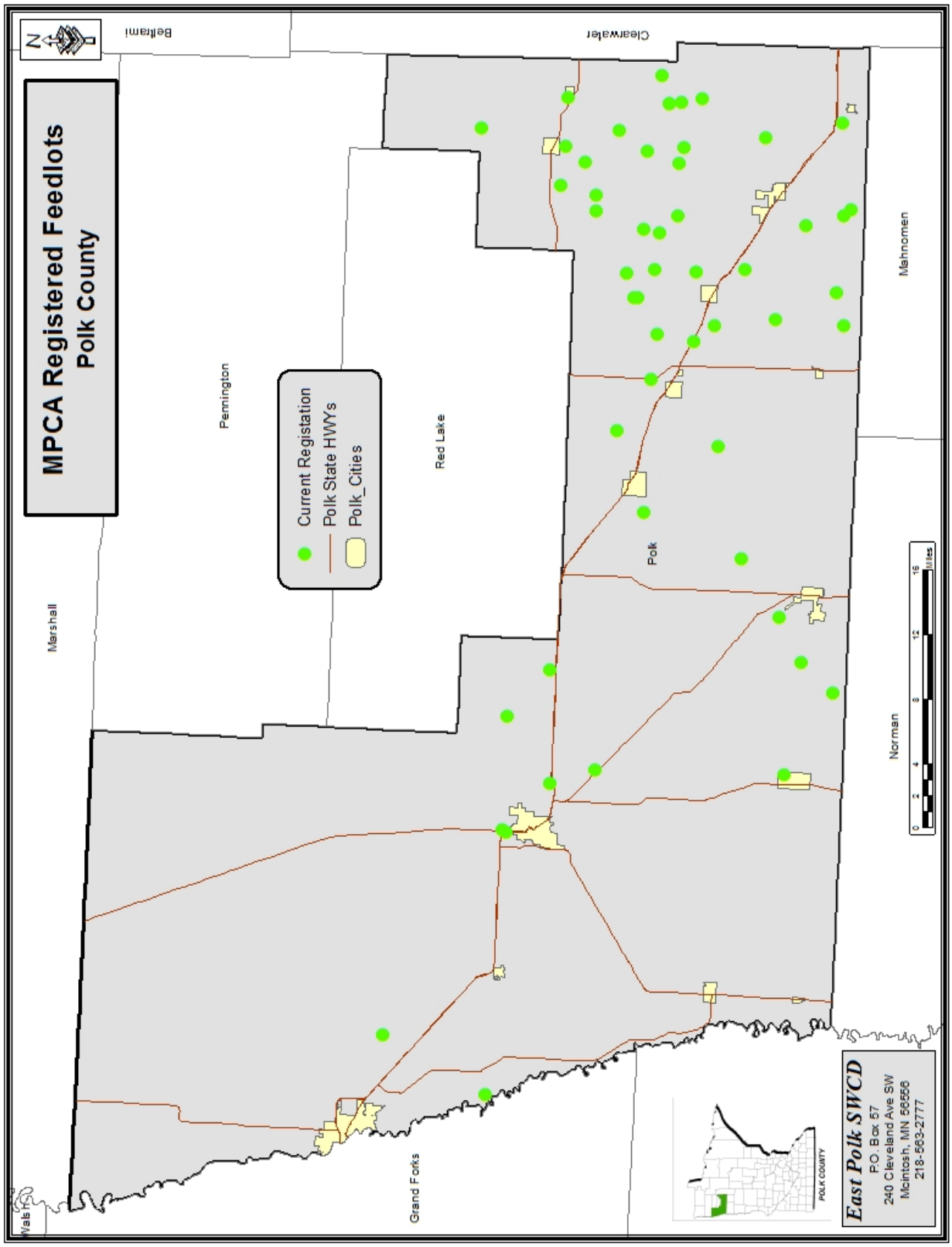
- The following watersheds have completed Watershed Restoration and Protection (WRAP) projects; Sand Hill River, Red Lake, Grand Marias Creek. The SWCD will be actively involved in these processes for watersheds currently underway and for those to be assessed in the future.
- Assist landowners to achieve full compliance related to the Minnesota Buffer Law.

Objective A: Identify areas of agricultural land use, especially in those areas with sensitive ground water and surface water resources for the installation of erosion and sediment control practices to reduce sedimentation into rivers, lakes, and wetlands with priority given to land with a Land Management Plan. Pursue funds to do land management plans to accelerate implementation on needed areas with priority to source water protection. SWCD will help facilitate implemtation of the Buffer Law. County and Watershed Districts will enforce the Buffer Law.

Surface Water

- Action: Install BMP's to address the resource needs such as grassed waterways, sediment control basins, side inlet pipes, minimum tillage or no-till.
- Action: Develop a cost share program, which may supplement existing programs.
- • Action: Provide financial support by seeking grant, Ag BMP loans, or working with agency/ special group partners (example such as NRCS, Deer Hunters Assoc, Ducks Unlimited, Pheasants Forever, and Turkey Federation).
- Action: Target areas for land retirement programs into RIM, CRP, WRP, walk-in- lands, wetland banking, or other programs available.
- Action: Apply targeting tool to identify priority project areas (PTMapp or HSPF
- models).
- Action: Pursue and promote the restoration of wetlands, particularly large wetlands that have been drained or farmed-through. Ditches can be plugged, but sediment should also be removed from the wetlands for a full restoration. Work with the Detroit Lake USFWS Wetlands Office when and where possible. A lack of base flow has been identified as a stressor for many of the biological and low dissolved oxygen impairments in the Red Lake River, Clearwater River, and Grand Marais Creek watersheds.
- Action: Work with the USFWS to complete projects that can simultaneously benefit water quality and habitat.
- Action: Reduce pollutant loads to Cameron Lake. Explore options for restoration of the lake.
- Action: Provide technical assistance to establish buffer, conservation
- Action: Conduct sub subsurface sewage treatment system (SSTS) inventory and upgrades as needed on priority lakes: Maple, Union and Sarah with the potential to expand to other recreation and natural environment lakes


DNR Buffer Map with Other Waters
Polk County
Public Ditches - 16.5' Buffer
Public Water - 50' Buffer
Public Waters Basin - 50' Buffer
Other Waters - No Buffer Required
State HWYs
Cities
Beltrami
Clearwater
Mahnomen
Red Lake
Polk
Marshall
Norman
Grand Forks
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
McIntosh, MN 56556
218-563-2777


MPCA Registered Feedlots
Polk County
N
Beltrami
Clearwater
Pennington
Red Lake
Mahnomen
Marshall
Polk
Norman
Grand Forks
Current Registation
Polk State HWYs
Polk_Cities
0
2
4
8
12
16
Miles
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56566
218-563-2777

- **Objective B:** Maintain and assess the water quality of rivers, and lakes.
- Action: Continue to support the Red River Basin River Watch Program.
- Action: Continue participation in the Citizen Stream Monitoring Program.
- Action: Continue participation in the Lake Level Program on designated
- lakes.
- Action: Continue MNDNR observation well readings.
- Action: Continue citizens' rainfall monitoring program.
- Action: Set up lake monitoring programs.
- Action: Assist in implementing the Lake Improvement Districts lake plans.

Action: Implement the Watershed District plans.
Action: Implement and update the County Comprehensive Plan

Objective C: Continue to assist in the development of Watershed Restoration and Protection Project (WRAP) including TMDL's for waters listed as impaired and Protection Plans for surface waters not impaired.

- Action: Use resources to assist with and confirm listed waters on the TMDL impaired list.
- Action: Develop a water quality monitoring program.
- Action: Pursue grants and funding opportunities that will support the county's surface water protection and improvement efforts.
- Action: Once TMDL Implementation Plans are developed, high prioritize their implementation.
- Action: Assist Watershed Restoration and Protection Strategies as they are completed, and assist with implementing the objectives.

Objective D: Promote and educate the citizens of Polk County about the wise use of our natural resources as it pertains to water quality.

- Action: Participate at the Polk County fair with educational displays.
- Action: Participate in presentations to schools, River Watch, agency meetings, and other educational events.
- Action: Put out timely news releases and newsletters.
- Action: Conduct tours and demonstrations.

Action: Pursue grant funding for educational workshops for Buffer Law implementation, Lakescaping, etc.
Action: Hold a lakescaping workshop for the Maple/Union/Sarah area.

Objective E: Polk County has 77 feedlots that are registered. Many of these feedlots are located next to rivers, lakes or wetlands that may have the potential to impact water quality. Polk County has an approved MPCA County Feedlot Program Delegation Agreement Work Plan

- Action: Conduct site visits and inspection as required in the County Feedlot Plan by the
- Polk County Feedlot Officers,.
  Action: Provide landowners information on feedlot registration, permitting, regulations, and rule requirements.
- Action: Work with feedlot operators to ensure compliance with program rules using
- education, technical assistance and enforcement when necessary.

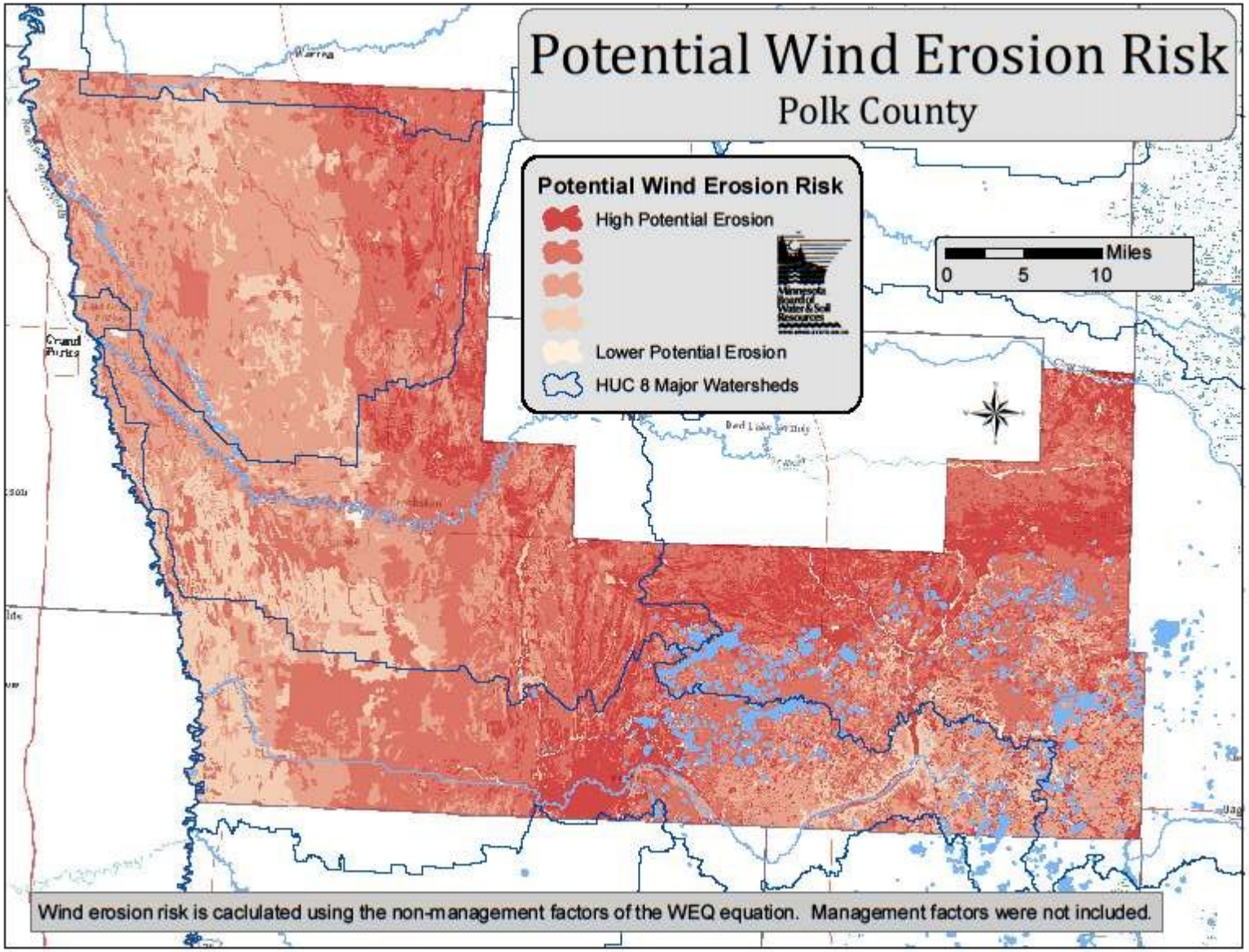
Action: Seek grants or cost share for financial assistance to correct issue with priority given to riparian lots, and high priority to those on impaired waters.

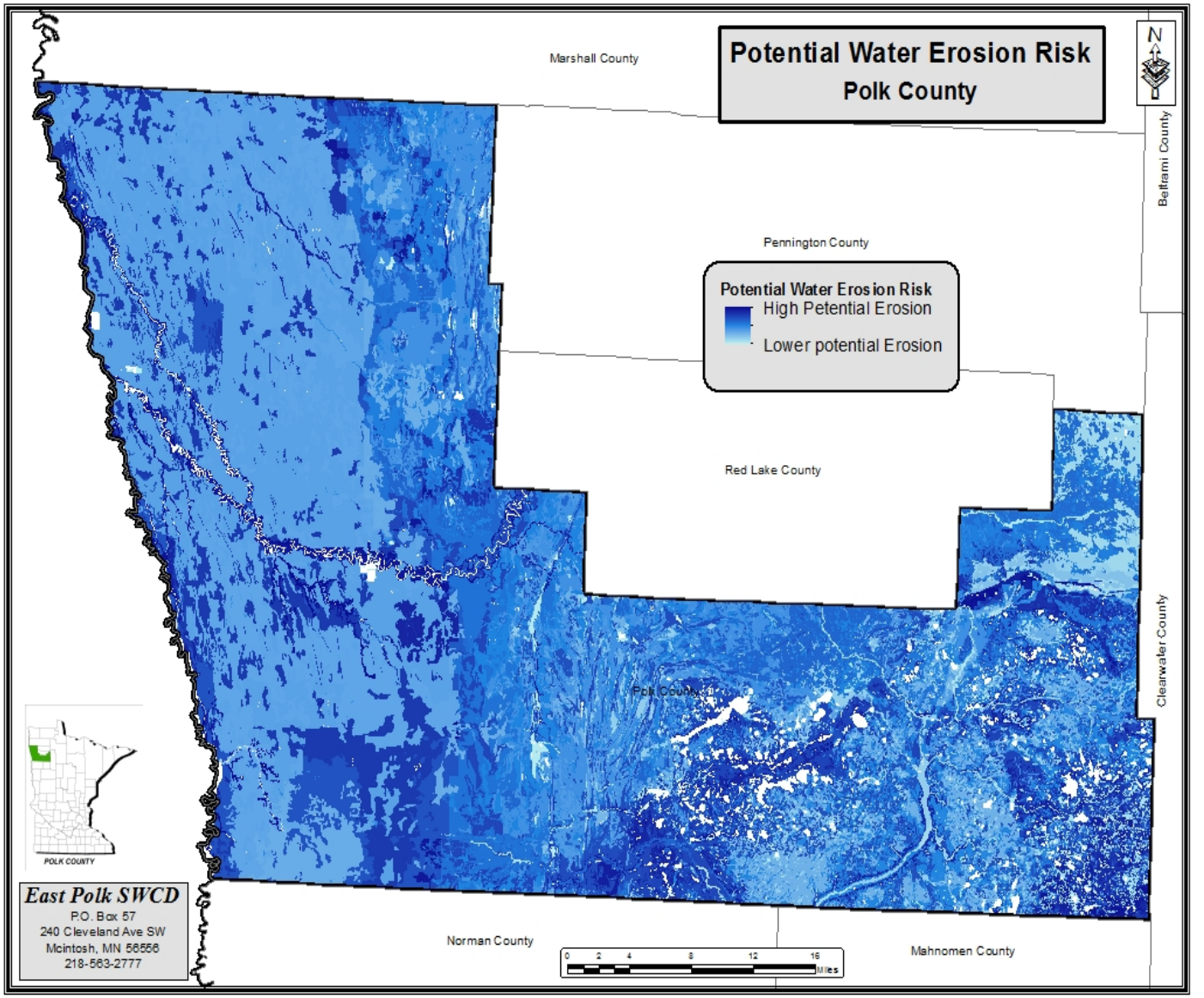
- **Objective F:** Management of the Inner Emergency Response Area and Outer Source Water Management Areas. The inner and outer source water management areas primarily encompass the Red Lake River Watershed.

    - **Action: The East Grand Forks inner and outer surface water assessment areas will be prioritized to:**
        - Improve surface water quality
        - Reduce turbidity and TSS levels
        - Reduce runoff, soil erosion, and sedimentation
        - Install riparian buffers along streams and ditches
        - Support land use controls and decisions that result in surface water protection.
        - Inventory and inspect SSTS.
        - Perform maintenance or upgrades of SSTS.
        - Promote education of proper septic maintenance
        - Support farming best management practices for nutrient reduction.
        - Promote feedlot inspection compliance
        - Habitat, Riparian, erosion and stormwater control projects.
        - Target areas for land retirement programs into RIM and CRP
        - Utilize Source Water Assessment Areas to assess needs and changes in land use (zoning and development ordinances, and enrollment in conservation programs) to protect surface water resources.
        - Install BMP's to address the resource needs such as grassed waterways, sediment control basins, side inlet pipes, minimum tillage or no-till.
        - Seek funding to provide financial incentives or cost share for the implementation of BMP's including cover crops, conservation tillage, nutrient management, forest stewardship, establishment of perennial vegetation and other protective measures in identified priority areas.
        - Continue promotion and collection of household hazardous wastes.

Potential Wind and Water Erosion Risk

The following maps will be referred to provide the county with baseline information for prioritization of efforts when addressing water concerns related to sediment and turbidity.


Potential Wind Erosion Risk
Polk County
Potential Wind Erosion Risk
High Potential Erosion
Lower Potential Erosion
HUC 8 Major Watersheds
Miles
0
5
10
Wind erosion risk is caclulated using the non-management factors of the WEQ equation. Management factors were not included.


Potential Water Erosion Risk
Polk County
Marshall County
Beltrami County
Pennington County
Red Lake County
Clearwater County
Norman County
Mahnomen County
Potential Water Erosion Risk
High Petential Erosion
Lower potential Erosion
POLK COUNTY
East Polk SWCD
P.O. Box 57
240 Cleveland Ave SW
Mcintosh, MN 56556
218-563-2777
0 2 4 8 12 16
Miles

Priority Concern #2: Flood Damage Reduction/Water Quantity

Due to the fluvial geomorphic characteristics of the Red River of the North Basin, Polk County is subject to frequent flooding. Some factors such as topography and increase precipitation are unmanageable, but other factors such as flood plain encroachment, channelization of waterways, land use practices and effective private drainage into public systems, are factors that can be assessed for *Best Management Practices.*

- Polk County Local Water Management Plan will focus on the quantity of water passing through the County and its associated watersheds by inventorying, assessing and evaluating the drainage infrastructure.

Goal 1:

Manage waters in Polk County in a manner that reduces flood damages within the County as well as the Red River Basin. Goals that have been established and will be recognized by Polk County are:

1)The Red River Basin Commission 20% Flow Reduction Strategy which indicate a 35% peak flow reduction on the Sand Hill River at Climax and a 35% peak flow reduction on the Red Lake River at Crookston. To meet these goals Polk County will need to coordinate its efforts with other counties and watershed districts to attain these peak flow reduction in the watersheds shared with Polk County.

2) The Flood Damage Reduction Work Group Mediation Agreement which include but not limited to:

Prevent damage to farm structures, homes, and communities.

a. Promote the construction of farmstead ring dikes built to a minimum of 2 feet of freeboard over the flood of record, or 1 foot above the administrative 100-year flood, whichever is greater.

b. Promote the construction of community setback levees and floodwalls built to the flood of record plus uncertainty (3 feet) or the 100-year flood plus uncertainty, whichever is greater.

c. Promote the acquisition and permanent removal of flood-prone structures and establishment of greenways within the 100-year flood plain.

d. Accelerate flood insurance studies, flood plain remapping and hydraulic/hydrologic studies in poorly defined or unmapped areas.

e. Accelerate comprehensive watershed and systems approaches to basin management.

f. Discourage the development of structures within the 100-year flood plain, with the exception of those approved in a community's flood plain ordinances.

3) Reduce damage to farmland by:

a. Providing protection against a ten-year summer storm event for intensively farmed agricultural land;

b. Maintaining existing levels of flood protection when consistent with a comprehensive watershed management plan; and
c. Providing a higher level of protection, e.g., 25-year event, when feasible at a minimal incremental cost.

Until additional targeting efforts are applied the following have been identified as the county's priority project areas based on a collaborative approach to water quantity issues, readiness of projects, and willingness of project stakeholders. These and other future projects will be further defined and identified in the SWCD annual planning process.

Priority Areas: validate that all ditch systems are functioning properly with adequate culvert size, and proper BMP's associated with that ditch system, be it a private, county or watershed ditch. Make sure that absentee landowners are maintaining the natural water courses so water movement isn't impeded. Address water impoundments or any wetland improvements or dikes that hold water back so it does not alter the drainage system or change the water table so it will have an adverse affect on neighboring property, multi-purpose drainage assessments, and wetland restoration through the state banking program to hold back water.

~~1)~~ **Objective A:** Ensure that county, township, watershed and private ditch systems adequately address the drainage needed to support agriculture without negatively impacting flooding, water quality and other natural resources, as well as economic impacts to the infrastructure of Polk County.

- Action: Establish design standards based on current technological information for the repair, maintenance, improvement, and establishment of agricultural drainage systems.
- Action: Determine if ditch systems are of adequate size.
- Action: Identify needed BMP's such as buffer strips and side inlet pipes.
- Action: Enforce Buffer Law with required buffers or approved alternative practices
- Action: Assess and modify, if needed, Polk County ditch rules and ordinances.
- Action: Assess and modify, if needed Polk County ditch and culvert permitting.
- Action: Assess adequacy of the drainage infrastructure.
- Action: Conduct a culvert inventory.

Action: Identify and map private ditch systems to better understand water movement within the ditch system and county.

-
- Action: Work with Watershed Districts on proper permitting for tiling on private land.
- Action: Address the need for beaver control in public and private ditch systems.
- Action: Implement new technologies in ditch and drainage systems and maintenance as they come available.
    - Seek funding for 2-stage ditch design for ditches that are scheduled/proposed for maintenance/cleaning/improvement.

~~2)~~ **Objective B:** Identify key areas within the County that are prone to flooding and implement proper actions to address flood prevention.

- Action: Use targeting tools to prioritize.
- Action: Establish BMP's that will reduce and/or slow down water movement through the County without adding to flooding.
- Action: Identify site for water retention through land retirement programs such as the RIM/WRE or Agricultural Wetland Banking programs.
- Action: Carry out goals and objectives in the Red Lake River 1W1P, Sand Hill River
- Watershed Plan, Middle-Snake-Tamarac Watershed Plan, the Red Lake Watershed Plan, and other state/local plans.

Action: Seek funding to assist landowners in flooded areas of the County; this could include MN Recover funds, emergency funding and FEMA funding.

Priority Concern #3: Groundwater

Objective A: Protect drinking water supply management areas (DWSMAs) to maintain, enhance and improve the quality of public and private drinking water supplies

- Action: Provide financial support to seal priority wells. Priority will be given to those meeting the State Cost Share priority guidelines, and/or have the potential to impact aquifers.
  - Action: Provide technical assistance to public water suppliers developing and implementing wellhead or source water protection plans.
  - Action: Conduct unused, unsealed well inventory
  - Action: Provide a variety of education on both public wellhead protection areas and the protection and management of private wells and well areas to city residents, farms and businesses regarding specific actions they can take to protect drinking water.
  - Action: Conduct sub subsurface sewage treatment system (SSTS) inventory and upgrades as needed for vulnerable Drinking Water Supply Management Areas (DWSMAs)
  - Action: Encourage landowners to conduct proper septic system maintenance at a minimum of every three years.
  - Action: Utilize Wellhead Protection Plans to assess needs and changes in land use (zoning and development ordinances, and enrollment in conservation programs) to protect groundwater resources.

  - Action: Seek funding to provide financial incentives or cost share for the implementation of BMP's including cover crops, conservation tillage, nutrient management, forest stewardship, establishment of perennial vegetation and other protective measures in identified priority areas.
  - Action: Continue promotion and collection of household hazardous wastes.

- Action: Identify vulnerable wellhead protection areas as priority areas for BMP incentive programs

- Action: Target vulnerable wellhead protection areas for land retirement programs into RIM and CRP.
- Action: Encourage and assist LGU's in developing ordinances to limit land uses that threaten groundwater quality and quantity.
- Action: Participate in the development of a county geologic atlas (in the event one will be developed).
- Inventory gravel pits via GIS, permit review and phone interviews with landowners and/or aggregate representatives to determine the reclamation status of gravel pits throughout the county.
- Hold one public outreach event to educate/inform owners about the appropriate methods of reclaiming/restoring a gravel pit
- Action: Relocate or change the design of proposed storm water infiltration projects in high vulnerability DWSMAs

Objective B: Efficient use of groundwater resources for agricultural irrigation

- Action: Increase local awareness of available resources and technology for soil moisture monitoring and management of irrigated land and encourage their utilization.
- Partners: SWCD, NRCS, MDA
- Action 2. Work with landowners and producers to track and maintain planting, weather and irrigation data throughout the growing season to evaluate crop water use and scheduling of water applications.
- Action 3: Encourage water conservation through use of low-pressure irrigation systems to conserve groundwater in the county.

Priority Concern #4: Preservation and Enhancement of Polk County Natural Resources

Polk County is concerned with the preservation and enhancement of its natural resources. The geology of Polk County is divided into 3 distinct areas; the glacial-lake plain, glacial lake washed till plain and glacial moraine region. These major areas, because of their size, unique geographical features, and wide diversity of natural resources are of significant benefit to the area and citizens.

- Polk County in cooperation with other local, state, and federal agencies will work to restore, enhance and protect these areas through programs and projects.

Goal: Participate in the restoration, conservation, and protection of key areas providing unique ecological values and recreational opportunities.

Until additional targeting efforts are applied the following have been identified as the county's priority project areas based on a collaborative approach to restore, protect and enhance natural areas, readiness of projects, and willingness of project stakeholders. These and other future projects will be further defined and identified in the annual planning process.

Priority Areas: Conservation Reserve Program (CRP) acres that will be expiring in upcoming years which are located in the "high conservation potential" areas identified on the EBI map located on page 61. Areas that protect or restore rare natural features as identified in the Minnesota County Biological Survey (MCBS). Areas that require buffers based on the Buffer Law. Priority will also be given to those areas on which a land management plan has been developed to ensure proper conservation and habitat goals are met.

Objective A: Identify, restore, and protect grassland, wetland, and woodland habitats and key natural areas with multiple benefits to Polk County and its Citizens.

- Action: Seek funding opportunities with existing or future land retirement or easement programs, with cooperating partners.
- Action: Minimize land use impacts of potential land use changes by the installation of BMP's.

Objective B: Recognize areas that are unique to the County such as native prairie sites in the glacial beach ridge areas, and wetland areas of the lake region. Utilize Minnesota County Biological Survey (MCBS) Areas of Biodiversity Significance, native plant communities, and key habitats as a resource to identifying appropriate sites.

- Action: Seek funding opportunities with existing or future land retirement or easement programs, with cooperating partners.
- Action: Minimize land use impacts of potential land use changes by the installation of BMP's.

Action: Work with state, federal, and non-profit agencies/organizations on acquisition of strategic parcels.

Objective C: Protect and identify areas of threatened or endangered species

- Action: Promote education on the species that are threatened or endangered.
- Action: Minimize land use impacts of potential land use changes by the installation of BMP's.

Objective D: Preserve high quality wetlands within Polk County for their best functional values.

- Action: Identify wetlands that are of high value for banking credits, easements, flood storage, and wildlife.
- Action: Offer cost share and other incentives to landowners to participate in restoration of wetlands.
- Action: Assist with development of Agricultural Wetland Banking program.

Objective E: Preserve and enhance water quality by enforcing the Buffer Law

- Action: Assist landowner with establishment
- Action: Assist landowners with technical designs of alternative practices
- Action: Enforce non complicance of the Buffer Law

Polk County Local Water Management Plan will identify any new or yet to date undiscovered exotic and invasive plant or animal species for prevention and management practices.

Goal: Reduce invasive species impacts within Polk County.

Until additional targeting efforts are applied the following have been identified as the county's priority project areas based on a collaborative approach to invasive species impacts, readiness of projects, and willingness of project stakeholders. These and other future projects will be further defined and identified in the SWCD annual planning process.

The Polk County AIS Taskforce will continue to meet and focus on preventing and/or limiting the spread of AIS within Polk County.

Priority Areas: Address invasive species along road right-of-ways, private landowner's property, and local state and federal lands, aiming to prevent the spread of terrestrial invasive species. Address aquatic invasive species threats to area lakes and rivers. Monitor infestation of Eurasian Water Milfoil in Union Lake and other AIS. Monitor infestation of Zebra Mussels on the Red River of the North.

Terrestrial Invasive Species

Objective A: Control terrestrial invasive species by prevention, reduction and elimination.

- Action: Map new sites and species occurrence.
- Action: Conduct public education on the invasive species by public meeting, mailings, news releases and newsletters

Action: Work with township boards on township road weed management.

- Action: Seek funding though cooperating partners and grants.

Objective B: Continue support of the Polk County Cooperative Weed Management Area.

- Action: Have a central clearinghouse to compile all data collected.
- Action: Continue to have meetings to keep the PCCWM group active.
- Action: Keep the public informed of the PCCWM group activities.

Aquatic Invasive Species

Objective D: Control aquatic invasive species by prevention, reduction and elimination by utilizing the AIS Taskforce.

- Action: Educate staff and lake associations on aquatic invasive species threats.
- Action: Educate public on reducing aquatic invasive species threats.
- Action: Identify and map aquatic invasive species within county and regional threats.
- Action: Continue the AIS prevention plan for Polk County to help prevent or limit the spread of aquatic invasive species.
- Action: Hire seasonal AIS Technicians to perform watercreaft inspections.
- Action: Explore the benefit/need of decontamination units within Polk County,

Reference Documents and Website Locations

Middle Tamarack Snake Watershed District 10 Year Plan
http://mstrwd.org/about/10-year-plan/

Minnesota Department of Natural Resources, 2006. *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife*, Comprehensive Wildlife Conservation Strategy. Division of Ecological Services, Minnesota Department of Natural Resources.

Minnesota Department of Natural Resources, Lake Finder Website
http://www.dnr.state.mn.us/lakefind/index.html

Minnesota Department of Natural Resources, Rare Species Guide
http://www.dnr.state.mn.us/rsg/index.html

Minnesota Department of Natural Resources List of Known Calcareous Fen Sites (June 30, 2001)

Minnesota Department of Natural Resources, Invasive Species in Minnesota,
http://www.dnr.state.mn.us/invasives/index.html

Minnesota Prairie Conservation Plan
http://www.dnr.state.mn.us/prairieplan/index.html

MPCA Red River Basin Water Quality Plan, 1999
http://www.pca.state.mn.us/water/basins/redriver/wqplan/index.html

Minnesota Pollution Control Agency, Impaired Waters and TMDLs,
www.pca.state.mn.us/water/tmdl/index.html

NRCS Website, Watershed Overview

http://www.mn.nrcs.usda.gov/technical/rwa/Assessments

Red Lake River One Watershed One Plan
http://westpolkswcd.com/1w1p.html

Red Lake River Watershed Farm to Stream Tile Drainage Water Quality Study Final Report, Revision 3 - March 20, 2009
http://www.redlakewatershed.org/projects

Red Lake Watershed District 10-Year Comprehensive Plan, April 2006
http://www.redlakewatershed.org/planupdate

Sand Hill River Watershed Management Plan, May 13, 2011

Summary of Regional Assessment Locations
By Danni Halvorson, IWI

- Heiskary, Steven, and S. McCollor. 1993. Selected Water Quality Characteristics of Minimally Impacted Streams from Minnesota's Seven Ecoregions, Addendum to: Descriptive Characteristics of the Seven Ecoregions in Minnesota. Minnesota Pollution Control Agency.
- Fandrei, G., S.A. Heiskary, and S. McCollor. 1988. Descriptive Characteristics of the Seven Ecoregions in Minnesota. Minnesota Pollution Control Agency.
- Minnesota Pollution Control Agency. 2010. Guidance Manual for Assessing the Quality of Minnesota Surface Waters for Determination of Impairment: 305(b) Report and 303(d) List.

U.S. Geological Survey, Estimated Use of Water in the United States in 2005, By Joan F. Kenny, Nancy L. Barber, Susan S. Hutson, Kristin S. Linsey, John K. Lovelace, and Molly A. Maupin

U.S. Geological Survey, Ground-Water Availability from Surficial Aquifers in the Red River of the North Basin, Minnesota (Reppe 2005).

U.S. Geological Survey, Water-Resources Investigation Report 95-4201, 1996.

Cover Photograph courtesy of Ben Sullivan, July 7, 2011.

IV. Implementation Schedule

Fundamental goals and objectives can be generalized, project's budgets will be further refined as the projects develop.

Priority Concern # 1

Goal: Improve the water quality of rivers and streams from the point they enter Polk County. Our goal is to attain/maintain a fishable/swimmable status of all lakes in the county, with the overall goal for all waters in Polk County to meet or exceed state water quality standards.

Objective A: Identify areas of agricultural land use, especially in those areas with sensitive ground water and surface water resources for the installation of erosion and sediment control practices to reduce sedimentation into rivers, lakes, and wetlands with priority given to land with a Land Management Plan. Pursue funds to do land management plans to accelerate implementation on needed areas with priority to source water protection.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Install BMP's to address the resource needs	Ongoing	SWCD/NRCS	Watershed Districts	Unknown	All
Develop a cost share program	Ongoing	SWCD/NRCS	BWSR	Unknown	All
Provide technical assistance	Ongoing	SWCD/NRCS	Landowners, Watershed Districts	$30,000/ year	All
Provide financial support by seeking grants	Ongoing	SWCD	Watershed Districts, BWSR, Other	Unknown	All
Target areas for land retirement programs	Ongoing	SWCD/NRCS	Watershed Districts, BWSR	Unknown	All
Apply targeting tool to identify priority project areas	Ongoing	SWCD	Watershed Districts, BWSR, NRCS	Unknown	All
Pursue and promote restoration of wetlands	Ongoing	SWCD	BWSR, Watershed Districts, MNDNR,	Unknown	All
Work with USFWS on projects that benefit water quality and habitat	Ongoing	SWCD	County, Watershed Districts, MNDNR	Unknown	All

Reduce pollutant loads into Cameron Lake, explore restoration opportunities	Ongoing	County/MPCA	SWCD, RLWD, MNDNR, City of Erskine	Unknown	
Conduct SSTS inventory & upgrades	Ongoing	County Environmental Services	SWCD	Unknown	All
Provide financial support to seal priority wells	Ongoing	SWCD/NRCS	BWSR	$5,000/ year	All

- **Objective B:** Maintain and assess the water quality of rivers, lakes, and groundwater resources.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Utilize monitoring data to establish an attainable range for water quality	Ongoing	MPCA	Watershed Districts, SWCD, River Watch, MNDNR	Unknown	All
Continue to support the Red River Basin River Watch Program	Ongoing	River Watch (IWI, RLWD)	Watershed Districts	$1,000/year	All
Continue participation in the Citizen Stream Monitoring Program	Ongoing	SWCD	MPCA, Watershed Districts	$2,000/year	RLWD SHRWD
Continue taking water elevation readings on designated lakes	Ongoing	SWCD	Watersheds	$2,000/year	RLWD SHRWD
Continue MNDNR observation well readings	Ongoing	SWCD	MNDNR	$200/year	RLWD
Continue citizens' rainfall monitoring program	Ongoing	SWCD	MNDNR, Citizens	$500/year	All
Set up/continue lake monitoring programs	Ongoing	SWCD	County, SWCD, MPCA MN DNR Shallow Lakes Program	$10,000/year	All
Implement the Lake Improvement Districts lake plans	Ongoing	Lake Improvement District	MPCA, County, SWCD, Watershed Districts, MNDNR	$100/year	RLWD SHRWD

Implement the Watershed District plans	Ongoing	Watershed Districts	County, Watershed Districts, MPCA, Lake Imp. Dist.., SWCD	$100,000/year	All
Implement and update the County Comprehensive Water Plan	Ongoing	County, SWCD	Watershed Districts, MPCA, Lake Imp. District, MNDNR	Unknown	All

- **Objective C:** Assist in the development of Watershed Restoration and Protection Project (WRAP) including TMDL's for waters listed as impaired and Protection Plans for surface waters not impaired.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Use resources to assist with and confirm listed waters on the TMDL impaired list	Ongoing	MPCA, Watershed Districts	SWCD, MNDNR, USFWS, MDH, MDA	$2,000/year	All
Develop a water quality monitoring program	Ongoing	Watershed Districts, MPCA	SWCD	$1,000/year	All
Pursue grants and funding opportunities that will support the county's surface water protection and improvement efforts	Ongoing	SWCD	Watershed Districts, County, MNDNR	$6,000/year	All
Prioritize implementation of the TMDL Implementation Plans	Ongoing	Watershed Districts, MPCA	SWCD, County	Unknown	All
Implement TMDL Implementation Plan and WRAPs Projects	Ongoing	Watershed Districts, MPCA	SWCD, County, MNDNR	Unknown	All

- **Objective D:** Promote and educate the citizens of Polk County about the wise use of our natural resources as it pertains to water quality.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Participate at the Polk County fair with educational displays	Ongoing	SWCD	County, Watershed Districts, MNDNR, River Watch (IWI)	$100/ year	All
Participate in presentations to schools, River Watch, agency meetings, educational events	Ongoing	SWCD	River Watch (IWI), County, Watershed Districts, MNDNR, USFWS	$1,500/year	All
Put out timely news releases and newsletters	Ongoing	SWCD	River Watch (IWI), County, Watershed Districts, MNDNR, USFWS	$1,000/year	All
Conduct tours & demonstrations	Ongoing	SWCD	River Watch (IWI), County, Watershed Districts, MNDNR, USFWS	$1,000/year	All
Pursue grants for educational workshops for buffer implementation, lakescaping, etc	Ongoing	SWCD	County, Watershed Districts	Unknown	All
Hold lakescaping workshop for Union/Lake Sarah/Maple	Ongoing	SWCD	County, Watershed Districts, MNDNR, Lake Imp. Dist.	Unknown	All

- **Objective E:** Polk County has 77 feedlots that are registered. Many of these feedlots are located next to rivers, lakes or wetlands that may have the potential to impact water quality. Polk County has an approved MPCA County Feedlot Program Delegation Agreement Work Plan.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Conduct site visits and inspection as required in the MPCA County Feedlot Program Delegation Agreement Work Plan.	Ongoing	SWCD	MPCA, County, MNDNR	$7,500/year	All
Provide landowners information on feedlot registration, permitting, regulations, and rule requirements	Ongoing	SWCD	MPCA U of M Extension, County, MDA	$7,000/year	All
Provide educational and technical information	Ongoing	SWCD	MPCA U of M Extension, County, MDA	$1,000/year	All
Seek grants or cost share for financial assistance	Ongoing	SWCD	MPCA, MDA	Unknown	All

- **Objective F:** Management of the Inner Emergency Response Area and Outer Source Water Management areas. The inner and outer source water management areas primarily encompass the Red Lake River Watershed.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Prioritize the East Grand Forks inner and outer surface water assessment areas.	Ongoing	City of East Grand Forks	W. Polk SWCD, MDH, MPCA, BWSR, RLWD	Unknown	Red Lake Watershed

Priority Concern #2

Goal: Manage waters in Polk County in a manner that reduces flood damages within the County as well as the Red River Basin. Goals that have been established and will be recognized by Polk County are:

1) The Red River Basin Commission 20% Flow Reduction Strategy which indicate a 35% peak flow reduction on the Sand Hill River at Climax and a 35% peak flow reduction on the Red Lake River at Crookston. To meet these goals Polk County will need to coordinate its efforts with other counties and watershed districts to attain these peak flow reduction in the watersheds shared with Polk County.

2) The Flood Damage Reduction Work Group Mediation Agreement which include but not limited to:

Prevent damage to farm structures, homes, and communities.

a. Promote the construction of farmstead ring dikes built to a minimum of 2 feet of freeboard over the flood of record, or 1 foot above the administrative 100-year flood, whichever is greater.
b. Promote the construction of community setback levees and floodwalls built to the flood of record plus uncertainty (3 feet) or the 100-year flood plus uncertainty, whichever is greater.
c. Promote the acquisition and permanent removal of flood-prone structures and establishment of greenways within the 100-year flood plain.
d. Accelerate flood insurance studies, flood plain remapping and hydraulic/hydrologic studies in poorly defined or unmapped areas.
e. Accelerate comprehensive watershed and systems approaches to basin management.
f. Discourage the development of structures within the 100-year flood plain, with the exception of those approved in a community's flood plain ordinances.

3. Reduce damage to farmland by:

a. Providing protection against a ten-year summer storm event for intensively farmed agricultural land;
b. Maintaining existing levels of flood protection when consistent with a comprehensive watershed management plan; and
c. Providing a higher level of protection, e.g., 25-year event, when feasible at a minimal incremental cost.

- **Objective A:** Ensure that county, township, watershed and private ditch systems adequately address the drainage needed to support agriculture without negatively impacting water quality and other natural resources, as well as economic impacts to the infrastructure of Polk County.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Establish design standards for the repair, maintenance, improvement, and establishment of agricultural drainage systems	3 years	Watershed Districts	Polk County Drainage Authority	$1000/ year	All
Determine if ditch systems are of adequate size	5 years	Watershed Districts	Polk County Drainage Authority	$500/year	All
Identify needed BMP's	5 years	SWCD	Watershed Districts, MNDNR	$500/year	All
Assess and modify, if needed, Polk County ditch rules and ordinances	5 years	County	Watershed Districts	$500/year	All
Assess and modify, if needed Polk County ditch and culvert permitting	3 years	County, Watershed Distr.	Townships	$500/year	All
Assess adequacy of the drainage infrastructure	3 years	County, Watershed Distr.	Townships	$500/year	All
Conduct a culvert inventory	5 years	Watershed Dist.	SWCD	$50,000/year	All
Identify and map private ditch systems to better understand water movement within the ditch system and county	5 years	SWCD	Townships, Landowners	$50,000/year	All
Work with Watershed Districts on proper permitting for tiling on private land	3 years	Watershed Districts	SWCD	$500/year	All
Address the need for beaver control in public and private ditch systems	Ongoing	Townships	SWCD, Watershed Districts, County, MNDNR	$500/year	All

Implementation of new technologies in ditch and drainage systems and maintenance as they come available.	Ongoing	Watershed Districts, SWCD	County	Unknown	All
Seek funding for 2-stage ditch design for on ditches proposed for maintenance/cleaning/improvement	Ongoing	Watersheds, County	SWCD, BWSR	Unknown	All

- **Objective B:** Identify key areas within the County that are prone to flooding and implement proper actions to address flood prevention.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Establishment of BMP's that will reduce and/or slow down water movement through the County	Ongoing	SWCD	NRCS, Watershed Districts, MNDNR, BWSR	$5,000/year	All
Identify site for water retention through land retirement programs such as the RIM/WRP or Agricultural Wetland Banking programs	Ongoing	SWCD	BWSR, NRCS, Watershed Districts, MNDNR	$25,000/year	All
Carry out goals and objectives in Watershed District plans and 1W1P.	Ongoing	Watershed Districts	SWCD	Unknown	All
Seek funding to assist landowners in flooded areas of the County; this could include MN Recover funds, emergency funding and FEMA funding	Ongoing	SWCD	BWSR, NRCS, Watershed Districts, MNDNR	$5,000/year	All

Priority Concern #3: Groundwater

Goal: Protect drinking water supply management areas (DWSMAs) to maintain, enhance and improve the quality of public and private drinking water supplies

- **Objective A:** Protect drinking water supply management areas (DWSMAs) to maintain, enhance and improve the quality of public and private drinking water supplies.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Provide financial support to seal priority wells.	Ongoing	SWCDs, County	MPCA, MDH, BWSR	Unknown	All
Provide technical assistance to public water suppliers developing and implementing wellhead or source water protection plans	Ongoing	MDH	SWCD, BWSR, County	Unknown	All
Conduct unused well inventory	Ongoing	SWCD	MDH, MPCA, County	Unknown	All
Education on public wellhead protection areas and protection and management of private wells to the public	Ongoing	MDH	SWCD, County, MPCA	Unknown	All
Conduct sub-surface sewage treatment system (SSTS) inventory	Ongoing	County	MDH, MPCA, SWCD	Unknown	All
Encourage landowners to perform proper septic system maintenance every 3 years.	Ongoing	County	MDH, MPCA, SWCD	Unknown	All

Utilize Wellhead Protection Plans to assess needs and changes in land use to protect groundwater resources.	Ongoing	SWCD, County	MDH, MPCA, NRCS, MNDNR, Watershed Districts, Cities, BWSR	Unknown	All
Seek funding to provide financial incentives or cost share for the implementation of BMP's	Ongoing	SWCD	Watershed Districts, County, Cities, BWSR	Unknown	All
Continue promotion and collection of household hazardous wastes	Ongoing	County	Cities, Townships	Unknown	All
Identify vulnerable wellhead protection areas as priority areas for BMP incentive programs	Ongoing	SWCD	County, NRCS, Watershed Districts	Unknown	All
Target vulnerable wellhead protection areas for land retirement programs	Ongoing	SWCD	MNDNR, County, BWSR	Unknown	All
Encourage and assist LGU's in developing ordinances to limit land uses that threaten groundwater.	Ongoing	MDH	MPCA, SWCD, County	Unknown	All
Participate in the development of a county geologic atlas	Ongoing	County	MDH, IWI, USGS, MNDNR, SWCD, Watershed Districts	Unknown	All
Inventory gravel pits to determine the reclamation status of gravel pits throughout the county	Ongoing	County	MNDNR, SWCD, Townships	Unknown	All

Hold public outreach event to educate the public on reclaiming and restoring gravel pits	Ongoing	County	MNDNR, SWCD, Townships, NRCS	Unknown	All
Relocate or redesign proposed storm water infiltration project in high vulnerability DWSMAs	Ongoing	MPCA, MDH	County, Cities, Townships	Unknown	All

- **Objective B:** Efficient use of groundwater resources for agricultural irrigation

Increase local awareness of resources and technology for soil moisture monitoring and management	Ongoing	MDH	SWCD, NRCS, MDA, MNDNR	Unknown	All
Work with landowners to track and maintain planting, weather and irrigation data throughout growing season	Ongoing	MDH	SWCD, NRCS, MDA, MNDNR	Unknown	All
Encourage water conservation through use of low-pressure irrigation systems to conserve groundwater	Ongoing	MNDNR	MDH, MDA, NRCS, SWCD	Unknown	All

Priority Concern #4

Goal: Participate in the restoration, conservation, and protection of key areas providing unique ecological values and recreational opportunities and reduce invasive species impact in the county.

- **Objective A:** Identify, restore, and protect grassland, wetland, and woodland habitats and key natural areas with multiple benefits to Polk County and its Citizens.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Seek funding opportunities with existing or future land retirement or easement programs, with cooperating partners	Ongoing	SWCD	NRCS, Working Lands Initiative Local Technical Team (LTT), MNDNR, USFWS, TNC	$25,000/year	All
Minimize land use impacts of potential land use changes by the installation of BMP's	Ongoing	SWCD0	NRCS, Watershed Districts, MNDNR	$20,000/year	All
Management of existing public land and acquisition of strategic parcels	Ongoing	DNR/USFWS/TNC	LTT, conservation clubs, MNDNR, USFWS, TNC	Unknown	All

- **Objective B:** Recognize areas that are unique to the County such as native prairie sites in the glacial beach ridge areas, and wetland areas of the lake region. Utilize Minnesota County Biological Survey (MCBS) Areas of Biodiversity Significance, native plant communities, and key habitats as a resource to identifying appropriate sites.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Seek funding opportunities with existing or future land retirement or easement programs, with cooperating partners	Ongoing	SWCD	NRCS, MNDNR, USFWS, TNC	$20,000/year	All
Minimize land use impacts of potential land use changes by the installation of BMP's	Ongoing	SWCD	NRCS, Watershed Districts, MNDNR	$15,000/year	All
Work with state, federal, and non-profit agencies/organizations on acquisition of strategic parcels	Ongoing	SWCD	MNDNR, USFWS, NRCS, Nature Conservancy	Unknown	All

Objective C: Protect and identify areas of threatened or endangered species.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Promote education on the species that are threatened or endangered	Ongoing	SWCD	MNDNR, USFWS, County, TNC	$4,000/year	All
Minimize land use impacts of potential land use changes by the installation of BMP's	Ongoing	SWCD	MNDNR, USFWS, Lake Improvement Associations, County	$15,000/year	All

Objective D: Preserve high quality wetlands within Polk County for their best functional values.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Identify wetlands that are of high value for banking, easements , flood storage, and wildlife.	Ongoing	SWCD	MNDNR, USFWS, TNC	Unknown	All
Offer cost share and other incentives to landowners to participate in wetland restoration	Ongoing	SWCD	MNDNR, USFWS, BWSR, NRCS	Unknown	All
Assist with development of Ag Wetland Bank sites	Ongoing	SWCD	NRCS, BWSR	Unknown	All

Objective E: Preserve and enhance water quality by enforcing the Minnesota Buffer Law.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Assist landowners with establishment of buffers and/or alternative practices	Ongoing	SWCD	NRCS, FSA	Unknown	All
Enforce buffer law for areas that are non-compliant with the buffer law	Ongoing	County	SWCD, BWSR	Unknown	All

Terrestrial Invasive Species

Objective A: Control invasive species by prevention, reduction and elimination.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Map know sites and species occurrence	Ongoing	County	Polk Co. Cooperative Weed Management Group, MNDNR, SWCD	$15,000/year	All
Conduct public education on the invasive species by public meeting, mailings, news releases and newsletters	Ongoing	SWCD	Polk Co. Cooperative Weed Management Group, MNDNR	$1,000/year	All
Seek funding though cooperating partners and grants	Ongoing	SWCD	Polk Co. Cooperative Weed Management Group, MNDNR	$500/year	All

Objective B: Continue support of the Polk County Cooperative Weed Management Area

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Have a central clearinghouse to compile all data collected	Ongoing	County	Polk Co. Cooperative Weed Management Group, MNDNR, SWCD	$30,000/year	All
Continue to have meetings to keep the PCCWM group active	Ongoing	County	Polk Co. Cooperative Weed Management Group, MNDNR , SWCD	$600/year	All
Keep the public informed of the PCCWM group activities	Ongoing	County	Polk Co. Cooperative Weed Management Group, MNDNR, SWCD	$300/year	All

Aquatic Invasive Species

Objective A: Control aquatic invasive species by prevention, reduction and elimination by utilizing the AIS Taskforce.

Action	Schedule	Lead Agency	Partnerships	Budget	Watershed
Education and Public Awareness outreach on AIS threats	Ongoing	County, DNR	Polk Co. AIS Taskforce, MNDNR	$10,000/year	All
Explore cost and feasibility of purchasing decontamination units for Polk County	Ongoing	County	Polk Co. AIS Taskforce	$20,000/year	All
Identify and map aquatic invasive species within county and regional threats	Ongoing	County	Polk Co, AIS Taskforce	$5,000	All
Continue the AIS prevention plan for Polk County	Ongoing	County	Polk Co. AIS Taskforce	$5,000	All
Hire seasonal AIS technician to perform watercraft inspections and provide education	Ongoing	County	Polk Co. AIS Taskforce, Lake Improvement Districts	$30,000/year	All
Provide funding for local units of government or lake improvement districts to conduct special projects to limit or control the spread of AIS	Ongoing	County	Polk Co. AIS Taskforce, Lake Improvement Districts	$10,000/year	All

V. Ongoing Activities

Polk County Local Water Plan

Administration	**Ongoing**	**SWCD**	**County**	**$23,916/yr**	

Polk County Local Water Management Program - Monitoring

Activity/Initiative	Schedule	Lead Agency	Partner Agency	Budget	Watershed District
DNR Lake Levels	7 per year	East Polk SWCD	MNDNR	$2,000	All
DNR Observation Well Measurements	8 per year	East Polk SWCD	MN DNR	$160	RLWD

Stream Readings	7 per year	East Polk SWCD	MPCA, MNDNR, RLWD, Riverwatch (IWI)	$3,000	All
Rainfall Monitoring	8 per year	East Polk SWCD West Polk SWCD	MNDNR	$400	All
Nitrate Testing Clinic	Yearly	East Polk SWCD	MN Dept. of Ag, MN Ext.	$360	All
Polk County Local Water Management Program - Education					
Northwest Water Festival	2 events per year	East Polk SWCD West Polk SWCD	Area 1 SWCD's	$900	All
Area 1 Envirothon	2 events per year	East Polk SWCD West Polk SWCD	Area 1 SWCD's	$900	All
Polk County Fair Booth Participation	Yearly	East Polk SWCD West Polk SWCD	Watershed Districts, County, MNDNR, USFWS, River Watch (IWI)	$400	All
Tree Newsletter	Yearly	East Polk SWCD West Polk SWCD	None	$1,200	All
UMC Class Presentations	2 per year	East Polk SWCD West Polk SWCD	Not Applicable	$800	Not Applicable
River Watch Presentations	2 per year 3 per year	East Polk SWCD West Polk SWCD	Not Applicable	$1,000	All
Newsletters (Lake Leader, Landowner, Polk County Feedlot Newsletter)	2 per year (both)	East Polk SWCD West Polk SWCD	None	$4,000	All
Rydell 7th Grade Youth Tour	Yearly	East Polk SWCD	None	$300	Not Applicable
Arbor Day Presentations	Yearly	West Polk SWCD	Not Applicable	$500	Not Applicable
Cooperative Weed Management Education	Yearly	East Polk SWCD	Township Boards, County Weed Inspector	$6,000	All

Polk County Feedlot Program

Activity/Initiative	Schedule	Lead Agency	Partner Agency	Budget	Watershed District
Administration	Ongoing	SWCD	MPCA, County	$7,500	All
Feedlot Inspection	Ongoing	East Polk SWCD West Polk SWCD	MPCA	$2,500	All
Feedlot Permitting	Ongoing	East Polk SWCD West Polk SWCD	MPCA, Polk County Environmental Services	$250	All
Feedlot Registration	Ongoing	East Polk SWCD West Polk SWCD	MPCA, Polk County Environmental Services	$1,000	All
Feedlot Staff Training	Ongoing	East Polk SWCD West Polk SWCD	MPCA, Polk County Environmental Services	$2,000	All
Feedlot Owner Assistance	Ongoing	East Polk SWCD West Polk SWCD	MPCA, Polk County Environmental Services	$5,000	All
Feedlot Administration	Ongoing	East Polk SWCD West Polk SWCD	MPCA, Polk County Environmental Services	$2,000	All
Wetland Conservation Act Program					
Activity/Initiative	**Schedule**	**Lead Agency**	**Partner Agency**	**Budget**	**Watershed District**
WCA Program Administration	Ongoing	SWCD	BWSR	$43,282/year	All
District Tree Program					
Activity/Initiative	**Schedule**	**Lead Agency**	**Partner Agency**	**Budget**	**Watershed District**
Hand Plant Tree Sales	Ongoing	East Polk SWCD West Polk SWCD	NRCS, Landowners	$22,500/year	All
District Tree Planting Services	Yearly (Spring)	East Polk SWCD West Polk SWCD	NRCS	$5,000/year	All
District Tree Maintenance Services	Ongoing	West Polk SWCD	NRCS	$1,000/year	All
Shoreland Ordinance					
Activity/Initiative	**Schedule**	**Lead Agency**	**Partner Agency**	**Budget**	**Watershed District**

DNR Shoreland Management	Ongoing	County Environmental Services	SWCD, MNDNR	$6,798	All

SSTS

Activity/Initiative	Schedule	Lead Agency	Partner Agency	Budget	Watershed District
SSTS Sewage Treatment Ordinance	Ongoing	County Environmental Services	MPCA, SWCD, BWSR	$9,931	All
Low-Income SSTS Fixup Program	Ongoing	County Environmental Services	MPCA, BWSR	$20,945	All

Appendix A

Common Abbreviations

ACOE – Army Corps of Engineers

AIS – Aquatic Invasive Species

BMP – Best Management Practice

BWSR – Board of Soil and Water Resources

CLWP – Comprehensive Local Water Plan

CRP – Conservation Reserve Program

DNR – Department of Natural Resources

FDR – Flood Damage Reduction

IWI – International Waters Institute

LGU – Local Government Unit

MDA – Minnesota Department of Agriculture

MPCA – Minnesota Pollution Control Agency

NRGG – Natural Resources Block Grant

NRCS – Natural Resources Conservation Service

RIM – Reinvest in Minnesota

RLWD – Red Lake Watershed District

SHRWD – Sand Hill River Watershed District

SWCD – Soil and Water Conservation District

TMDL – Total Maximum Daily Load

TSS – Total Suspended Solids

WCA – Wetland Conservation Act

WRP – Wetland Reserve Program

WD – Watershed District

WRAC – Water Resources Advisory Committee
1W1P – One Watershed, One Plan
WRAPs – Watershed Restoration and Protection Strategies

Appendix B

POLK COUNTY LOCAL WATER MANAGEMENT PLAN UPDATE

PRIORITY CONCERNS SCOPING DOCUMENT

April 14, 2011

For Review

Introduction

Polk County is located in northwest Minnesota. According to the U.S. Census Bureau, the county has a total area of 1,998 square miles of which 1,970 square miles is land and 27 square miles is water. According to the April 1, 2010 census, the population was 31,600. Projected population change as reported by the Minnesota Demographic Center, (June, 2007) show the population increases slightly (32,610) by the year 2015. The County seat is located in Crookston and the largest community is East Grand Forks. There are 58 townships and 15 cities within the county.

Polk County includes three general physiographic areas; glacial moraine, glacial lake-washed till plain, and glacial-lake plain. The glacial moraine is an area of hills and depressions that has local relief up to 150 feet and is present in the eastern part of Polk County. The glacial lake-washed till plain is flat to a very gently rolling area that has local relief up to 15 feet and is located mid-county. The western part of the glacial lake-washed plain is traversed by north-south and northeast-southwest trending long, narrow beach ridges, some are as much as 20 feet high. Approximately the western third of Polk County is glacial-lake plain. This area is extremely flat, sloping only a few feet per mile. (U.S. Geological Survey, Water-Resources Investigation Report 95-4201, 1996).

Polk County lies within the Red River of the North Basin Watershed. Due to the unique lake/river basin soils left by Glacial Lake Agassiz, the primary land use of Polk County is agriculturally based, approximately 78%. The 2007 Census of Agriculture County Data from the USDA National Agriculture Statistic Service shows the number of farms in Polk County is 1,609 with the average farm size at 684 acres. The total cropland acres are 976,367 and with 10,439 acres of irrigated land. Land use practices in the beach ridge areas have previously been gravel mining and agriculture. These areas are now trending toward the restoration of pre-settlement conditions.

Four major watersheds are predominant within the jurisdictional boundaries of Polk County. They include the Grand Marais Creek, Red Lake River, Sand Hill River, and the Clearwater River Watersheds. Three other major watersheds have small acreage within the County. They are the Wild Rice, Snake, and Marsh Watersheds.

Under legislative mandate, revisions to County Water Plans must be written within a watershed context. The purpose of this requirement is to ensure that counties look beyond the jurisdictional boundaries when making assessments and goals for water quality issues. By doing this, the county will be able to identify trends, problems, and opportunities that are specific to a watershed rather than assuming the problem or issue is confined to political boundaries.

MAJOR WATERSHEDS IN POLK COUNTY

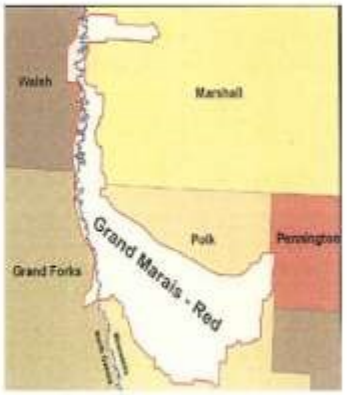
Red Lake Watershed

The Red Lake Watershed is 909,024 acres in size with the predominate land uses/land covers being row crops (61%), wetlands (17%), forest (10%), grass/pasture/hay (6%), and residential/commercial development (5%). Agricultural land use in the basin accounts for approximately 67 percent of the overall watershed.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water

quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loading to surface water (USDA Natural Resources Conservation Services *Rapid Watershed Assessment, Red Lake*, on-line).

Grand Marais Watershed



The Grand Marais Watershed is 298,264 acres in size with the predominate land uses/land covers being row crops (90.6%), residential/commercial development (5.1%), open water (1.8%), wetlands (1.6%), and forest (0.8%). Land use within the watershed is largely agricultural, accounting for nearly 92% of the overall watershed acres.

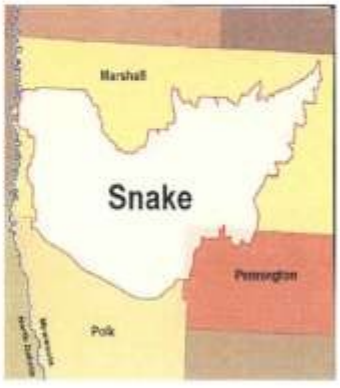
The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters (USDA Natural Resources Conservation Services *Rapid Watershed Assessment, Grand Marias*, on-line).

Sandhill-Wilson Watershed

The Sandhill-Wilson Watershed is 708,469 acres in size with the predominate land uses/land covers being row crops (81.5%), residential/commercial development (6.9%), wetlands (4.0%), grass/pasture/hay (3.1%), and forest (3.0%). Land use within the watershed is largely agricultural, accounting for nearly 85% of the overall watershed acres.

The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters (USDA Natural Resources Conservation Services *Rapid Watershed Assessment, Sandhill-Wilson*, on-line).

Snake Watershed



The Snake Watershed is 624,422 acres in size with the predominate land uses/land covers being row crops (81%), wetlands (6%), forest (5%), residential/commercial development (5%), and grass/pasture/hay (3%). Agricultural land use in the basin accounts for approximately 84% of the overall watershed acres

The main resource concerns in the watershed are wind erosion, surface water quality, nutrient, wetland, and pasture management, water quantity management and wildlife habitat. Many of the resource concerns relate to flooding and increasing sediment and pollutant loadings to surface waters(USDA Natural Resources Conservation Services *Rapid Watershed Assessment, Snake*, on-line).

Clearwater

The Clearwater Watershed is 886,632 acres in size with the predominate land uses/land covers being row crops (33%), forest (24%), grass/pasture/hay (21%), wetlands (14%), and residential/commercial development (4%). Agricultural land use in the basin accounts for approximately 54% of the overall watershed acres.

The main resources concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction, and wildlife habitat. Many of the resources concerns relate directly to flooding and increased sediment and pollutant loading to surface waters (USDA Natural Resources Conservation Services *Rapid Watershed Assessment, Red Lake*, on-line).

Polk County Local Water Management Plan's Update Process

The Polk County Water Plan focuses on water and related land resource issues. The county has gathered and studied available information relating to the physical environment, including, but not limited to, the surface and ground water resources, and their related land use.

Concerns were analyzed within the context of the watershed units and ground water systems where appropriate. The plan applies to the entire area within the county.

The plan is also based on key economic and environmental principles, and is consistent with other plans that exist for Polk County, including Watershed Districts, Soil and Water Conservation Districts, Environmental Service agencies, Red River Valley Basin organizations, and appropriate state and federal agencies.

The Polk County Water Plan is coordinated and administered by the East Polk Soil and Water Conservation District and the West Polk Soil and Water Conservation District. Other *Natural Resources Block Grant* Programs that Polk County participates in are; **Minnesota Wetland Conservation Act (WCA)** administered by the East and West Polk Soil and Water Conservation Districts, **Minnesota Pollution Control Agency's Feedlot Program** administered by the East and West Polk Soil and Water Conservation Districts, **Minnesota Department of Natural Resources Shoreland Program** administered by Polk County Planning and Zoning, **Minnesota Pollution Control Agency's Subsurface Sewage Treatment System (SSTS) Program** administered by Polk County Planning and Zoning.

The Polk County Water Plan (previously known as the Polk County Comprehensive Local Water Plan) was first developed and approved by the Minnesota Board of Water and Soil Resources in 1990. It was developed as a five year plan and was updated in 1997 (the 1990-1995 Plan was granted a two year extension). The 1997-2002 Plan was granted a two year extension. The 2005 to 2009 plan was also granted a two year extension which expires December 31, 2011.

The 2012 Polk County Water Plan will apply for a period of ten years from the date of State approval.

List of Priority Concerns – Polk County Local Water Management Plan Update

Through the Advisory Work Group process with excellent representation and input by the Work Group, as well as a comprehensive call for input to the Polk County Local Water Management update process, it was determined that the three Priority Concerns identified in the expiring plan were still relevant with the addition of a fourth Priority Concern. The three previous Priority Concerns (PC 1, 2, and 3) will be updated as needed to reflect current data and information with appropriate action items.

Priority Concern 1: Surface Water Quality

The Polk County Local Water Management Plan will focus on protection and enhancement of surface water quality. Specific areas of focus will be:

- Lakes region in the eastern part of the county, with specific focus on the human impacts
  - Increases in development around smaller, non-recreational lakes and larger wetland complexes should be assessed to determine if adverse impacts have affected the water quality of the these smaller bodies of water
  - For nearly all of the lakes in this ecoregion, phosphorus is the limiting factor. Major management efforts related to water quality are directed at limiting the amount of phosphorus loading into the lakes
  - Sediment loading has also become a major concern to the water quality of the lakes. Proper land use management and implementation of *Best Management Practices* needs to be analyzed and addressed
- Source water supplies in the western part of the county
  - The City of East Grand Forks (and to some extent the City of Grand Forks) receives its public water supply from the Red Lake River
  - The Red Lake River is impaired for turbidity and management efforts should focus on sediment loading into the Red Lake River and its tributaries

Polk County will be an active participant of the *Total Maximum Daily Load (TMDL)* process as they are initiated in the associated watersheds.

Priority Concern 2: Water Quantity

The Polk County Local Water Management Plan will focus on the *quantity* of water passing through the County and its associated watersheds by inventorying, assessing and evaluating the drainage infrastructure.

Due to the fluvial geomorphic characteristics of the Red River of the North Basin, Polk County is subject to frequent flooding. Some factors such as topography and increased precipitation are unmanageable, but other factors such as floodplain encroachment, channelization of waterways, land use practices and ineffective private drainage into public systems, are factors that can be assessed for *Best Management Practices*.

Water quantity, whether in excess or lack of, has an impact on the natural resources and economy of Polk County and its associated watersheds.

Priority Concern 3: Management, Enhancement and Preservation of Natural Resources within the Glacial Lake Agassiz Beach Ridge area

The Polk County Local Water Management Plan will focus on *Best Management Practices*, enhancement activities and preservation of the unique geographical features and the wide diversity of flora and fauna found in these areas.

The Glacial Lake Agassiz Beach Ridge area in Polk County contains some of the largest tracts of native prairie in the state. These prairies are typically of high quality and including good examples of dry mesic and wet prairies.

With the unique natural resource benefits found in the Glacial Lake Agassiz Beach and the native prairie and pre-settlement restoration that has occurred through the Nature Conservancy's Glacial Ridge Project, there is an economic benefit to Polk County and its citizens.

Priority Concern 4: Exotic and Invasive Species Management

The Polk County Local Water Management Plan will identify any new or yet to date undiscovered exotic and invasive plant and aquatic species for prevention and management practices

- Currently one lake in eastern Polk County has been identified to have an infestation of Eurasian Water Milfoil
- Spotted knapweed, Leafy spurge and Wild parsnip are examples of some of the noxious weeds that have readily established themselves in Polk County

Identification, education and management are beneficial tools that would be used to control and in some cases, hopefully, eradicate this resource management problem.

Priority Concerns Identification

Public and Internal Forums

- September 29, 2010 – Initial Polk County Water Plan Work Group meeting
    - Agenda:
        - Introduction of what the County Water Plan is
        - Role of the Polk County Water Plan Work Group
        - Review of the previous Polk County Water Plan
        - Development Process for the Polk County Water Plan update
        - Timeline of process
    - Work Group Members
        - County Commissioners; Craig Buness and Warren Affeldt
        - East Polk SWCD Staff – Gary Lee
        - East Polk SWCD Supervisor – Larry Vettleson
        - West Polk SWCD Staff – Paige Guetter
        - West Polk SWCD Supervisor – Russ Severson
        - Union Lake Sarah Lake Association - Brian Paradis
        - MN Dept. of Natural Resources – Terry Wolfe (Wildlife) and Garry Bennett (Hydrology)

- US Fish and Wildlife Service – Ryan Frohling
- The Nature Conservancy, Glacial Ridge Project – Keith Mykleseth
- Polk County Planning and Zoning – Josh Johnston
- MN Board of Water and Soil Resources – Brian Dwight
- MN Pollution Control Agency – Jim Courneya
- Sand Hill River Watershed District – Dan Wilkins
- Red Lake Watershed District – Corey Hanson
- Middle-Snake-Tamarac Watershed District – Nick Drees
- MN Dept. of Agriculture – Rob Sip
- MN Dept of Health – Bemidji District Office
- Natural Resources Conservation Service – Randy Huelskamp
- City of East Grand Forks – Dan Boyce
- City of Crookston – Pat Kelly
- City of Fosston – Charles Lucken

- September 30, 2010 – *Priority Concerns Input Document* sent to Work Group members for input, due date October 31, 2010
- October 8, 2010 – Request for *Plans and Official Controls* and *Priority Concerns Input Document* sent to required Local Governmental Units and State Agencies, due date December 1, 2010
- January 5, 2011 – Polk County Water Plan work Group meeting to:
  - Review and discuss submitted *Priority Concerns Input Documents and Plans*
  - Prioritize Priority Concerns
  - Identify Priority Concerns for the Polk County Local Water Management Plan
- February 2, 2011 – Notice of Public Input meetings sent for publication in the:
  - East Grand Forks Exponent, East Grand Forks, MN
  - Crookston Times, Crookston, MN
  - The Thirteen Towns, Fosston, MN
- Public Informational and Input meetings held on:
  - February 10, 2011, 11:00 a.m. at the East Polk SWCD office
    - 1 person in attendance, no input comments
  - February 16, 2011, 8:00 a.m. at the West Polk SWCD office
    - no one in attendance, no comments received

Issues Identified by Stakeholders

Bulleted items are comments and inputs received by the referenced agency/representative.

Priority Concern 1

Polk County will focus on surface water *quality*; specifically as it pertains to the human-impacts on the lakes region in the eastern portion of the County and as it pertains to the surface water resource as a source water supply in the western portion of the County

- Participation, outreach and implementation in the TMDL process (RLWD, MPCA, Marshall Co., City of Crookston, City of East Grand Forks, BWSR)
- Surface water data base (RLWD)
- Stormwater attributing to water quality (MPCA)

- Feedlot compliance (MPCA)
- Sealing of unused wells (MDH, City of East Grand Forks)
- Development along shorelines of MN Protected Waters Wetlands (BWSR)
- Lake shed assessments on major three lakes in Polk County (BWSR)
- Installation of AgBMPs and runoff reductions practices based on conservation farm planning (BWSR)
- Promote and install when possible conservation drainage practices during new construction, maintenance and repairs of private and public drainage systems (BWSR, MPCA, Townships)

Priority Concern 2

Polk County will focus on the *quantity* of water passing through Polk County by inventorying, assessing and evaluating the drainage infrastructure of the County.

- Water Quantity as it relates to flooding (RLWD, City of Climax, City of Nielsville)
- Drainage issues (Townships, Municipalities)
- Stormwater runoff (MPCA,)
- Sealing of unused wells (MDH, City of East Grand Forks)
- Overland flooding (Townships)
- Drainage record modernization (BWSR)
- Water management authorities promote and install conservation drainage practices when maintaining and/or improving drainage systems (BWSR, MPCA)

Priority Concern 3

Polk County is concerned with the preservation and enhancement of Polk County's natural resources within the Glacial Lake Agassiz Beach Ridge area because of the unique geographical features, wide diversity of natural resources and the citizens that benefit from them.

Priority Concern 4

Exotic and invasive species management (Lake Assoc.)

- Carp
- Milfoil
- Zebra mussels
- Education, promotion and regulation/enforcement

Others

- Ground water quality (City of Crookston, MDH)
- Ground Water data base (City of East Grand Forks)
- Small municipalities and waste water
- Agricultural Heritage – discussion of this incorporated into the Executive Summary of the Plan

Priority Concerns Selection

The Polk County Water Plan addresses in Priority Concern 1 goals and objectives that promote and educate the citizens of Polk County about the BMP's and the wise use of our natural resources as it pertains to water quality.

Also addressed in Priority Concern 2 goals are three objectives:

- Ensure that county, township, watershed, and private ditch systems adequately address the drainage needed to support agricultural activities without negatively impacting water quality and other natural resources, as well as economic impacts to the infrastructure of Polk County
- Determine if ditch systems are of adequate size
- Determine whether there is proper maintenance

Priority Concerns Not Addressed by the Plan

One input received and discussed at the second Polk County Water Plan Work Force meeting was an expressed concern about maintaining the County's strong agricultural heritage and culture.

This was not chosen as a Priority Concern, but the Work Force and Plan Developers felt it was important and will be incorporated as a Needs Statement in the Final Polk County Local Water Management Plan, 2012 – 2022.