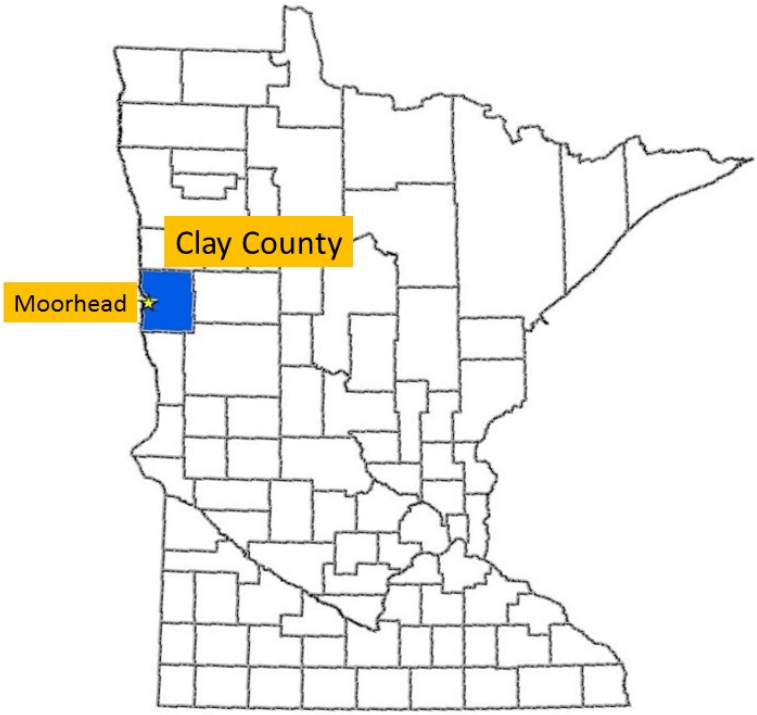
LOCAL WATER MANAGEMENT PLAN
2017-2026



Prepared by the Clay Soil & Water Conservation District
And the Local Water Management Plan Advisory Committee

This Plan was approved by
the Board of Water and Soil Resources April 26, 2017,
and locally adopted by the Clay County Board May 9, 2017

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LIST OF FREQUENTLY USED ACRONYMS

ASG	Agricultural Service Groups
BMPs	Best Management Practices
BRRWD	Buffalo-Red River Watershed District
BWSR	Board of Water and Soil Resources
CCRP	Continuous Conservation Reserve Program (USDA)
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program (USDA)
CSP	Conservation Stewardship Program
DNR	Department of Natural Resources
DU	Ducks Unlimited
DWM	Drainage Water Management
DWSMA	Drinking Water Supply Management Area
EQIP	Environmental Quality Incentive Program (USDA)
EH	Environmental Health (Clay County)
Ext	Extension (U of M – Clay County)
FEMA	Federal Emergency Management Agency
FME	Farm Management Educators
LiDAR	Light Detection and Ranging
LWMP	Local Water Management Plan
MAWQCP	MN Agricultural Water Quality Certification Program
MDA	MN Department of Agriculture
MDH	MN Department of Health
MIS	Management Information Systems
MPCA	MN Pollution Control Agency
MPS	Moorhead Public Service
NRCS	Natural Resources Conservation Service
PF	Pheasants Forever
PTMApp	Prioritize Target Measure Application
P&Z	Planning and Zoning (Clay County)
RAL	Regional Assessment Locations
RIM/WRP	Reinvest In Minnesota/Wetland Reserve Program
RW	River Watch
SPI	Stream Power Index
SRF	State Revolving Fund
SSTS	Subsurface Sewage Treatment System
SWCD	Soil and Water Conservation District
SDWA	Safe Drinking Water Act
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TWP	Township
USFWS	US Fish and Wildlife Service
WCA	Wetland Conservation Act
WMA	Wildlife Management Area (state owned)
WPA	Waterfowl Production Area (federally owned)
WRAPS	Watershed Restoration and Protection Strategy
WRWD	Wild Rice Watershed District
WD	Watershed Districts (collectively)

CLAY COUNTY LOCAL WATER MANAGEMENT PLAN ADVISORY COMMITTEE

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APPENDICES

A – LIST OF FIGURES

B – PRIORITY CONCERNS SCOPING DOCUMENT

EXECUTIVE SUMMARY

Population and Population Trends: Clay County is located in west central Minnesota along the western boundary separated from North Dakota by the Red River of the North. Moorhead, the county seat, is centrally located along the western boundary of the county. Clay County is bordered by Wilkin County to the south, Otter Tail County to the southeast, Becker County to the east and Norman County to the north.

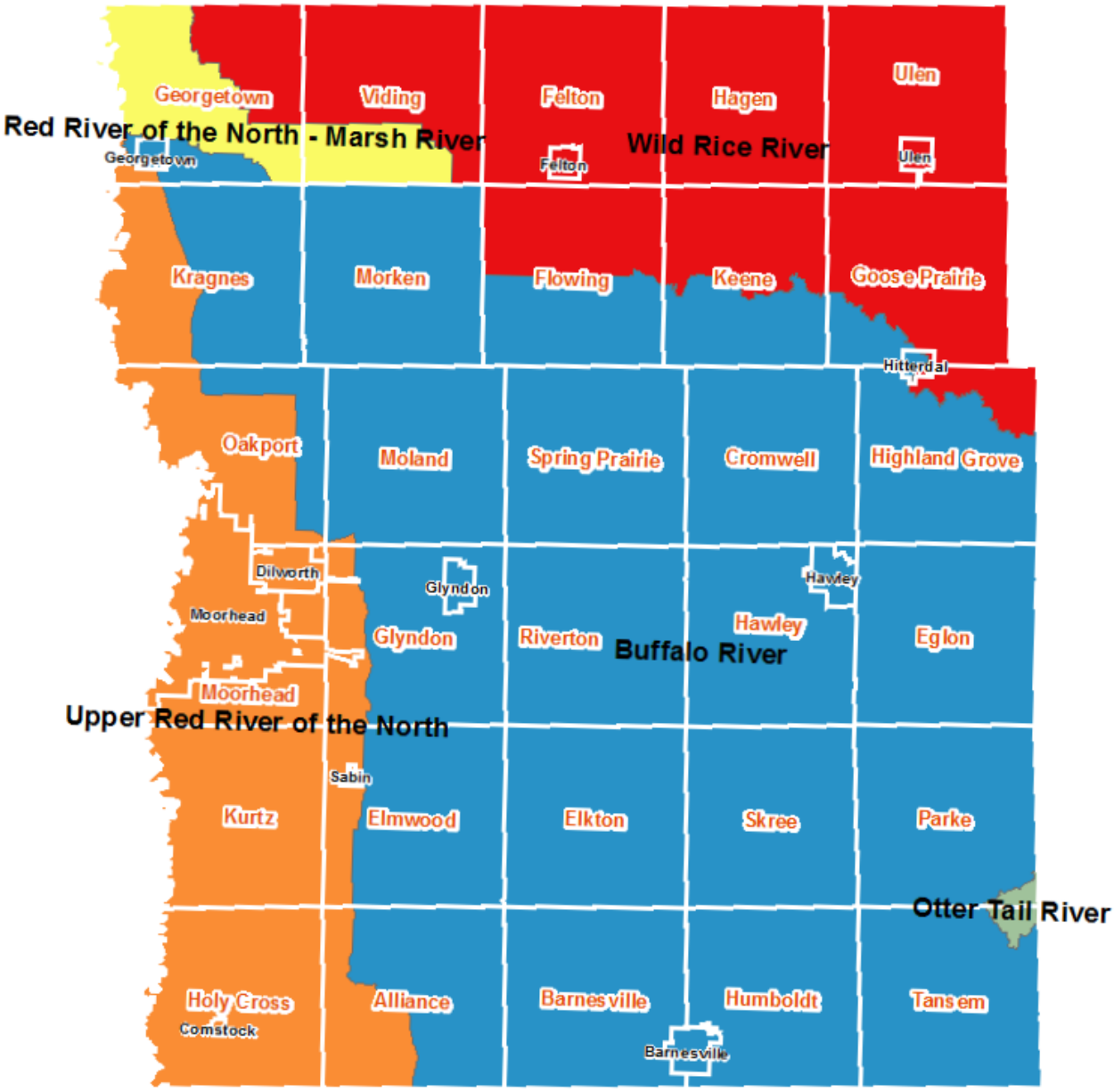
According to the 2010 census, the population of Clay County was 58,999. The Minnesota State Demographics Center estimated the population to be 62,181 in 2015. Moorhead comprises 65% of the County's total population. The cities of Dilworth, Barnesville, Hawley and Glyndon comprise another 17% of the County's total population with the remaining residing outside these incorporated areas. The Minnesota State Demographic Center projects the population will increase by 11% by 2045.

Dominant Land Use and Trends: Clay County encompasses 1,054 square miles or 675,026 acres. It is divided nearly in half north to south with the western half comprised of the very fertile Red River of the North Basin of Northwestern Minnesota. The eastern half of the county is dominated by beach ridge deposits associated with Glacial Lake Agassiz. Cultivated land constitutes the largest portion of Clay County at 76.8%. The remaining 23.2% of the land use is comprised of urban development/open space (6.6%), grassland, hayland, or pasture (6.4%), bog, marsh, fen (wetland) (5.2%), forested land (3.0%), water (1.8%), barren land (0.1%) and brushland (<0.1%).

Land Use Category	Percent of Total
Cultivated Land	76.8%
Grassland, hayland, or pasture (combined)	6.4%
Forested land	3.0%
Urban development/open space	6.6%
Bog, marsh, fen (wetland)	5.2%
Water	1.8%
Barren Land	0.1%
Brushland	<0.1%

Source: 2011 National Land Cover Dataset

Despite the limited amount of surface water resources, surface water drainage dictates land use, and management of water resources on a watershed scale is paramount. Two primary watersheds, the Buffalo River watershed and the Wild Rice River watershed divide Clay County. Three smaller, secondary watersheds, the Red River (headwaters) watershed, the Otter Tail River watershed, and the Marsh River watershed, drain smaller portions of the county to the west, east and north respectively. In terms of water management, those areas in Minnesota that drain directly to the Red River are included under the Buffalo River Watershed. The Wild Rice River Watershed, and the Marsh River are included under the Wild Rice River.



The Buffalo-Red River Watershed District (BRRWD) encompasses a land area of 1,785 square miles. Approximately 75 percent of the geographic area of Clay County is in the BRRWD, which translates to 44 percent of the watershed area. The Buffalo River originates in Becker County, but transects Clay County where it enters the Red River of the North northwest of Georgetown. The main tributaries to the main branch of the Buffalo River include Hay Creek (originating in Becker County) and the South Branch of the Buffalo River. Again, several drainage ditches also contribute to this branch of the Buffalo River. Major tributaries of the South Branch of the Buffalo River include Hay Creek, Stony Creek, Spring Creek, Whisky Creek, and several drainage ditches. Wolverton Creek/ Comstock Coulee, although a direct tributary of the Red River of the North, is also included in this watershed. The Wild Rice Watershed District (WRWD)

encompasses a land area of 2,080 square miles. Approximately 25 percent of the geographic area of Clay County is in the WRWD, which translates to 12 percent of the watershed area. The South Branch of the Wild Rice River runs across the northeast corner of Clay County from east to west with its headwaters located in Becker County and its terminus in Norman County. Other surface waters in Clay County include Stiner Creek, Felton Ditch, Dalen Coulee and several drainage ditches that are tributaries of the Wild Rice River, or the Red River of the North.

Although the land use figures vary somewhat from year to year, the dominant land uses do not. The struggle between urbanization or increased growth and the traditional agricultural character of the County is clear and present. The challenge for Clay County is to find balance between the preservation of the agricultural heritage, protection of the remaining natural resources and the desire for economic and community growth. To achieve such goals will require the careful, comprehensive consideration of the County's natural resources.

Administration of the Clay County Local Water Management Plan

The administration of the Clay County Local Water Management Plan has been the responsibility of the Clay Soil and Water Conservation District (Clay SWCD) since 1998 (from 1990 to 1998 with the County Planning and Zoning Department). The first generation "Water Plan" was adopted June 12, 1990, and, in 1997, was revised and adopted locally on December 17, 1997. This second generation plan, after a requested two-year extension, expired on December 31, 2005. The third generation of the plan covered a ten year period from 2006 to 2015, with a plan amendment in 2010. The plan, after a one-year extension expired on December 31, 2016. The fourth generation of the plan will go from January 1, 2017 through December 31, 2026.

The Purpose of Local Water Management

The purpose of this Local Water Management Plan for Clay County is:

1. *To identify existing or potential problems and opportunities for protection, management, or development of water resources and related land resources in the county.*
2. *To develop and implement a plan of action to promote sound hydrologic management of water and related land resources in the county, and*
3. *To work toward effective environmental protection and management in the county.*

Pursuant to Minnesota Statute 103B.311, subd. 4, the local water management plan must;

1. address water management issues over the entire county
2. address problems in the context of watershed units and groundwater systems
3. be based upon principles of sound hydrologic management of water, effective environmental protection, and efficient management
4. be consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or groundwater systems
5. address water management issues over a ten year period with five year implementation plans

The Water Management Plan revision process requires that the county base future management considerations on public input derived from private citizens and public agencies. Public input was gathered through public meetings, township officer surveys and agency comments (see the *Clay County Priority Concerns Scoping Document* in the Appendix for more information). Through the Water Management Plan revision process, four *PRIORITY CONCERNS* were identified to address in the coming decade; water quality, natural resources enhancement and protection, flood damage reduction and erosion. The process through which these concerns were identified is detailed in the *Clay County Priority Concerns Scoping Document* located in the Appendix.

The total projected cost to implement the goals and actions of this plan is $10,180,500. Please see the Implementation Schedule starting on page 33 for a detail breakdown of the estimated cost.

Summary of Priority Concerns and Objectives

Priority Concern: Water Quality (surface and groundwater)
Clay County is bordered on its west by the Red River of the North and is dissected by the Buffalo River (South Branch and Main Branch), South Branch of the Wild Rice River, and their respective tributaries. Additional surface waters include several small, shallow lakes and numerous scattered wetlands. Four of these lakes, Lake 15, Turtle Lake, Silver Lake and Lee Lake, are moderately to extensively developed, and many more are experiencing development. Most surface waters in Clay County are degraded, and several are listed as impaired waters (Figure 1-3). Current maps are available on the MPCA website (www.pca.state.mn.us) as defined by the Clean Water Act (CWA). As such, these waters do not meet water quality standards designed to protect human health and biological functions and, thus, must be cleaned up to meet their intended use via locally developed Total Maximum Daily Load (TMDL) Plans. Further, groundwater resources within the County are of utmost concern. Specifically, the Buffalo Aquifer, emergency water supply source for over 70 percent of the County's population, is vulnerable to contamination from surface water (the South Branch of the Buffalo River and gravel pits exposing the water table), land use activities, abandoned wells and leaking storage tanks. In addition, the geology of the middle portion of the county causes the underlying groundwater resources to be very highly susceptible to contamination (Figure 5-6). As such, it is critical that future land uses be carefully considered to further protect the county's groundwater resources. For more information on groundwater resources of Clay County, see the maps highlighting groundwater resources (including major aquifers and current, defined wellhead protection areas) and contamination potential in the Appendix.

This plan will address the following objectives related to this concern:

- Actively participate in the implementation of Total Maximum Daily Load (TMDL,) and Watershed Restoration and Protection Strategy (WRAPS) Report Plans for impaired waters within Clay County and address these impairments; particularly, sedimentation.
- Aggressively market conservation programs (such as CRP, RIM and CREP) when acres are available in areas lacking riparian buffers, and low interest loan programs (such as the State Revolving Fund [SRF]) for failing septic systems to further protect water quality.
- Protect and preserve critical groundwater sources (such as the Buffalo and Border Aquifer) through assisting in Wellhead Protection Plans, Source Water Assessment Plans, and prioritizing cost share funds for sealing abandoned wells within and out of delineated Drinking Water Supply Management Areas (DWSMA).

Estimated Potential Cost: $13,153,500

Priority Concern: Natural Resources Enhancement and Protection

Clay County is truly unique in that it is dominated by agricultural land use, yet retains some of the highest quality, biologically significant natural resources in Minnesota. According to the Minnesota County Biological Survey (MCBS), Clay County retains only 4 percent of its original native (presettlement) landscape – much of which is high quality, high biodiversity natural lands. As the Presettlement Vegetation map (Figure 7) denotes, much of the historic vegetation regime of Clay County prior to European settlement was comprised of Tallgrass prairie, wet prairie, riverine and pothole wetland complexes, and oak savannah. Much of this original landscape has been altered in one way or another resulting in a patchwork of natural resource features. The Felton Prairie, Bluestem Prairie near Buffalo River State Park, and the Barnesville Wildlife Management Area denote three key large-block habitats linking the Glacial Lake Agassiz Beach Ridges landscape from north to south. Indeed, agency efforts at the federal, state and local level are all focused on connecting large blocks of native habitats, restoring riverine corridors, and buffering surface waters to reduce the effects of habitat fragmentation, providing connections (connectivity) between habitats for wildlife, and protecting the unique natural resources of Clay County and the greater Red River Basin Ecosystem. Although a watershed approach to these efforts is noteworthy, the preferred focus may be on the three "geomorphic regions" of the County as depicted in the Public Land map (Figure 8). This plan will address the following objectives related to this concern:

- Consolidate the natural resource management planning and implementation efforts of federal, state and local agencies using existing prioritization models to target program funds to areas where the greatest ecological benefit can be realized. Also, develop public outreach materials to educate the public of the value of natural resource areas.
- Develop and organize a series of workshops, or other outreach options in cooperation with the local Pheasants Forever Farm Bill Biologist, to educate landowners on the options available to them to protect natural resources and reduce the impacts of wildlife habitat fragmentation of existing woodland and wetland/grassland habitat on their land through conservation program agreements, tax exemption programs, or easements.
- Quantify the need for adequate buffers on stream/rivers county-wide and "natural environment lakes" and target areas with inadequate buffers for program marketing and implementation, and target minor watersheds with greater than 50 percent drained wetland acreage for wetland restoration and enhancement using available conservation programs and tax exemption programs.
- Complete a quality restoration of an abandoned gravel pit complete with grading, shaping, seeding with native vegetation, and vegetative management. Use the proposed reclamation as a public outreach/education event.
- Quantify the need for grade stabilization on specific reaches of streams and rivers throughout the beach ridges to enhance fish habitat and reduce in-stream erosion.
- Publicize the vast "outdoor based" recreational opportunities in the county –

canoeing, kayaking, hunting, fishing, birding, hiking, etc. - as viable "ecotourism", revenue producing opportunities. This is evident by the designation of the Red River and Otter Tail Rivers as official Boating and Canoe Routes by the MN DNR.
- Educate the public on how conservation efforts can be supported through easy-to-do opportunities such as Backyard Conservation and Urban Conservation, and new marketing strategies for commodities – "earth friendly" cereals, bread, etc

Estimated Potential Cost: $50,500

Priority Concern: Flood Damage Reduction (FDR)

Flooding and flood related damages have, and will continue to plague the Red River Basin. In the past 111 years, the river has been higher than flood stage 50 times. In the past 21 years, the river has been higher than that 20 times. The topography of the county, an especially flat western half, lends itself to the potential for flooding. The Federal Emergency Management Agency (FEMA) Floodplain map (Figure 9) designates the current floodplain areas. The challenge is dealing with flooding and flood related damages in a collective manner. Improvements have been made by communities and resource agencies to deal with flood damage reduction, but there is room for improvement. Zoning regulations between communities seem to lack consistency in dealing with flood prone areas, and poor land use decisions continue to be made although progress has been made in recent years. Stormwater issues, runoff from developed and developing areas, in addition to urban drainage require more attention and coordination from local levels of government. As such, this plan will address the following objectives related to this topic:

- Commit to a decade of county involvement in the FDR process by Local Water Management focus on FDR strategies including, but not limited to, flood storage wetlands and impoundments, wetland restorations, river corridor restorations, riparian buffer strips, retirement of land, land use and best management practices.
- Investigate issues of conflict/concern with FDR efforts including; 1) the conflict in culvert sizing between fish passage and flow velocity, 2) the effects of pattern tiling on water quality and water quantity and encourage the use of Drainage Water Management (DWM) BMPs..
- Involve townships in the FDR process by interviewing township officers to determine where flooding consistently occurs in their township and correlate with soils data, past floodplain data, and new floodplain data to create maps of "flood prone areas" in the county and provide these maps to the Clay County Planning Commission and County Board.
- Involve communities in the FDR process through enhanced education and outreach, and challenging communities to develop plans to address drainage and stormwater challenges caused by future land use changes.

Estimated Potential Cost: Attempts will be made to cover Objectives with existing staff and funds.

Priority Concern: Erosion

There are many general land use practices in Clay County that have the potential to impact both surface water quality, but soil erosion from the landscape is the leading cause of sedimentation of Clay County's surface waters. The geology and topography of the landscape, in addition to the predominance of open cultivated land, creates a challenge for agricultural producers and resource managers alike to prevent soil erosion. As the economics of farming goes, so goes the landscape. Commodity prices, cost of fuel and the introduction of genetically modified crops all play a role in *how* cropland is farmed and *how much* is farmed. Nearly all of the soils in Clay County are potentially subject to erosion rates beyond sustainability if adequate groundcover is lacking according to the calculations used by the Natural Resources Conservation Service (NRCS). All soil has the potential to erode, but there are soils that are much more prone to erosion than others (Figure 10). Wind and water erosion delivers sediment to water bodies, as well as chemical residue and nutrients such as phosphorus and nitrogen. In addition to degrading the quality of the water, storage capacity and the conveyance of a water body can be altered, increasing the severity of in-stream erosion and flooding. The resulting increase in turbidity causes exceedances in turbidity water quality parameters thereby leading to "impairment". In the case of the Red River of the North, municipal water treatment facilities in Moorhead, MN and Fargo, ND incur increased costs to treat turbid water for human consumption. This plan will address the following objectives related to this concern:

- Coordinate with Clay County Farm Management Educators to improve dialogue and discuss topics such as; the economics of tillage to illustrate the potential savings of reduced tillage for a "typical farm" (reduced recreational tillage, conversion to no-till or mulch-till, cover crops, soil health, etc.), and the obstacles to tillage practices including the relationship between residue management and incidence of crop disease.
- Continue to market (with emphasis on the eastern half of the county) no-till, mulch-till, soil health and cover crops via the SWCD No-till Drill Program and the Environmental Qualities Incentive Program (EQIP). Also, research the Clay SWCD records to determine the percentage of producers who rented the no-till drill, then bought their own through the SWCD administered low interest loan program.
- Address the problem of erosion county-wide by; 1) Marketing "alternatives" to field windbreaks in the form of replacing trees with shrubs (and thereby more windbreaks to adequately cover the entire field), and implementing herbaceous wind barriers and field borders, 2) Assist landowners in establishing buffers or alternative practices in accordance with the 2015 Buffer and Soil Loss Law (Minn Stat. 103F.48). In addition, investigate excessive soil loss complaints and follow up with landowners violating the Soil Loss portion of the law. 3) Utilize GIS to select soils with C slopes or greater ($C \geq$ 6-12 percent) to determine the extent of gully erosion and target establishment of practices such as grassed waterways, water and sediment control basins, grade stabilization structures and subsequent enrollment into associated conservation programs, 4) Investigate and document the extent of

farming of road ditches in the county.

- Reduce the incidence of in-stream erosion and streambank erosion by; 1) Utilizing existing stream survey information to target practices and special projects, and 2) Cooperate with townships and agencies to inventory streams and rivers for grade stabilization needs.

Estimated Potential Cost: $12,000

Consistency with Other Local, State and Regional Plans

Preparation of the Clay County Local Water Management Plan (LWMP) required the review of several existing planning documents from governmental and nongovernmental organizations. Due to the nature of county based water management, the plans were examined for consistency from the "local level up" approach.

City Plans Some plans at the city level were analyzed for consistency including the Moorhead Public Service Wellhead Protection Plan, and Source Water Assessment Plan. The Buffalo Aquifer Management plan is expect to be approved in the next month or so, and will be assessed once it is complete. These plans address many of the same issues raised in the LWMP, but address certain issues in more detail. The intent of the LWMP is to assist in these efforts and not duplicate efforts unnecessarily.

County Plan The Clay County Comprehensive Plan completed and adopted in 2001 addresses many of the concerns raised in this LWMP revision. There exists consistency with issues such as development, agricultural preservation and natural resources protection. (http://claycountymn.gov/329/Comprehensive-Plan)

Watershed District Plans The BRRWD Watershed Management Plan has been revised as of 2010, whereas the WRWD Management Plan was revised in 2002 and a new revision is anticipated. Clay County will work with the Watershed District to incorporate the LWMP into the new 1 Watershed, 1 Plan (1W1P) program currently being implemented by the Board of Water and Soil Resources. Watershed Districts inherently deal with many of the same issues as LWM, thus it is assumed that the concerns to be addressed by the LWMP are consistent with those of the Watershed Districts. Clay County, through LWMP will continue to work closely with both Watershed Districts to promote the betterment of Clay County's water resources.

Red River Basin Plans Given the nature of Clay County and the water management concerns raised, the revised Clay County LWMP supports the goals and principles of the Red River Basin Flood Damage Reduction Work Group Agreement dated December 9, 1998. Also completed in 1999, the MN Pollution Control Agency (MPCA) spearheaded the completion of the Red River Basin Water Quality Plan which addresses issues related to water quality. Again, the Clay County LWMP supports the goals, priorities and strategies of this plan.

Regional Plans Given the acreage owned by The Nature Conservancy (TNC) in Clay County, the Minnesota Prairie Conservation Plan (www.nature.org/media/minnesota/mn-prairie-conservation-plan.pdf) was reviewed for commonalities. High priority issues that parallel those of the Clay County LWMP include grassland management, habitat fragmentation and conversion, hydrologic alterations to the landscape, wetland management and recreational use.

Other regional plans include the DNR's Prairie Conservation Plan and the Felton Prairie Stewardship Plan.

Neighboring County Plans Nearly all of the neighboring counties are updating their LWM Plans. Several recurring themes are anticipated with these new plans including concerns related to; erosion, water quality, and development pressure. Clay County does not anticipate any inconsistencies between county LWM Plans.

Pursuant to Minnesota Statute 103B.314, subd. 1 (5), the local water management plan must include a summary of recommended amendments to other plans and official controls. No amendments are recommended.

ASSESSMENT OF PRIORITY CONCERNS

ASSESSMENT OF WATER QUALITY

Surface Water The potential for contamination through human activity is high in Clay County. Given the fact that a majority of the land area is dedicated to farming, agricultural activities have the greatest potential to contribute pollutants to surface water resources. Major pollutants would likely include sediment, nutrients (phosphorous and nitrogen), and pesticides. Urban and food processing plants also have the potential to contaminate surface waters. Pollutants include treated effluent, coliform bacteria, organics, pesticides, and fertilizers. Additional sources of contamination include urban areas, transportation arteries and pipelines that transect the County and represent locations of possible toxic-waste spill sites and point discharges of contamination to water sources (Stoner et al. 1993).

Pesticides are also a potential concern for water quality. Although used extensively in the Red River Valley, only small amounts have been detected in streams. Moreover, they comprise only 2 percent of the total amount applied, and are usually at concentrations well below drinking water standards. Results indicate that the organic soils, flat land, pesticide degradation and pesticide management limit the amount of pesticide contamination that reach Red River Basin streams (Tornes and Brigham 1995).

Clay County's water resources are classified for a variety of uses including; habitat for fish and wildlife, drinking water supplies, sources of recreation, agriculture or industrial water, and navigation (MPCA, 1994). The MPCA sets specific water quality standards for these uses. If these standards are frequently exceeded, the water body is either fully supporting, partially supporting or not supporting for that use. Turbidity, primarily caused by excess sediment suspended in the water, is the most prevalent impairment. Sources of pollution include sediment, urban runoff, animal holding/management areas, and septic systems. Contamination of surface waters by these pollutants results in decreased dissolved oxygen, habitat and biodiversity, and increases in sedimentation, eutrophication and turbidity (based on the 2004 MN 303(d) report to the Congress of the U.S. MPCA, 2004). Sedimentation is the primary concern for Clay County's streams and rivers. Streams and rivers throughout the County may have been impacted and degraded by increased sedimentation over the past 100+ years due to land use changes and alterations to drainage patterns and timing. High levels of total suspended solids in the Red River have raised concern by the MPCA and the City of Moorhead as to continued use of Red River water for domestic consumption.

Individual on-site sewage treatment systems pose another potential source for surface water impacts. These systems are in use throughout the County and if not properly installed or maintained can have a direct impact on the quality of surface water and groundwater. Improperly installed and operated systems that discharge to the surface

are considered to be “imminent health threats” and need to be addressed through the County Sewage Treatment Ordinance. At present, Clay County’s response to noncompliance septic systems is reactionary on a complaint basis, sale/transfer of property, or application for building permits. The Comprehensive Sewer Ordinance follows Minnesota Rule 7080 which has been in effect since 1985. In Clay County, lakes represent a priority for sewer system compliance. Due to limited lake resources, monitoring of noncompliance septic systems on lakes is often left to established lake associations or concerned citizens.

Groundwater Most of the groundwater available to streams, springs and wells is supplied by sand and gravel aquifers near the land surface (surficial aquifers) or 100 to 300 feet below the land surface (buried aquifers). As expected, surficial aquifers are more prone to the effects of land use activities than are buried aquifers. In addition, these aquifers are connected to surface water bodies (Stoner et al. 1993). These facts have demanded the focus of groundwater quality monitoring.

Present groundwater quality in the county is thought to be of good quality, although samples collected are usually only tested for nitrates and coliform bacteria. The regional groundwater assessment conducted by the MN Geological Survey and the DNR provides much needed information about general ground water quality in Clay County. In addition, the Clay County Environmental Office offers a comprehensive water well testing program for nitrates and bacteria. The Minnesota MPCA and DNR have also been conducting a variety of groundwater testing programs in the county. In January of 2017, the Clay SWCD and MDA signed a Joint Powers Agreement to participate in Township Nitrate-Nitrogen Testing Program. 11 Townships in Clay County have been selected to participate. The goals of the project are: 1) determine current nitrate concentrations in private wells in the selected townships, 2) educate well owners on the nitrate concentration in their wells, 3) fulfill county water plans with regards to nitrates, 4) support decision making in the Nitrogen Fertilizer Management Plan.

Another area of interest is the Glacial Lake Agassiz Beach Ridge area in the eastern portion of the County. The geology of this area is composed of sand and gravel moraines and glacial outwash, thus representing an area of concern with regards to water resource contamination. Although most of Clay County is moderately susceptible to ground water contamination, the beach ridge is highly susceptible to such contamination. These areas should be designated as high priority groundwater protection areas to protect the groundwater resources present.

Leaking underground storage tanks also pose a threat to groundwater quality. The MPCA has made available to the SWCD a list of all the hazardous waste tank (above ground and underground) and spill locations known, and a list of all hazardous waste generators within Clay County. Two such sites have proven to be a major concern for the Buffalo Aquifer. In 1994 and 1995, corrective action was necessary to remediate leaking underground storage tanks at Commercial East Acres Truck Plaza, Glyndon,

MN. Terracon Environmental, Inc. implemented the removal of materials, three underground storage tanks, and 20,260 cubic yards (42,000 tons) of contaminated soil. Approximately 80 percent of the soil was treated on site for removal of petroleum hydrocarbons. Groundwater monitoring indicates that petroleum based contaminant concentrations were significantly decreased following remediation activities, but two non petroleum based constituents still remain (Terracon Environmental, Inc. 1995). A similar situation occurred with the Truckers' Inn facility. Three consecutive small petroleum based spills reported to the MPCA in 1998 prompted designation of the site as a leak site followed by onsite investigations by the MPCA. These investigations lead to the discovery of significant levels of petroleum contamination to a depth of 25 feet. Dissolved phase contaminant was found at greater depths within the Buffalo Aquifer. Remediation efforts using "free product recovery" (pumping) were somewhat successful, but excavation was required to remove the petroleum tanks and more contaminated material. In 2003, the landowner offered to demolish a portion of the infrastructure to facilitate excavation of the contaminated soil. Presently, pockets of contamination still exist, but widespread contamination is no longer an issue at this site. There are limited concerns about diesel contamination in existing and newly drilled wells, but the MPCA believes this may be due to drilling methods used in the installation of new wells. These sites have been closed but the potential for similar contamination is still present.

Major concerns for the contamination of groundwater include gravel mining, improperly sealed abandoned wells, industrial development, major highways, petroleum pipelines, railroads, sewage lagoons, and land use on sensitive groundwater areas. As a result of the mandates of the Federal Safe Drinking Water Act and Minnesota Groundwater Protection Act (1989), public water supply wells need to have a wellhead protection plan (WHP) delineating areas of enhanced protection for wells. Wellhead Protection Plans have been completed for the cities of Moorhead, Barnesville, Georgetown and Glyndon. The cities of Comstock, Sabin and Hawley are in the process of updating their Wellhead Protection Plans. Use the following link to view a full list of the Public Water Supply sites in Clay County.
(http://www.health.state.mn.us/divs/eh/water/swp/swa/)

Feedlots Feedlots present a concern for surface water quality (and groundwater quality) if manure is improperly stored, handled, or disposed of. Nutrients from manure can lead to excessive plant and algal growth (eutrophication), oxygen depletion, and toxicity in surface water. In groundwater, nitrates and pathogens can cause negative animal and human health effects. Agricultural waste management systems can be very effective in reducing pollution from feedlots. In essence, these systems prevent runoff from carrying pollutants to surface water bodies. Similarly, if constructed properly, seepage of pollutants into the groundwater is minimal. The Clay SWCD has been delegated the responsibility for the County Feedlot Program by Clay County. According to the MPCA, there are 105 permitted feedlots in Clay County. Of these, 84 have been inspected for compliance with MPCA Animal Feedlot Rules (Chapter 7020). The remaining feedlots are scheduled to be inspected by December 2019.

NATURAL RESOURCES ENHANCEMENT AND PROTECTION

There are also concerns regarding land use and its impacts on natural areas including prairie resources, wetland resources, and water (surface and groundwater) resources. These natural areas have been dramatically reduced in the past 150 years. Due to the alterations since presettlement, these remaining natural areas are critical for both aesthetic and ecological reasons. These areas provide necessary cover and forage for all types of wildlife and in some cases provide migration corridors through the County. With this in mind, "marginal land", land adjacent to water bodies, and land within the Lake Agassiz Beach Ridge should be prioritized for conservation and tax exemption programs to protect and preserve their uniqueness and value. It is paramount to comprehensively weigh the costs and benefits of altering these lands.

Currently, a small percent of the eligible cropland in Clay County is enrolled in a state or federal conservation program. Similarly, the total amount of land considered to be "habitat" is nearly twenty three percent of the total land area. This includes conservation lands, lands under federal and state easement, lands under federal and state ownership, and all other natural lands. The potential loss of conservation lands, specifically lands in the conservation reserve program (CRP), is of primary concern. It will be necessary to track the status of these lands and, if the CRP contracts are not renewed, encourage the landowners to enroll the land in other available conservation agreements.

Considering outdoor recreation, Clay County was, at one time, prime hunting for waterfowl and upland game. Further, remaining prairies, wetlands, woodlands and riparian corridors provide wildlife viewing, as depicted, for example, in the Pine to Prairie Birding Trail (http://www.mnbirdtrail.com/). Hunting and wildlife viewing can bring additional revenue to the County, and natural areas can provide secondary benefits by reducing wind and water erosion thereby maintaining water quality. In addition, restoration of wetland habitat may, in some cases, protect and improve groundwater recharge in the eastern portion of the County.

Two relatively recent efforts make decisions regarding remaining critical habitat easier. These include the Minnesota County Biological Survey and the Lake Agassiz Beach Ridge Forum Reports. The Minnesota County Biological Survey, completed in 1997, (http://www.dnr.state.mn.us/mbs/index.html) details sensitive natural habitats of rare plants and animal species and will aid Clay County in making responsible decisions regarding Minnesota's rare plant and animal species. The Lake Agassiz Beach Ridge Forum Final Report and the Felton Prairie Stewardship Plan illustrates the conflict between prairie remnant protection and gravel mining. Of the 21,310 acres identified as having prairie resources in Clay County, 14,290 acres are of medium to high significance (DNR-Clay County Beach Ridges Forum 1997). Two prairies of significance reside in Clay County. Felton Prairie is a dry prairie that contains several endangered plants and animals. Bluestem Prairie is located south of Highway 10 near Buffalo River State Park and is a prime example of Tallgrass Prairie. As it stands, the last prairie remnants in Clay County are in close proximity to active gravel mining

locations.

When considering wildlife, one can also consider aquatic organisms and their associated recreational value. The rivers and lakes of Clay County have significant fishery value. For instance, the Red River of the North is classified as a Class II stream by the Minnesota DNR. Fish taken for sport include walleye, northern pike, sauger, crappie, yellow perch and channel catfish. Similarly, the Buffalo River (including the South Branch) is classified as a Class IV stream where redhorse, white suckers, and bullheads (with occasional walleye and pike) are commonly sought. It must also be stated that tributaries of these rivers serve as nurseries for many aquatic species. Thus, protection/maintenance of these fisheries is critical to Clay County and much deserved.

Clay County passed a resolution in 2014 for Aquatic Invasive Species (AIS) Prevention Aid. With this resolution Clay County will partner with the Red River Basin Commission (RRBC) to participate in their Northwest Regional Aquatic Invasive Species Prevention Project. AIS prioritization reports have been completed by the RRBC and RMB Labs for both the Buffalo and Wild Rice Watersheds. Recommendations from these reports will be utilized by Clay County for management activities.

ASSESSMENT OF FLOOD DAMAGE REDUCTION

Flooding and flood related damages plague the Red River Basin with high frequency. Flood damage reduction projects proposed by Watershed Districts in the 1980s and 1990s alarmed natural resource agencies as to the cumulative effect of these proposed projects on the environment. The US Army Corps of Engineers and MN Department of Natural Resources initiated a joint Environmental Impact Statement (EIS) questioning these cumulative effects on the Red River Basin ecosystem (USCOE and MNDNR, 1995). The EIS was subsequently challenged in state district court by the watershed districts and the Red River Watershed Management Board. In an effort to avoid costly, time consuming litigation, the MN Legislature authorized funding for a “Mediation Process” to resolve the conflicting issues of flood control in May 1997. The mediation process was designed to address issues in a positive, partnership-building effort, and provide alternatives that result in enhanced flood control and equally enhanced environmental benefits. The process was also designed to streamline the environmental permitting process by creating “project teams” for each watershed district. The project teams are comprised of federal, state and local agency representatives, landowners, and interest group representatives that meet regularly to discuss issues and potential projects. Everyone is involved from the beginning to the end of project development – something severely lacking prior to this process.

Drainage as it relates to Flood Damage Reduction Given the topography and hydrology of Clay County, drainage, both natural and constructed is an essential part of life. Although natural drainage occurs in Clay County, extensive drainage systems were

constructed in the early 1900's and again in the 1940's and 1950's to enhance natural drainage of prime heavy soils. These ditches are typically oriented in an east-west direction, perpendicular to the Red River of the North. Without the constructed drainage system, agriculture would not be the economic base of the Red River Valley.

Drainage systems within the County take two forms - natural and human constructed. Further, constructed drainage systems can either be public or private. Such systems provide drainage for agriculture, industry, residential development, streets, roads, airports and railroads. Considering the topography of Clay County, drainage problems are most prevalent in the western portion of the County where natural drainage does not convey water completely enough during accelerated snowmelt in the spring and/or heavy rainfall to mitigate crop and infrastructure damage. The first consideration determining the productivity capacity of tillable land has been its natural drainage or access to constructed drainage. Where drainage systems are not present or are not maintained, crop damage is likely and the regional economy can be negatively impacted. Drainage systems also function to protect urban areas from infrastructure damage. Without such systems, such urban areas would be subject to severe flood damage.

Management of all public ditches in Clay County falls under Watershed District jurisdiction. Previously, the County managed several public ditches, but the last transfer of management to the Watershed Districts occurred in 2000. The Watershed Districts have jurisdiction over all improvements to existing public ditch projects and new public ditch projects as well. Such projects are assessed to those landowners who benefit, or whose land experiences an increase in market value, due to the project. Adequate drainage system design includes proper sediment and erosion control which reduces future maintenance. New public ditch projects must comply with Federal and State laws to better reflect the values and priorities of society and address the physical, biological and chemical integrity of the affected area. Watershed districts may elect to have jurisdiction over public ditches as spelled out in the 2015 Buffer and Soil Loss Law (Minn Stat. 103F.48)

ASSESSMENT OF EROSION

Sediment produced by non-point source pollution has adversely affected water quality in nearly all of the major rivers in Clay County. Agricultural drainage, streambank erosion, overland flooding, and wind erosion has contributed to the amount of sediment entering these watercourses. Detrimental effects associated with wind and water erosion include sedimentation of streams, public drainage ditches and road ditches, soil loss, nutrient loss, crop loss, loss of agricultural chemicals, and habitat losses. All of these factors translate to increased costs to the citizens and landowners of Clay County.

There are several conservation practices that can be established to reduce the effects of cropland erosion. Conservation tillage, specifically no-till and mulch till, is the best available means of reducing erosion on a “field scale”. In addition, streambank buffer strips, promoting field windbreak establishment, restoring wetlands, changes in tillage practices, cover crops and soil health can reduce the amount of sediment entering surface waters and road ditches. Further, these practices will enhance the soil quality of a finite resource.

In 2015 the Legislature passed a new Buffer and Soil Loss Law (Minn. Stat. 103F.48). The intent of the law is to protect state water resources from erosion and runoff pollution, stabilize soils, shores and banks, and to protect or provide riparian corridors. The law requires a 50 ft. average, 30 ft. minimum buffer width, or the state shoreland standards, whichever is more restrictive, on Public Waters as identified by the MN DNR. These buffers need to be established by November 1, 2017. The law also requires a 16.5 ft. buffer be established on all public drainage systems by November 1, 2018. In both cases the buffer requirements are evaluated on a parcel by parcel basis,

The Clay SWCD has utilized the DNR maps to establish a list of landowners affected by this new law. Individual parcels were identified and evaluated using GIS software and a list of compliant, non-compliant and undetermined parcels was created. Non-compliant and undetermined parcel landowners have been contacted through several mailings to notify the landowner they may be out of compliance after November 1, 2017. The Clay SWCD continues to work with landowners to establish buffers or alternative practices that provide the same water quality benefits as the buffer.

The BRRWD has indicated its intent to systematically evaluate the public drainage systems in the district and establish the 16.5 ft. buffers as necessary. The WRWD has not taken action at this time.

ONGOING ACTIVITIES

The County is responsible for the SSTS and Shoreland programs and the SWCD is responsible for the WCA and Feedlot programs along with completing annual reporting for each program. The SWCD will continue to work with landowners to meet compliance with Buffer and Soil Loss Law and document buffer compliance in BuffCAT for reporting purposes.

ADDITIONAL ACTIVITIES

The Clay SWCD will work to develop an outreach program that informs the citizens of Clay County about the goals and objectives of this plan. Groups that maybe targeted include but are not limited to: Certified Crop Advisors, agricultural groups, agricultural lenders.

GOALS, OBJECTIVES AND ACTION ITEMS

The Clay County LWM Advisory Committee has developed the following goals, objectives, and action plans to address the priority concerns identified. They also identified implementation and enforcement strategies, and identified new regulations or programs to ensure that the quantity and quality of water resources would be adequate to meet the needs of future generations.

The following goals, objectives, and actions described relate directly to the priority concern assessments which define the issues or problem areas. GOALS and OBJECTIVES outline broad directions the county wishes to pursue to protect their resources. The ACTION ITEMS describe specific measures that the County will implement with assistance from appropriate federal, state, and local organizations, to achieve the goals and objectives. In all cases, action items are to be achieved in the next five years, unless otherwise specified. A list of acronyms used to identify lead agencies/groups is provided in the Introduction.

The following information is a summary of the estimated goals, objectives and expenses needed to fully implement the Clay County Local Water Management Plan. These estimates are for planning purposes only and are not intended to be a commitment by Clay County or partner agencies. Action items completed will be dependent upon funding received through various grants and other sources.

An overall goal that addresses <u>all</u> of the following priority concerns is to continue the administration and enforcement of existing rules and regulations that govern natural resources management issues, environmental health issues, planning and zoning issues, and development issues, and to improve the local government coordination of the enforcement of these regulations.

PRIORITY CONCERN: WATER QUALITY

GOAL 1: *Address the Impaired and Degraded Waters within Clay County*

OBJECTIVE A. **Actively participate with MPCA in the development and implementation of Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategy (WRAPS) plans for impaired waters of Clay County.**

Actions:

1. Provide technical assistance and best professional judgment during TMDL and WRAPS study development planning process by participating in stakeholder meetings and attending public hearings.
2. Implement TMDL and WRAPS plan within the Buffalo River, Upper Red River and Wild Rice River watersheds through participation in the Project Team process.

OBJECTIVE B. **Aggressively market available conservation programs and low interest loan programs in the watersheds of impaired waters especially in areas spelled out by the RAL included in the BRRWD Watershed Management Plan.**

Actions:

1. Inventory and map all conservation program contracts and easements present within these watersheds by 2026. (update yearly as data is available)
2. Inventory subsurface sewage treatment systems (SSTSs) in these watersheds to determine their status (failing or not-failing). (3 Townships per years)
3. Contact all landowners within these watersheds via mailings, public meetings, and tax statements to encourage conservation program and/or low interest loan program enrollment. (One meeting/mailing per year)
4. Encourage landowners to participate in the MN Agricultural Water Quality Certification Program (MAWQCP)

OBJECTIVE C. **Attempt to reduce the extent of impairment and degradation of impaired waters by 2026.**

Actions:

1. Utilize existing and ongoing research efforts to determine in-stream versus introduced (from adjacent land uses) sources of impairment.
2. Work with landowners to meet Buffer and Soil Loss Law through buffer establishment or alternative practices. (100% compliance)

GOAL 2: *Address the issue of degrading water quality of surface waters in Clay County to limit future impacts of surface water quality*

OBJECTIVE A. Continue support of the *River Watch* Program.

Action:

1. Continue River Watch Programs with participating schools. Promote program in additional schools
2. Provide funding support for existing River Watch Teams - $500 per year as funding allows
3. Publicize River Watch efforts via the SWCD and County website and the Clay SWCD newsletter articles
4. Encourage Cities to enforce Shoreland Regulation within City Limits – Promote through River Keepers.

OBJECTIVE B. Improve water quality in watersheds adjacent to impaired waters through the establishment of Best Management Practices (BMPs)

Actions:

1. Enroll eligible land in CRP, CCRP, CREP, RIM and WRE practices as acreage is available. (Meet with 20 landowners per year)
2. Establish field and farmstead windbreaks throughout the county. (10/year)
3. Utilize new conservation programs created under the existing Farm Bill

GOAL 3. *PROTECT GROUNDWATER QUALITY*

OBJECTIVE A. Complete groundwater protection planning strategies where they are lacking

Actions:

1. Assist in the development of Wellhead Protection Plans and Source Water Assessment Plans for communities lacking such plans
2. Assist in the administration of Wellhead Protection Plans and Source Water Assessment Plans
3. Employ Wellhead Protection and Source Water Assessment Plan information utilizing delineation of recharge areas and Drinking Water Supply Management Areas to substantiate changes in land use (zoning and development ordinances, enrollment in conservation programs) to protect the groundwater resources
4. Encourage and assist LGU's in developing rules/ordinances to limit certain land uses that threaten groundwater quality and quantity
5. Encourage and assist Moorhead Public Service in developing an Aquifer Management Plan to insure an adequate future water supply

OBJECTIVE B. Track land uses that threaten groundwater quality

Actions:

1. 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 (1-2 townships per year)
2. Hold one public outreach event to educate/inform owners about the appropriate methods of reclaiming/restoring a gravel pit
3. Utilize GIS and online applications to develop maps of areas throughout the county that are highly susceptible to groundwater contamination (create and distribute maps to one township per year)

OBJECTIVE C. Continue the Abandoned Well Sealing Cost Share Program

Actions:

1. Reimburse eligible landowners who have their abandoned well sealed by a licensed well driller at 50 percent cost share up to $1000 - per available funds (5 per year)
2. Encourage and assist MPS to develop a permanent drought management plan.

PRIORITY CONCERN: NATURAL RESOURCE ENHANCEMENT AND PROTECTION (NRE&P)

GOAL 1: *Focus Natural Resource Enhancement and Protection (NRE&P) by geomorphic regions*

OBJECTIVE A. Utilize NRE goals from Watershed District plans for the Glacial Lake Agassiz lake plain, beach ridges, and moraine geomorphic regions

Actions:

1. Review existing USFWS, DNR and TNC planning/prioritization documents to ensure consistency in habitat management and acquisition goals
2. Participate in Watershed District Project Teams to discuss habitat management goals by region
3. Incorporate the goals of the Felton Prairie Stewardship Plan to protect wetlands and calcareous fens along the Agassiz Beach Ridge area.

OBJECTIVE B. Develop an interagency strategy to enhance existing, large acreages natural resource features in Clay County (Felton Prairie, Bluestem Prairie and Barnesville WMA) through acquisitions, conservation program enrollment, or enhancement of adjacent working lands

Actions:

1. Encourage USFWS, DNR and TNC to hold workshops on “Landowner Options” available to landowners adjacent to priority natural resource sites (one workshop per year)
2. Utilize GIS, online applications and “Drained Wetland Inventory” for Clay County developed by the USFWS
3. Work with Prairie Conservation Plan Local Technical Team to provide specific goals for collaboration of water resource concerns in the county.

GOAL 2: *Protect and enhance riparian corridors and buffers to allow habitat connections and wildlife migration*

OBJECTIVE A. Investigate enforcement of Shoreland Ordinance provisions that pertain to a required buffer on lands adjacent to DNR Public Waters

Actions:

1. Advocate enforcement of Shoreland Regulations – coordinated approach of marketing conservation programs as a means of compliance
2. Continue to work with landowners to establish buffers or alternative practices that provide the same water quality benefits as the buffer.

GOAL 3: *Challenge increased NRE&P involvement from all landowners in the county*

OBJECTIVE A. Target homeowners and small acreage landowners to increase small scale conservation efforts and purchasing habits that promote NRE&P

Actions:

1. Provide information on the County and SWCD website for Backyard Conservation and Urban Conservation to encourage a conservation ethic in all county landowners (3 workshops per year)
2. Provide website links to other conservation related organizations and agencies.

OBJECTIVE B. Work with farm operations to increase the participation in conservation programs

Actions:

1. Create a work group of operators, agricultural interest groups and financiers to determine the impediment for their enrolling lands into conservation practices
2. Using the information derived from Action 1, work with operators to enroll land into conservation programs such as Soil Health and Cover Crops (5 landowners per year)

GOAL 4: *Aquatic Invasive Species management and control*

OBJECTIVE A. Partner with the Red River Basin Commission to participate in their "Northwest Regional Aquatic Invasive Species Prevention Project

Actions:

1. Provide leadership in the fight against Aquatic Invasive Species by developing proactive solutions aimed at educating and empowering local citizens.

PRIORITY CONCERN: FLOOD DAMAGE REDUCTION (FDR)

GOAL 1. *Commit to County and SWCD involvement in FDR process*

OBJECTIVE A. Continue involvement and county representation on Watershed District Project Teams

Actions:

1. Provide technical assistance and marketing for each Project Team project
2. Assist in FDR process at the county level by identifying and initiating small scale projects that compliment larger FDR projects
3. Provide technical assistance to P&Z for floodplain management and shoreland management in flood prone area

OBJECTIVE B. Identify Natural Resource Enhancement (NRE) opportunities for FDR projects proposed by the WRWD and BRRWD Project Teams

Actions:

1. Inventory project areas for natural resource enhancement opportunities including wetland restorations, sediment basins, buffer strips, etc.
2. Develop acreage goals for each based on results of inventories

OBJECTIVE C. Investigate issues that conflict with FDR

Actions:

1. Investigate issues of conflict/concern with FDR efforts including conflict in culvert sizing, flow velocity and fish passage.
2. Track pattern tiling to determine potential FDR issues and need for information gathering

PRIORITY CONCERN: EROSION

GOAL 1. *Address and reduce soil erosion county-wide*

OBJECTIVE A. Implement closer coordination with Farm Management Educators, Agricultural Service Groups, WD and MPCA to reach a larger number of producers

Actions:

1. Attend Adult Farm Educator meetings to present information on erosion
2. Participate a tillage workshops to promote greater use of no-till and mulch till, soil health and cover crops (1 workshop per year)

OBJECTIVE B. Increase the awareness of the negatives of soil erosion

Actions:

1. Map soils for wind and water erosion and publish on the SWCD website
2. Write one article for area newspapers) and website per year – (Example: "Costs of soil loss and Impaired waters"
3. Investigate excessive soil loss complaints and follow up with landowners violating the Soil Loss portion of the law.

OBJECTIVE C. Assess and prioritize sources of erosion including gully erosion and field inlets using PTMApp or other similar tools

Actions:

1. Utilize current and future technologies to target minor watersheds where gully erosion is prevalent and work with landowners to address the problem
2. Work with the watershed districts to address the issue of sedimentation of public ditches caused by field inlets using current and future technologies to target areas of greatest sediment loading and work with the WD and landowners to address the problem

GOAL 2. *Reduce streambank and in-stream erosion*

OBJECTIVE A. Cooperate with agencies to inventory streams and rivers for streambank stabilization needs

Actions:

1. Utilize current and future technologies determine the need for streambank and in-stream stabilization and work with agencies and landowners to correct these issues.
2. Evaluate water quality using RAL's in areas where available.

GOAL 3. REDUCE EROSION AND CONTROL SEDIMENT TRANSPORT IN ROAD DITCH RIGHT-OF-WAY

OBJECTIVE A **Work with road authority to reduce farming of road ditches**.

1. Re-establish road ditch and seed appropriate cover to remove liability of owner (Notify road authorities, assess ditches in 3 townships per year)
2. Reduce erosion and turbidity as dictated by current MPCA TMDL guidelines (10% reduction per year)

IMPLEMENTATION SCHEDULE

Priority 1 - WATER QUALITY					
GOAL 1 – Address impaired and degraded waters Objective A: TMDL and WRAPS Implementation					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	MPCA, BRRWD, SWCD	N/A	Existing staff time	2017-2026	South Branch – Buffalo, Red River
2	MPCA, BRRWD, SWCD	$100,000	Federal, state, local	2017-2026	South Branch – Buffalo, Red River
GOAL 1 – Address impaired and degraded waters Objective B: Program marketing within impaired waters watersheds					
1	SWCD, NRCS	N/A	Existing staff time	2017-2026	South Branch – Buffalo, Red River
2	EH, SWCD	N/A	Existing staff time via NRBG	2017-2021	South Branch – Buffalo, Red River
3	SWCD, NRCS, WD, EH	$1,000	NRBG, Existing staff	2017-2026	South Branch – Buffalo, Red River
4	SWCD	N/A	MN Dept Ag	2017-2026	All
GOAL 1 – Address impaired and degraded waters Objective C: Reduce impairment and degradation by 2026					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	MPCA, BRRWD, SWCD	N/A	Existing staff time	2017-2021	South Branch – Buffalo, Red River
2	SWCD, BRRWD, WRWD, County	Unknown	State, local	2017-2021	All

GOAL 2 – Address Degraded Waters to limit future impacts of water quality Objective A: Support River Watch					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD	N/A	Existing staff time	2017-2026	All
2	SWCD, BRRWD	$2,500	NRBG, local	2017-2026	All
3	SWCD	N/A	Existing staff time	2017-2026	All
4	River Keepers, P & Z, SWCD	N/A	Existing staff time	2017-2026	All
GOAL 2 – Address Degraded Waters to limit future impacts of water quality Objective B: Improve water quality through BMP establishment					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	NRCS, SWCD	$10 mill	Federal, state)	2017-2021	All
2	SWCD, NRCS	$20,000	State Cost Share, Federal	2017-2026	All
3	NRCS, SWCD	Unknown	Federal, state, local	2017-2026	All

GOAL 3 – Protect groundwater quality Objective A: Complete protection strategies where lacking					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, EH, NRCS	N/A	Existing staff time	2017-2026	All
2	SWCD, EH, County	N/A	Existing staff time	2017-2026	All
3	Cities, Townships, County	N/A	Local	2017-2026	All
4	Townships, P&Z, SWCD, Cities	N/A	Existing staff time	2017-2026	All
5	SWCD, MPS,DNR	N/A	Existing staff time	2017-2021	All
GOAL 3 – Protect groundwater quality Objective B: Track land uses that threaten groundwater quality					
1	P&Z, SWCD	$2,500	NRBG, local	2017-2026	All
2	P&Z, SWCD, WD	$10,000	Local, NRBG	By 2026	All
3	SWCD, P&Z, GIS	N/A	Existing staff	2017-2026	All
GOAL 3 – Protect groundwater quality Objective C: Continue Abandoned Well Sealing cost share program					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, BRRWD	$10,000	NRBG, Local	2017-2026	All
2	SWCD, MPS	N/A	Existing staff time	2017-2026	All

Priority 2 - NATURAL RESOURCES ENHANCEMENT & PROTECTION (NRE&P)					
GOAL 1 – Focus NRE&P efforts by geomorphic regions Objective A: Consolidate agency planning/prioritization efforts by geomorphic regions					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	All applicable agencies	N/A	Existing staff time	2017-2021	All
2	All applicable agencies	N/A	Existing staff time	2017-2026	All
3	All applicable agencies	N/A	Existing staff time	2017-2026	All
GOAL 1 – Focus NRE&P efforts by geomorphic regions Objective B: Program marketing and targeting adjacent to existing natural areas					
1	All applicable agencies	$2,500	Existing staff time	2017-2021	All
2	SWCD, BWSR, USFWS, PF, DU, NRCS	$30,000	Federal, state, local private	2017-2026	All
3	All applicable agencies	N/A	Existing staff time	2017-2026	All

GOAL 2 – Protect and enhance riparian corridors and buffers Objective A: Investigate enforcement of the Shoreland Ordinance					
1	P&Z, SWCD, NRCS	N/A	Existing staff time	2017-2026	All
2	SWCD, WD, County	N/A	Existing staff time	2017-2021	All

GOAL 3 – Challenge increased NRE&P involvement from ALL landowners in the County Objective A: Target small acreage landowners and homeowners					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, MIS	N/A	NRBG, Local	2017-2021	All
2	SWCD, MIS	N/A	Existing staff time	2017-2026	All
GOAL 3 – Challenge increased NRE&P involvement from ALL landowners in the County Objective B: Work with large scale farm operations to enhance participation with conservation programs					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	ASG, FME, SWCD	N/A	Existing staff time	2017-2026	All
2	Producer, SWCD, NRCS	Unknown	Federal, State	2017-2026	All

GOAL 4 – Aquatic Invasive Species management and control Objective A: Partner with the Red River Bain Commission in Northwest Regional Aquatic Invasive Species Prevention Project					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	P&Z	$18,000	State	2017-2021	All

Priority 3 - FLOOD DAMAGE REDUCTION (FDR)					
GOAL 1 – Commit to County involvement in the FDR process Objective A: Continue involvement and representation on Watershed District Project Teams					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, NRCS	N/A	Existing staff time	2017-2026	All
2	SWCD, NRCS	N/A	Existing staff time	2017-2026	All
3	P&Z, SWCD, WD	N/A	Existing staff time	2017-2026	All
GOAL 1 – Commit to County involvement in the FDR process Objective B: Identify natural resource enhancement opportunities for FDR projects					
1	SWCD, NRCS	N/A	Existing staff time	2017-2026	All
2	SWCD, NRCS, WD	N/A	Existing staff time	2017-2021	All
GOAL 1 – Commit to County involvement in the FDR process Objective C: Investigate issues that conflict with FDR strategies					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	WD, SWCD, BWSR	N/A	State, local	2017-2026	All
2	WD, NRCS, SWCD	N/A	Local, Federal, State	2017-2026	All

Priority 4 - EROSION					
GOAL 1 – Address and reduce soil erosion county-wide Objective A: Work with Farm Management Educators and Ag Service Groups to reach more producers					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, NRCS	N/A	Existing staff time	2017-2026	All
2	SWCD, Ext, FME, ASG, NRCS	$2,000	Local, donations	2017-2026	All
GOAL 1 – Address and reduce soil erosion county-wide Objective B: Increase awareness regarding the detriments of soil erosion					
1	SWCD, NRCS	N/A	Existing staff time	2017-2021	All
2	SWCD	N/A	Existing staff time	2017-2026	All
3	SWCD, County, BWSR, WD, NRCS	N/A	Local, State, Federal	2017-2026	All
GOAL 1 – Address and reduce soil erosion county-wide Objective C: Address point sources of erosion including gully erosion and field inlets					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	SWCD, NRCS, WD, MDA	N/A	FBA, Local, Federal	2017-2026	All
2	WD, SWCD, BWSR, MDA	N/A	State grants	2017-2026	All

GOAL 2 – Reduce streambank and in-stream erosion Objective A: Cooperate with agencies to inventory streams/rivers for streambank stabilization needs					
Actions	**Primary Responsibility**	**Cost**	**Potential Funding Sources**	**Duration**	**Watershed**
1	DNR, SWCD, WD, NRCS	N/A	Existing staff time	2017-2026	All
2	WD, SWCD, MPCA	N/A	Existing staff time	2017-2026	All

Goal 3 – Reduce erosion and sediment transport in road ditch right of way Objective A: Work with road authority to reduce farming on road right of way ditch					
1	County, Twp, WD, SWCD	N/A	Existing staff time	2017-2026	All
2	County, Twp, WD, SWCD	N/A	Existing staff time	2017-2026	All

PAST ACCOMPLISHMENTS OF LOCAL WATER MANAGEMENT

The following is a sampling of accomplishments through the Clay County Local Water Management Plan

- Provided educational articles pertaining to water quality and wells
- Inventoried and prioritized abandoned wells and other pollution sources in 27 townships
- Provided cost-share funding of over 255 high priority abandoned wells totaling over $37,500 in cost share funds to Clay County citizens
- Assisted in funding the removal of nuisance beaver and beaver structures (prior to 1998)
- Hosted collections for waste agriculture chemical containers
- Supported waste pesticide collection
- Completed three streambank erosion prevention projects on the Buffalo River
- Provided funding to paint/decal storm drains with “Drains to River” warning to deter dumping of hazardous waste into storm drains
- Inventoried feedlots and underground storage tanks within the county
- Completed a well nitrate study in a 30 plus square mile portion of Clay County including Keene, Goose Prairie, Cromwell and Flowing townships
- Completed digitization of Clay County Detailed Soils Study into ArcView coverage and acquired digital aerial photo CDs of FSA photography for Clay County
- Acquired up-to-date computer equipment for County agencies (Planning, Health, SWCD) to allow utilization of new technologies that feature digital information
- Updated County zoning ordinance provisions pertaining to feedlots to reduce potential for pollution of surface waters
- Represented Clay County on the MPCA Red River Basin Water Quality Plan Committee
- Represent Clay County on the Wild Rice Watershed District Project Team
- Represent Clay County on the Buffalo – Red River Watershed District Project Team
- 1998 - Provided $13,800 of pass through funding for two producers with large acreage of CRP adjacent to native prairie. These producers were offered increased cost share funding to plant a diverse mix of native grasses instead of tame grass mixes. (Glacial Lake Agassiz Interbeach Project – Grassland Stewardship)
- The County’s GPS equipment is used to calculate the acreage and to map CRP buffer strips, wetlands (existing and restored), and to map abandoned wells. GIS is used on a daily basis to locate key features related to Water Management and Wetland Conservation.
- Provided $5,000 cost share for the digitization of the Clay County Soil Survey

- Secured Clean Water Legacy grant for Wolverton Creek / Comstock Coulee, in the amount of $289,000 to: install 13 rock riffles, 4 side inlet pipes and provide incentive payments to landowners to establish 28 acres of buffer strips along Coulee. Phase II of project includes 9 streambarbs and 1 rock riffle. Joint project between Clay SWCD, Wilkin SWCD, Wilkin County and BRRWD.
- Secured Clean Water Legacy grant for the Lower Wild Rice River Turbidity project in the amount of $175,000 to: provide incentive payments to landowners to establish vegetative buffer strips, sediment control basins and side inlet pipes. Joint project between Clay SWCD, Becker SWCD, Mahnomen SWCD, Norman SWCD and WRWD
- Provided funding to area schools to assist with busing 4th graders to River Keeper's Water Festival

APPENDIX

2012 Impaired and Assessed Streams

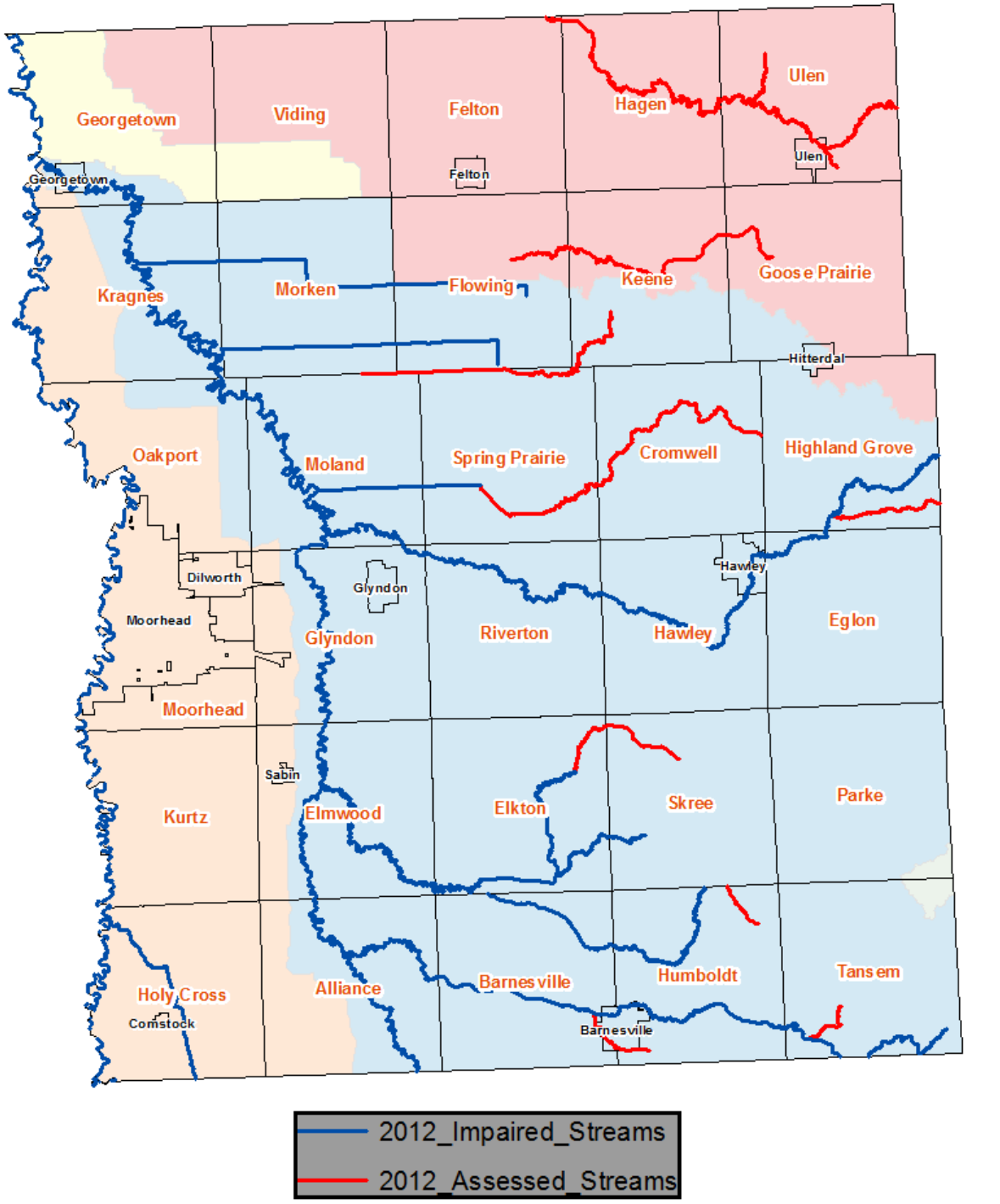


Figure 1

2012 Impaired and Assessed Lakes

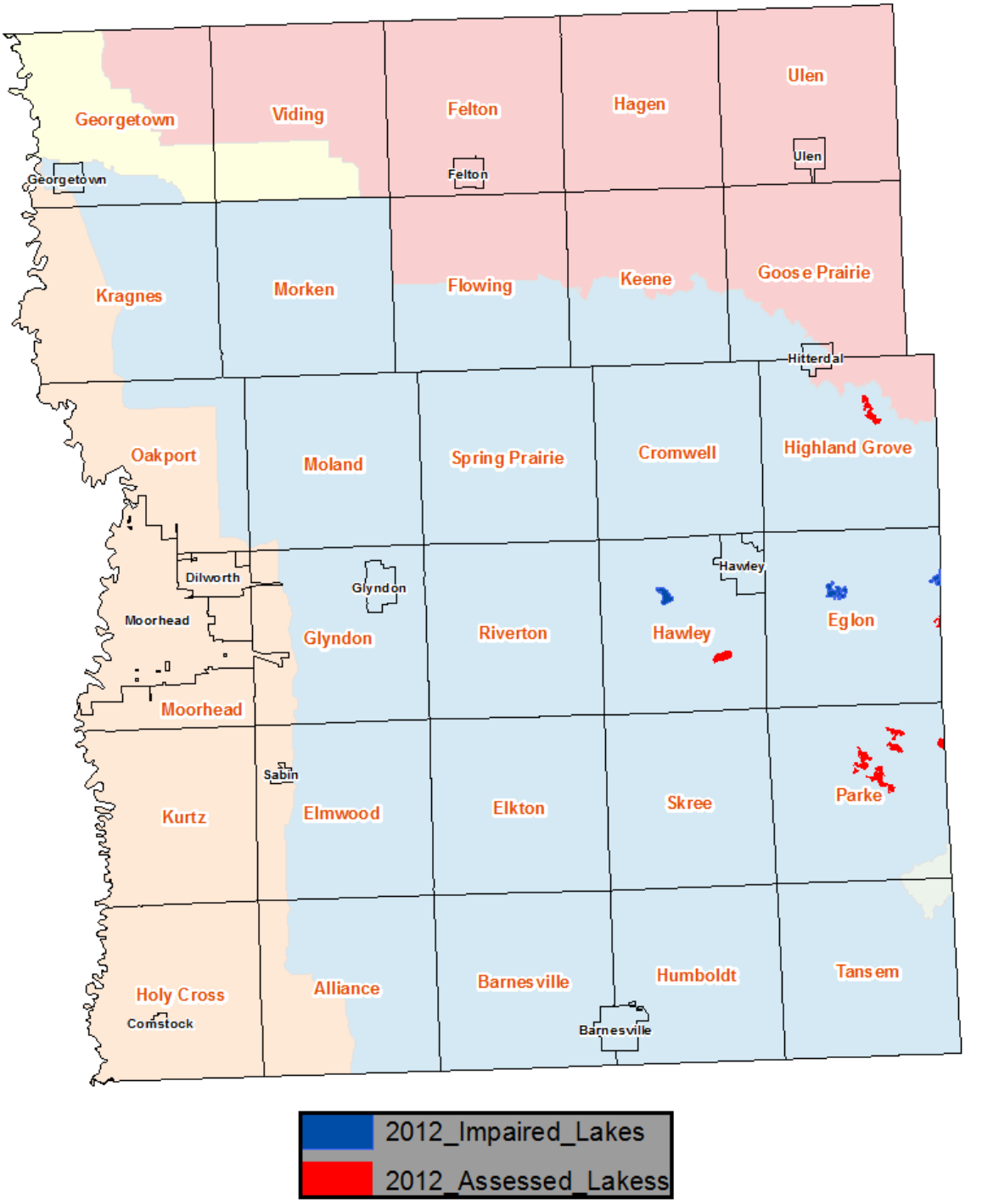


Figure 2

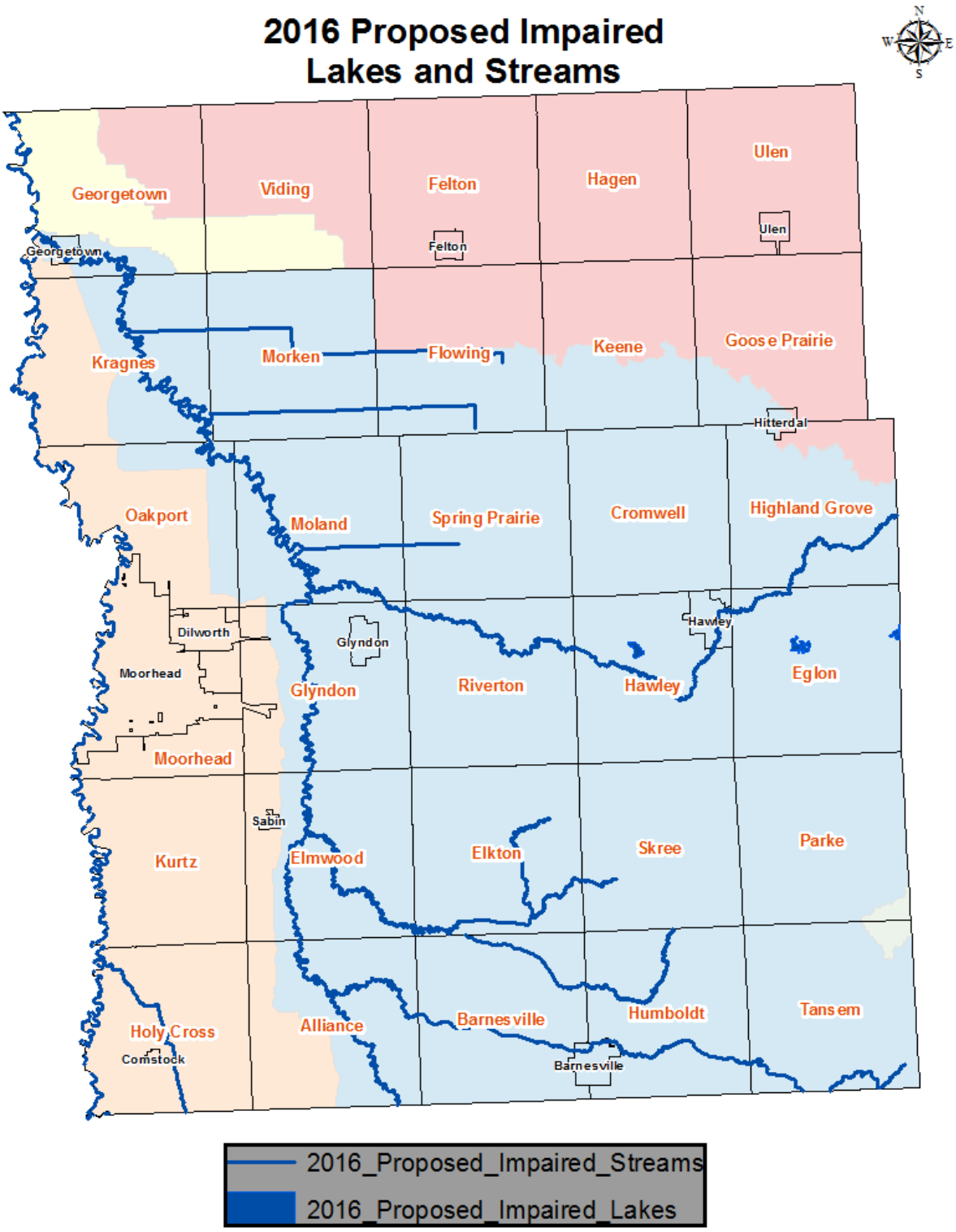

2016 Proposed Impaired
Lakes and Streams
N
W
E
S
Georgetown
Viding
Felton
Hagen
Ulen
Georgetown
Felton
Ulen
Kragnes
Morken
Flowing
Keene
Goose Prairie
Hitterdal
Oakport
Moland
Spring Prairie
Cromwell
Highland Grove
Dilworth
Glyndon
Hawley
Moorhead
Glyndon
Riverton
Hawley
Eglon
Moorhead
Sabin
Kurtz
Elmwood
Elkton
Skree
Parke
Holy Cross
Comstock
Alliance
Barnesville
Humboldt
Tansem
Barnesville
2016_Proposed_Impaired_Streams
2016_Proposed_Impaired_Lakes

Figure 3

2017 Aquifer Vulnerability

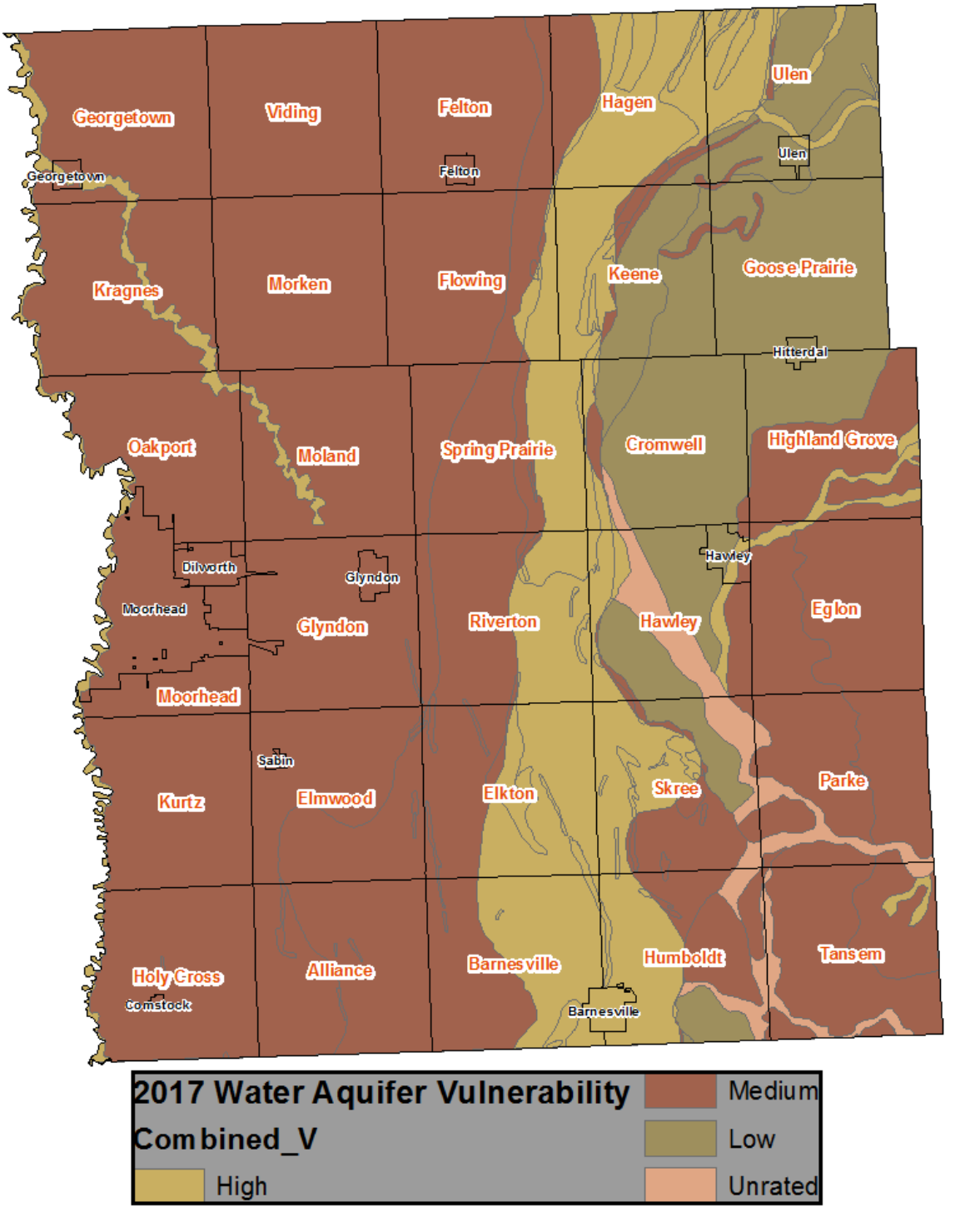


Figure 4

Drinking Water Supply Areas

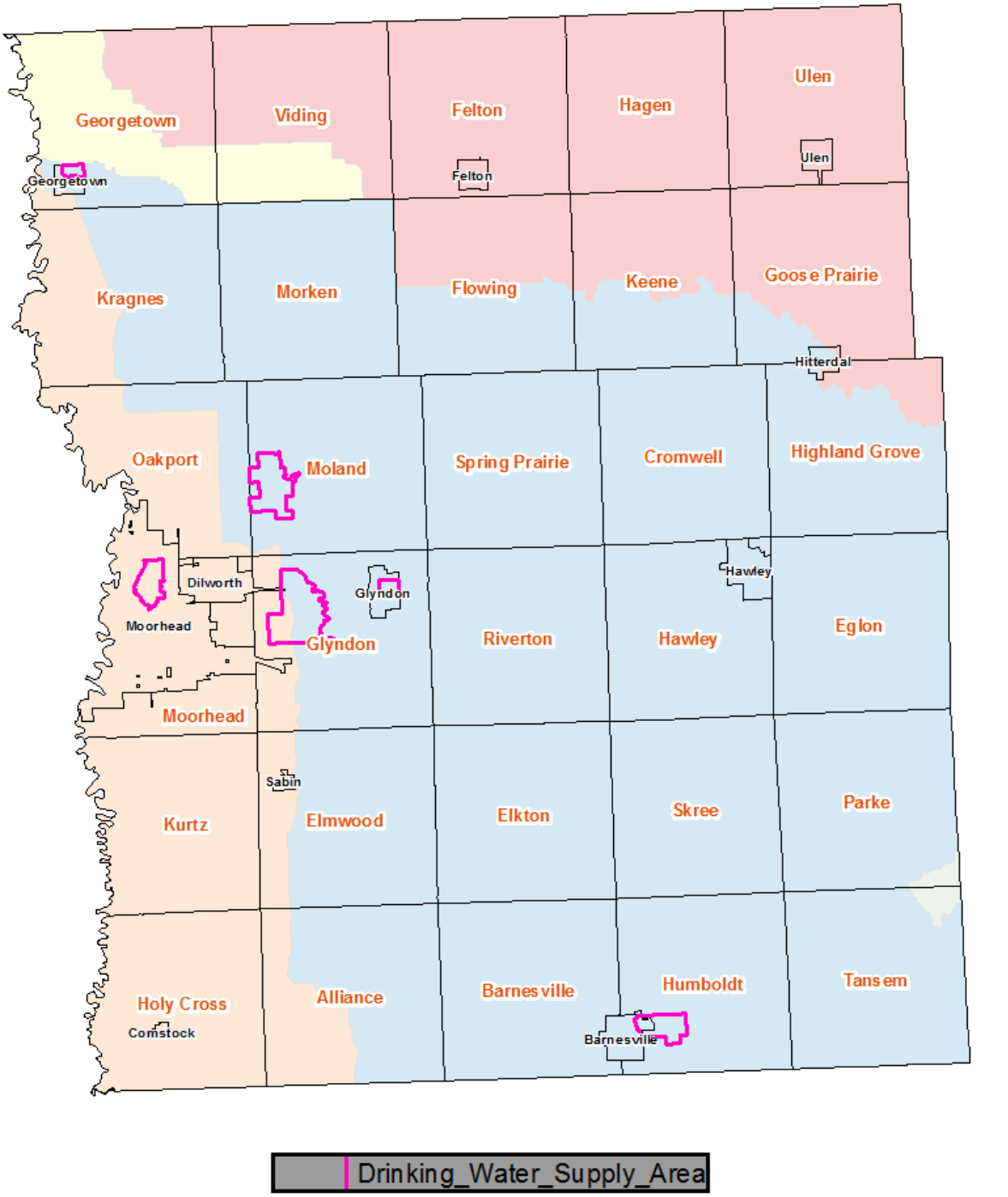


Figure 5

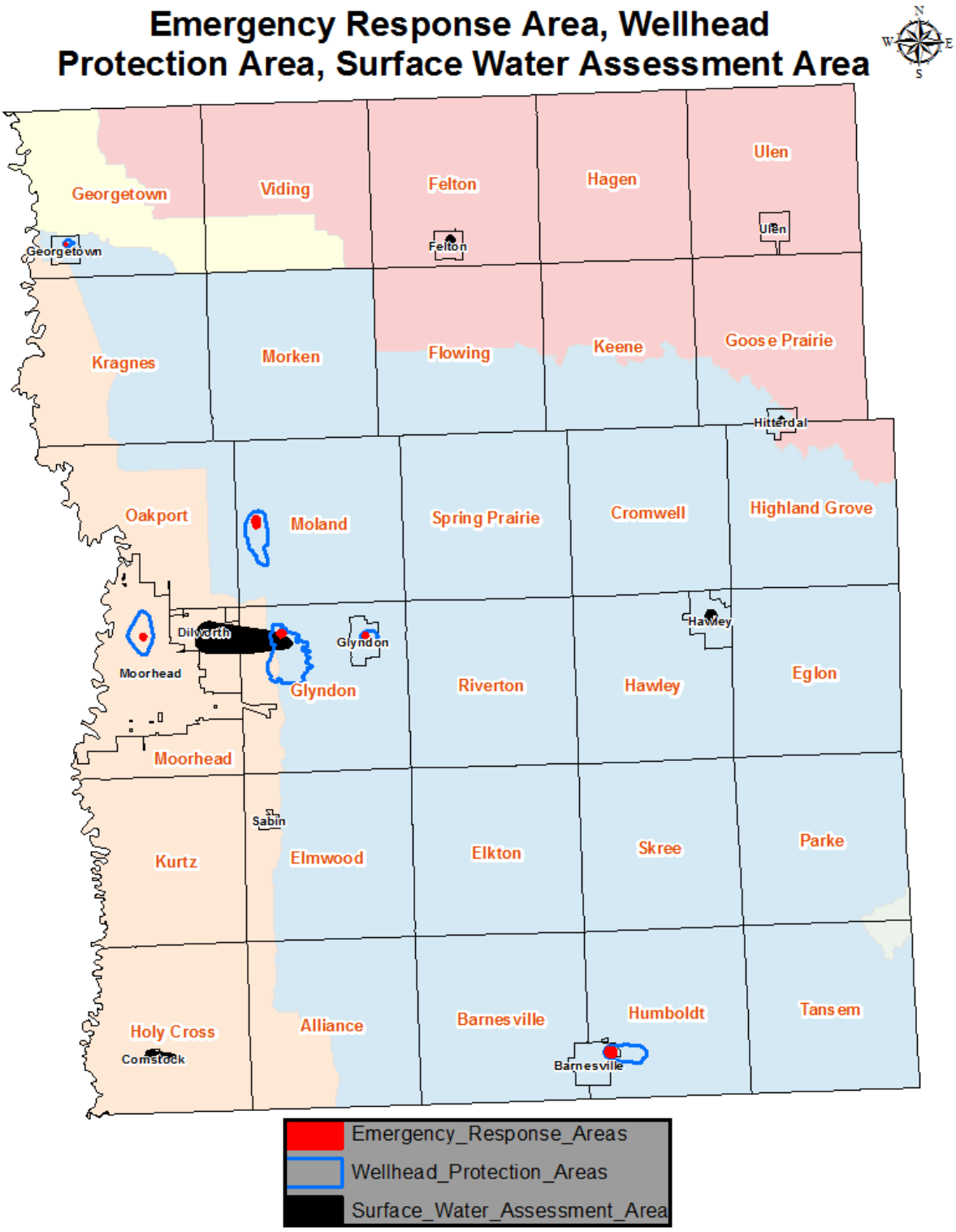

Emergency Response Area, Wellhead Protection Area, Surface Water Assessment Area
N
W
E
S
Georgetown
Viding
Felton
Hagen
Ulen
Kragnes
Morken
Flowing
Keene
Goose Prairie
Hitterdal
Oakport
Moland
Spring Prairie
Cromwell
Highland Grove
Dilworth
Glyndon
Hawley
Moorhead
Riverton
Eglon
Sabin
Kurtz
Elmwood
Elkton
Skree
Parke
Holy Cross
Alliance
Barnesville
Humboldt
Tansem
Comstock
Emergency_Response_Areas
Wellhead_Protection_Areas
Surface_Water_Assessment_Area

Figure 6

Presettlement Vegetation

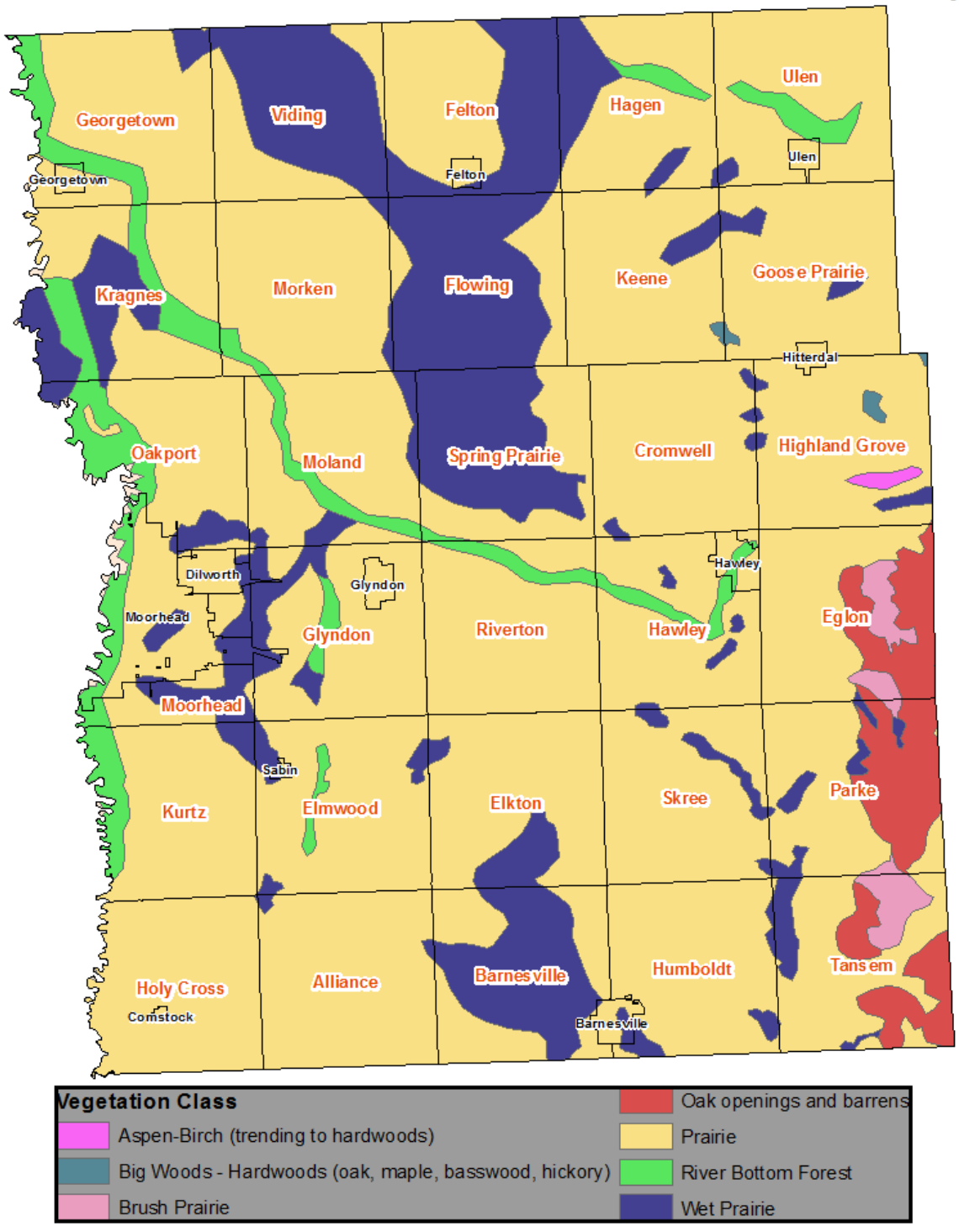


Figure 7

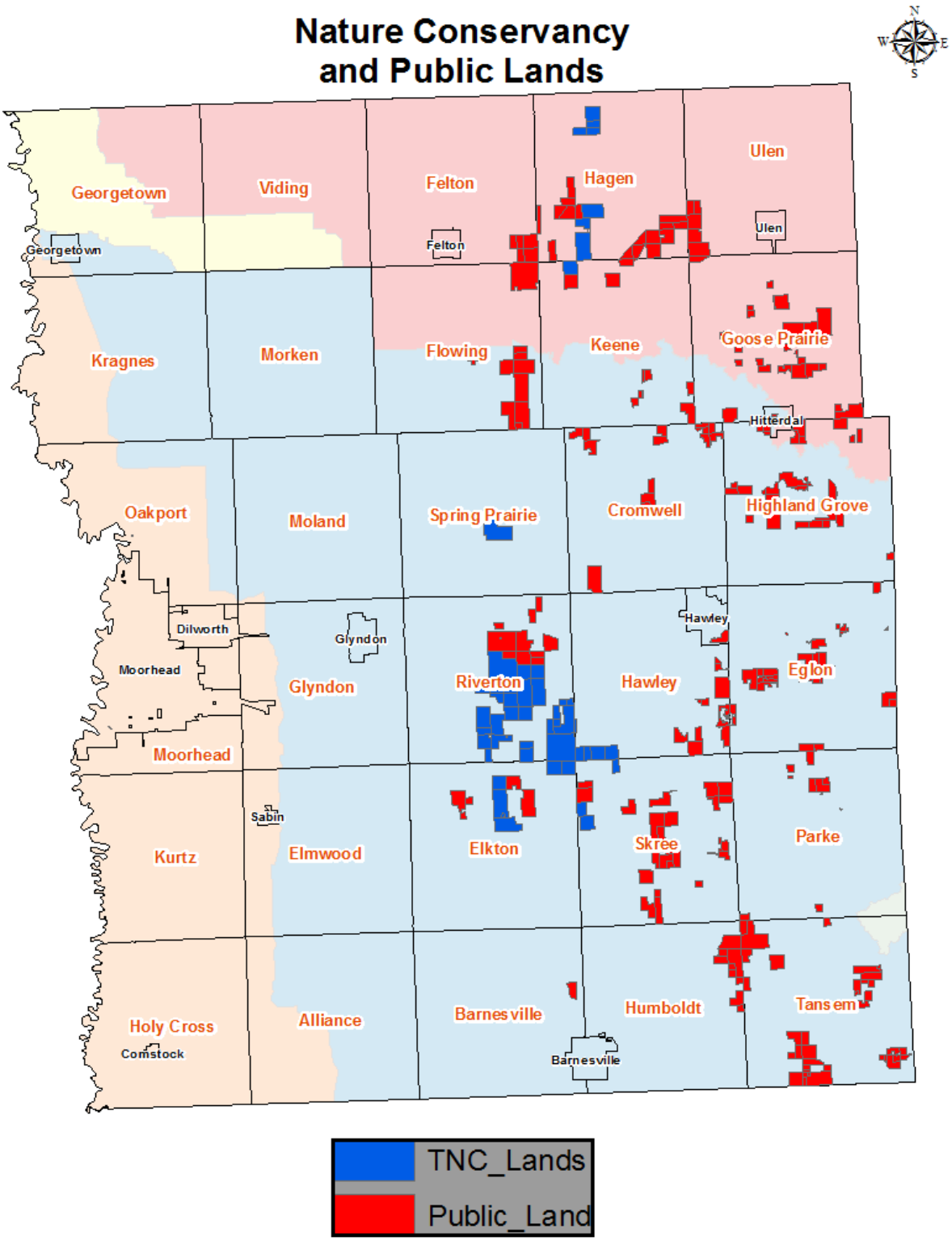

Nature Conservancy
and Public Lands
N
W
E
S
Georgetown
Viding
Felton
Hagen
Ulen
Georgetown
Felton
Ulen
Kragnes
Morken
Flowing
Keene
Goose Prairie
Hitterdal
Oakport
Moland
Spring Prairie
Cromwell
Highland Grove
Dilworth
Glyndon
Hawley
Moorhead
Glyndon
Riverton
Hawley
Eglon
Moorhead
Sabin
Kurtz
Elmwood
Elkton
Skree
Parke
Holy Cross
Comstock
Alliance
Barnesville
Humboldt
Tansem
Barnesville
TNC_Lands
Public_Land

Figure 8

Federal Emergency Management Agency (FEMA) Floodplain

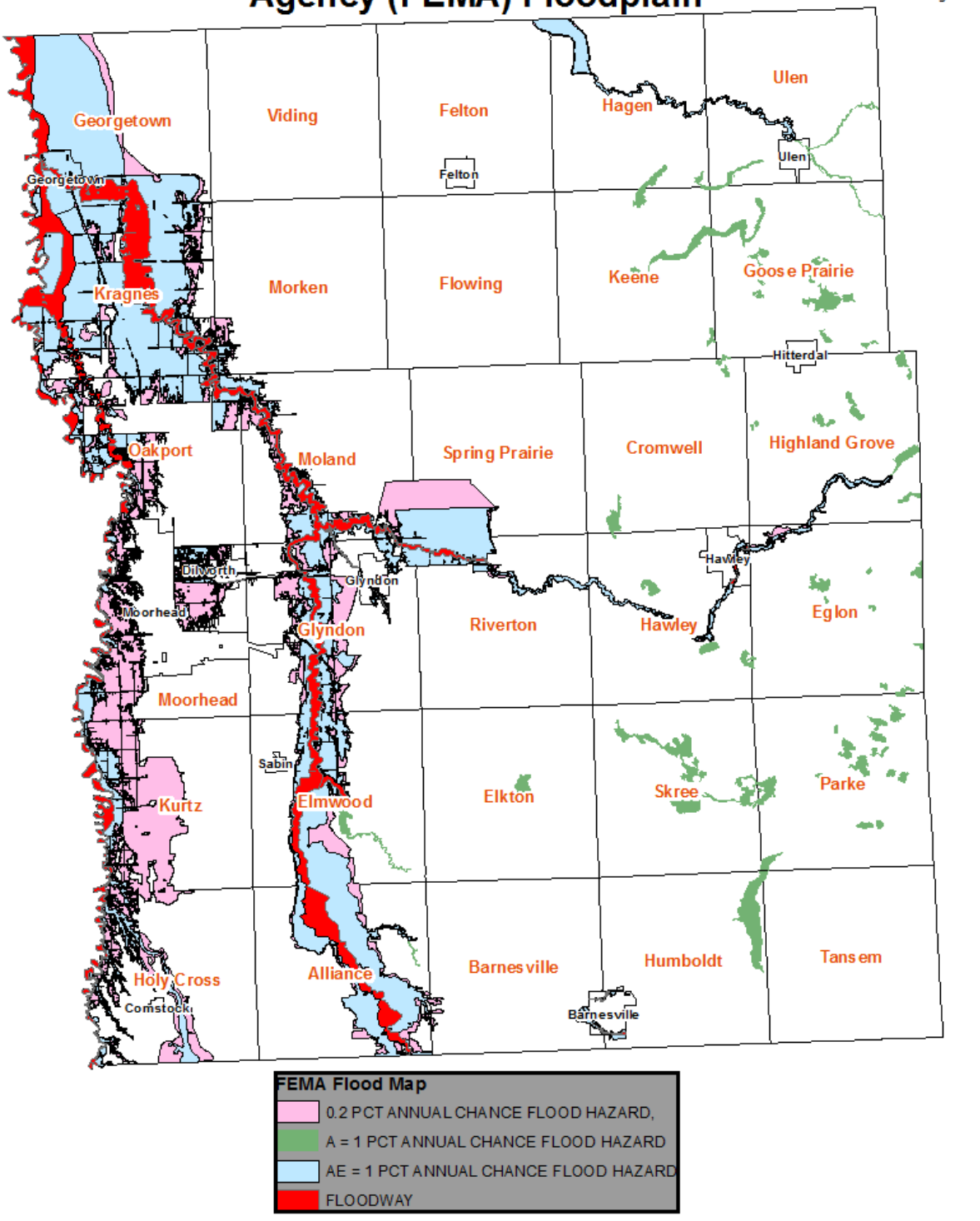


Figure 9

Highly Erodible Soils

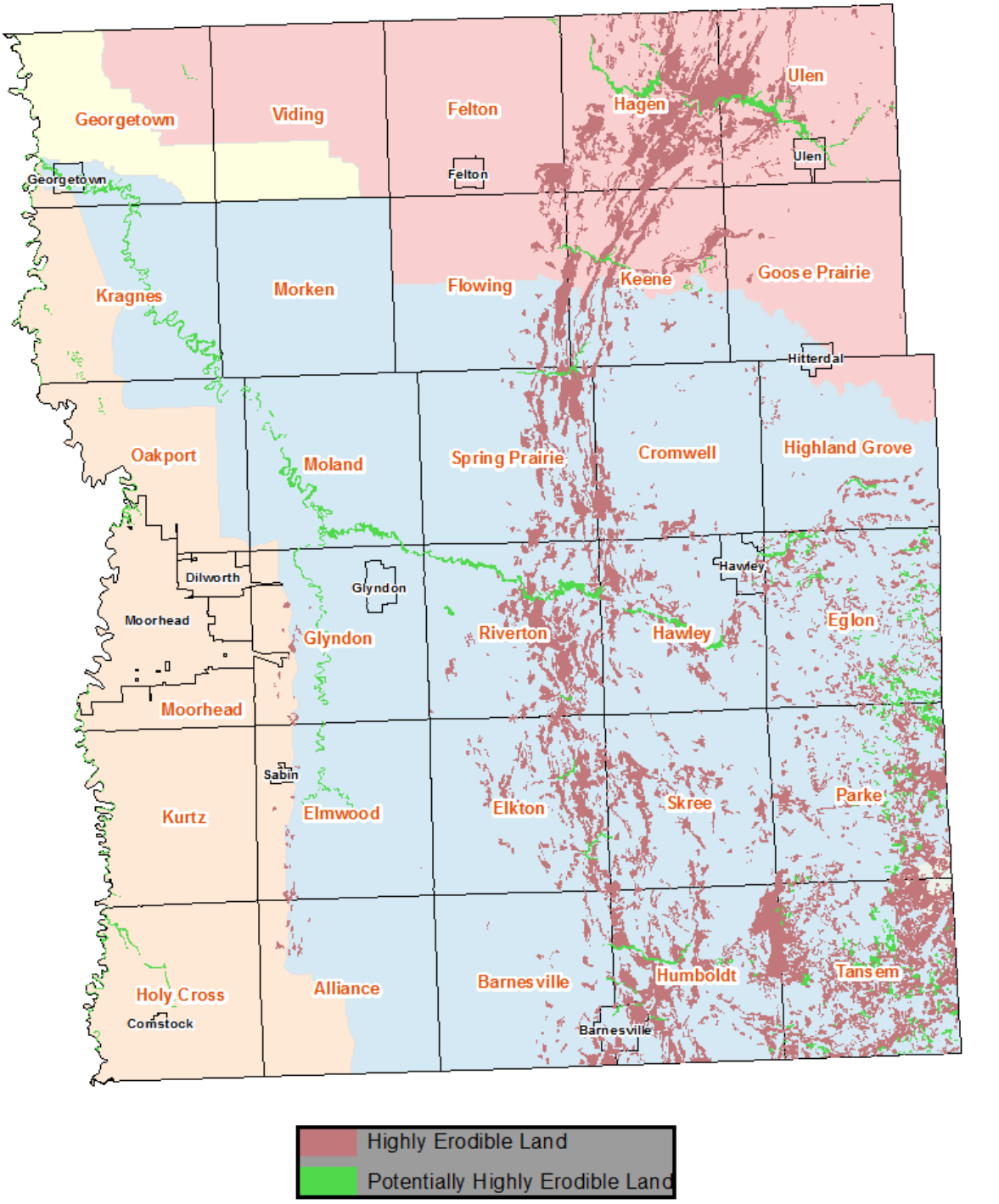


Figure 10

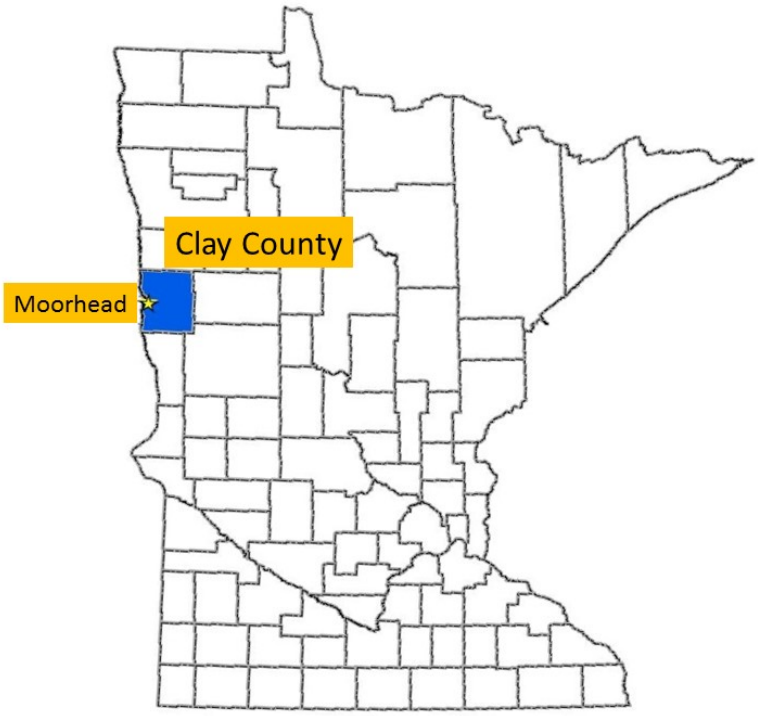
THE CLAY COUNTY

PRIORITY CONCERNS SCOPING DOCUMENT

A precursor to

THE CLAY COUNTY
LOCAL WATER MANAGEMENT PLAN

2017



Introduction

Population and Population Trends: Clay County is located in west central Minnesota along the western boundary separated from North Dakota by the Red River of the North. Moorhead, the county seat, is centrally located along the western boundary of the county. Clay County is bordered by Wilkin County to the south, Otter Tail County to the south east, Becker County to the east and Norman County to the north.

According to the 2010 census, the population of Clay County was 58,999. The Minnesota State Demographics Center estimated the population to be 62,181 in 2015. Moorhead comprises 67% of the County's total population. The cities of Dilworth, Barnesville, Hawley and Glyndon comprise another 16% of the County's total population with the remaining residing outside these incorporated areas. The Minnesota State Demographic Center projects the population will increase by 11% by 2045.

Dominant Land Use and Trends: Clay County encompasses 1, 054 square miles or 675,026 acres. It is divided nearly in half north to south with the western half comprised of the very fertile Red River of the North Basin of Northwestern Minnesota. The eastern half of the county is dominated by beach ridge deposits associated with Glacial Lake Agassiz. Cultivated land constitutes the largest portion of Clay County at 76.8%. The remaining 23.2% of the land use is comprised of urban development/open space (6.6%), grassland, hayland, or pasture (6.4%), bog, marsh, fen (wetland) (5.2%), forested land (3.0%), water (1.8%), Barren Land (0.1%) and brushland (<0.1%).

Plan Responsibility and Updates: The responsibility of administering and coordinating implementation of the Clay County Local Water Management Plan is assigned to the Clay Soil and Water Conservation District (Clay SWCD). Input, guidance and direction is provided by the Clay County Local Water Management Plan Advisory Committee. This committee is comprised of citizen, interest group, local, state and federal agency representatives.

The original Clay County Comprehensive Local Water Management Plan was locally adopted on June 12, 1990. Updates to the plan were completed in 1997 and 2005. The 2005 plan was amended in 2010.

The current plan was scheduled to expire on December 31, 2015, however the Board of Water and Soil Resources (BWSR) granted a one year extension. It is expected that the revised plan will be submitted for State approval by the December 31, 2016 deadline.

List of Priority Concerns: The following priority concerns were identified through prior public meetings, township surveys and agency input and are ranked in order of concern;

1. **Water Quality:** Including, but not limited to; impaired waters (TMDL/WRAPS), nonpoint pollution, groundwater/aquifer pollution and protection (WHP, DWSMA), septic systems.
2. **Natural Resource Enhancement & Protection:** Including, but not limited to; wetland/prairie restoration and protection, stream/river restoration, connectivity and buffers.
3. **Flood Damage Reduction:** Including, but not limited to; flooding (Fargo-Moorhead Flood Risk Management Project), effects of tiling (DWM), drainage.
4. **Erosion Concerns:** Including, but not limited to; soil erosion (wind and water), streambank erosion, sedimentation of streams, rivers, ditches, promotion of BMPs (cover crops, residue management, soil health, and field windbreaks).

Priority Concerns Identification: The Clay SWCD secured input though the Notification of Plan Update process. This included input by state agencies including the Minnesota Department of Agriculture, MN Department of Natural Resources, MN Department of Health, MN Pollution Control Agency, BWSR and the Environmental Quality Board. Federal agencies include the US Fish and Wildlife Service, Natural Resources Conservation Service, Farm Service Agency and the US Army Corps of Engineers. Local input was requested from 4 adjacent counties, 2 watershed districts, 9 cities and municipalities, 30 townships, local units of government, and public meetings. Although not required, the City of Fargo, Cass County and the Cass Soil Conservation District of North Dakota were given opportunity to provide input.

In addition, resource related concerns were gathered from existing planning efforts and documents including the Buffalo-Red River Watershed District Watershed Management Plan, the Wild Rice Watershed District Watershed Management Plan and adjacent county Local Water Management Plans.

Local, State and Federal Agency Input: The Clay SWCD solicited and received input from several local, state and federal agencies or interest group representatives. The input received helped determine the top water resource related concerns Clay County should focus on in the coming decade. The comments received are as follows:

<u>Board of Water and Soil Resources (Brett Arne, Board Conservationist, Detroit Lakes, MN)</u>

1. Erosion and sediment control
2. Flood damage reduction and natural resource enhancement
3. Stakeholder inclusion in update process
4. Stormwater pollution loading
5. Use of tools and technology to prioritize, target and measure projects

6. Collaboration and communication between SWCD and county for programs

MN Pollution Control Agency (Reed Larson, Manager, North Watershed Section, Watershed Division, St Paul, MN)

1. Water quality (Watershed Restoration and Protection Strategy (WRAPS) and Total Maximum Daily Load (TMDL) and impaired waters
2. BMP targeting
3. Restoring and buffering riverine surface waters
4. Pro-actively address failing septic systems

MN Department of Agriculture (Rob Sip, Environmental Policy Specialist, Pesticide and Fertilizer Management Division, St Cloud, MN)

1. Cover crop and residue management
2. Drainage water management (DWM)
3. Windbreaks and vegetative plantings
4. Goundwater protection

MN Department of Health (Jenilynn Marchand, Principal Planner, Environmental Health Division, Source Water Protection Unit, Bemidji, MN)

1. Unused and unsealed wells
2. Landuse as it relates to groundwater contamination
3. Promote landowner participation to protect highly vulnerable DWSMAs.

MN Department of Natural Resources (Theresa Olson, NW Regional Environmental Assessment Ecologist, Division of Ecological and Water Resources, Bemidji, MN)

1. Wetland and Prairie Protection and Restoration
2. Water conservation for State Wildlife Management Areas, Scientific and Natural Areas, wetlands and other easements
3. Use of MN DNR watershed health assessment tool in assessing vulnerabilities
4. Coordination and implementation of Fargo-Moorhead Flood Risk Management Project
5. Correct culvert replacement to maintain connectivity
6. Buffering and channel restoration of first order streams
7. Invasive species

Buffalo-Red River Watershed District (Bruce Albright, Administrator, Barnesville, MN)

1. Transition into One Watershed, One Plan (1W1P)
2. Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategy (WRAPS) for Buffalo River and Upper Red River
3. Concentrate on restoration of Wolverton Creek/Comstock Coulee
4. Erosion and sediment control

Wild Rice Watershed District (Kevin Ruud, Administrator, Ada, MN)

1. Water Quality (surface and groundwater), WRAPS development and implementation
2. Natural Resource Enhancement (NRE) and Protection (Felton Ditch and South Branch of the Wild Rice River)
3. Erosion (South Branch of the Wild Rice River)
4. Flood Damage Reduction (FDR) on Felton Ditch and South Branch of the Wild Rice River

Hagen Township (Mark Ciernia, Chairman Hagen Township)

1. Subsurface drainage
2. Ground water center pivot irrigation

River Keepers (Christine Holland, Executive Director, River Keepers, Fargo, ND)

1. Urban Best Management Practices

Citizen Input:

A Comprehensive Local Water Management Plan Advisory Committee meeting was held on December 10, 2014. A meeting to solicit public input was held on August 8, 2016. Additional opportunities for public input will be included in future Advisory Committee meetings.

These priorities will be the foundation of the Clay County Local Water Management Plan for 2017 through 2026. In the coming months, the Clay County Local Water Management Plan Advisory Committee will;

Request existing information from agencies to help assess priority concerns

Identify goals and objectives to address the priority concerns

Develop a 5 year implementation program for ongoing activities

Write a water resource management plan containing 1) Executive Summary, 2) Priority Concerns Assessment, 3) Priority Concerns Goals and Objectives, 4) Implementation Program for the Priority Concerns, 5) Implementation Program for Ongoing Activities, and 6) Appendix

As required by Minnesota Statute, a public hearing will be held to validate the focus of the final plan. The plan will then be submitted for final state review and approval. Once the plan is approved at the state level, it can be adopted by Clay County and implementation programs can be initiated.

Priority Concerns Not Addressed by this Plan; Inherently, there are issues and concerns that are unable to be adequately addressed through the Local Water Management Plan. Additionally, some issues and concerns should not be addressed through this plan, but through other entities' plans and implementation programs such as County Planning and Zoning, Watershed Districts, and others. Some of these issues include: agricultural preservation, land use conflicts, resource use conflicts, etc.