Comprehensive Local Water Management Plan
2011 – 2023



Winona County

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Winona County Comprehensive Local Water Management Plan

An amendment to the Comprehensive Local Water Management Plan developed for 2011-2018 with a 5-year implementation schedule for 2019-2023

Covering Winona County Planning and Environmental Services,
Winona County Soil and Water Conservation District, and
Stockton-Rollingstone-Minnesota City Watershed District

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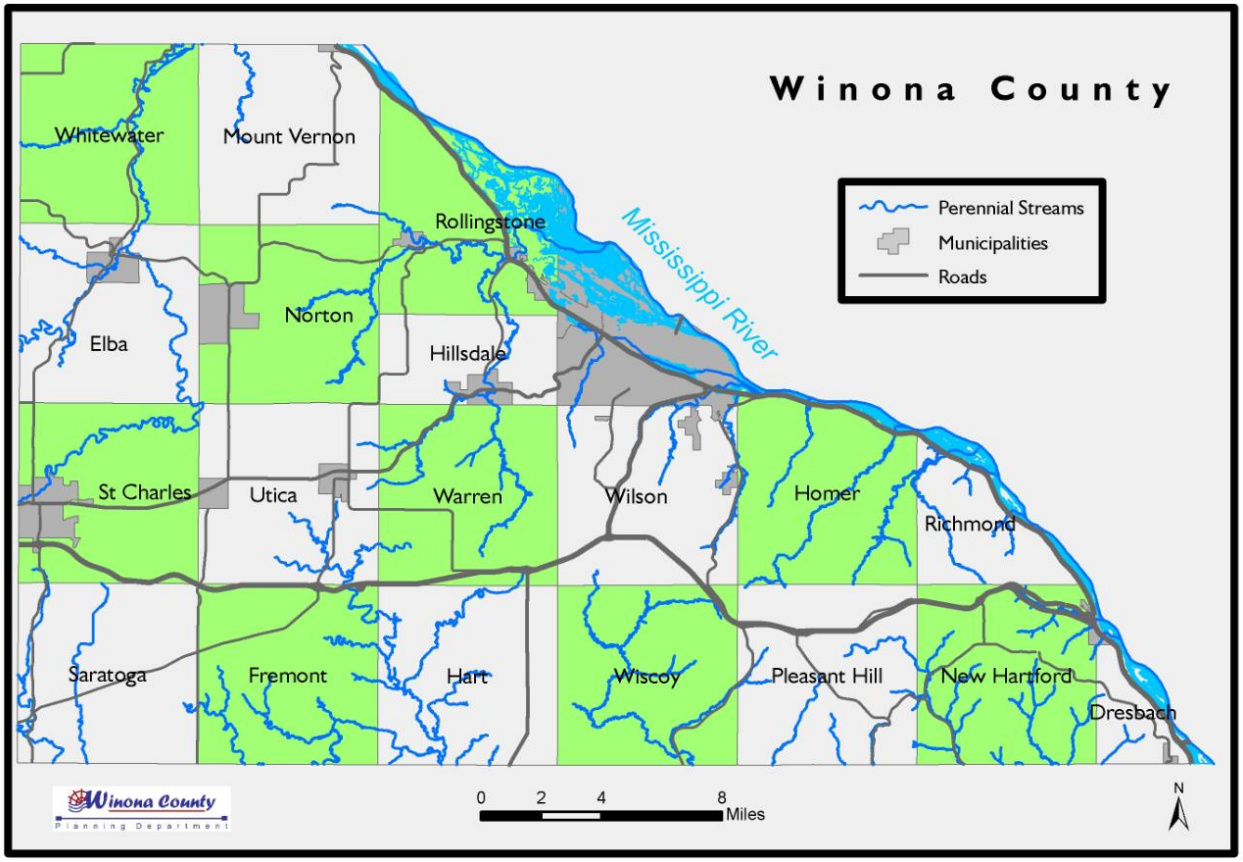
Winona County

A. Executive Summary

(Required update for 2019 Amendment to Plan)

1. Profile

Winona County is located in the Driftless region of Southeast Minnesota. Winona County is bordered on the east and north by the Mississippi River (Wisconsin border), Houston and Fillmore Counties to the south, Olmsted and Wabasha Counties to the west, and Wabasha County to the north. The total land area of Winona County is approximately 642 square miles (407,040 acres), of which 626 square miles is made up of land and 15 square miles (2.4%) is covered with water. The County includes thirteen cities and nineteen townships. The City of Winona is the county seat.



Winona County townships

Winona County is in the transitional area between hardwood forests and prairies. Western portions of the County are a part of the Rochester Plateau; eastern portions are dominated by forested bluffs. The blufflands rise 600 feet above the Mississippi River and its tributaries to relatively flat narrow ridges. The dominant land use in the County is cultivated land (43.7%) followed by deciduous forest (36.0%) and grasslands

(13.6% including hay and pasture). Cultivated lands are located throughout the county but primarily in the southwest and west central parts of the County, where agricultural fields are large and mostly row-cropped. In other areas of the County, agricultural fields tend to be smaller and include more hay and pasture. Forested lands tend to be located on steep slopes and bluffs. Forested lands are also a major cover type on public lands. The most notable public land is the Whitewater Wildlife Management Area that comprises almost 21,000 acres, most of which is located in Winona County.

Streams throughout the County arise in large part from coldwater springs and seeps. Minnesota DNR has designated 44 stream reaches as trout streams. The largest river in Winona County is the Whitewater River. The Whitewater River flows north-northeast through the northwest part of the County and empties into the Mississippi River at Weaver Bottoms in Wabasha County. The rest of the County is drained by east-flowing streams including Rollingstone Creek, Garvin Brook, Cedar Creek, Big Trout Creek and several smaller streams. The only inland lakes in Winona County are found within Winona and Goodview and were originally backwater wetlands of the Mississippi River or quarries. The water supply is drawn from bedrock aquifers. Well water use for residents includes for everything from domestic to commercial, industrial, and agriculture.

Winona County is part of the Driftless Area that defines southeastern Minnesota, northeastern Iowa, southwestern Wisconsin and northwestern Illinois. Karst topography is found throughout this Driftless Area. Karst features include caves, disappearing streams, sinkholes, and springs. These features, and underlying porous limestone bedrock, make the interconnection between surface water and groundwater very close. Groundwater can emerge from a spring, flow a short distance as a stream and flow into the ground as a disappearing stream. Sinkholes can provide a direct route for surface water to quickly reach drinking water sources without any natural filtration. Karst features make water resources more challenging to protect.

2. Purpose of the Local Water Management Plan

The intent of this Water Management Plan is to establish goals and a related set of objectives and actions for the period from 2011 – 2023 to protect, enhance, and manage water resources within Winona County in cooperation with local, regional and state partners. The 2019 amendment to the plan incorporates the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan (through Minnesota Statutes, section 103D.401). The plan focuses on a set of four priority concerns as outlined in the Priority Concerns Scoping Document. Winona County received State of Minnesota formal comments relating to the priority concerns and the development process via a March 24, 2009 letter from the Chair of Minnesota Board of Water and Soil Resources. The letter indicated the priority concerns contained in Winona County's Water Management Plan appropriate and recommended no changes to the priority concerns. This amendment does not require a new priority concerns scoping process.

History of Local Water Management

A severe drought in 1977 prompted the Minnesota Legislature to look at how the state's water supplies were being managed. At that time, the legislature saw fragmentation at the state level and disorganization at the local level. To address the need for better coordination, the Legislature passed the Comprehensive Local Water Management Act (Minnesota Statutes sections 103B.301 to 103B.355) in 1985.

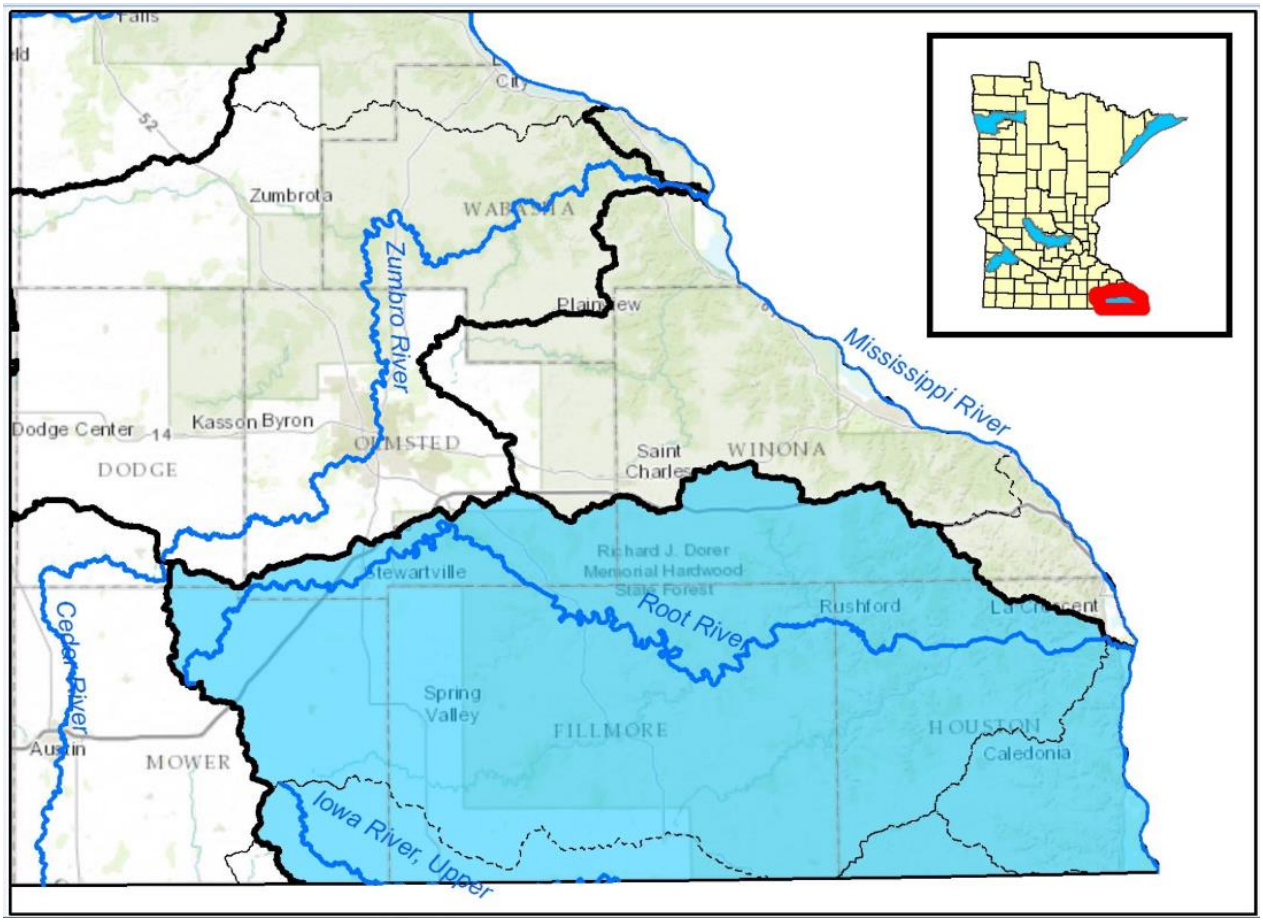
The act encourages counties to develop and implement comprehensive water management plans. While the plans are voluntary, various state grants require that a county have an adopted local water management plan that is updated periodically.

Winona County Water Planning

Since its inception, water planning in Winona County has gone through three different updates. The first water plan for Winona County was approved by Minnesota Board of Soil and Water Resources (BWSR) on March 28, 1990. The second plan was approved by BWSR on October 22, 2003. The third and most recent edition of the Winona County Comprehensive Local Water Management Plan was approved by BWSR on October 26, 2011. This plan expired on December 31, 2015, but BWSR extended this plan until 2018 to better accommodate state-wide transitions to watershed-based planning.

With the shift toward watershed-based planning, Winona County was one of six counties that began a collaborative effort to develop a watershed plan for the Root River Watershed. On December 14, 2016, BWSR approved the Root River Comprehensive Watershed Management Plan, the first approved in the State through the Comprehensive Watershed Management Planning Program (Minnesota Statutes, section 103B.801), also known as the One Watershed, One Plan (1W1P). As a partner in that watershed collaborative, Winona County and local partners, are responsible for planning and implementing priorities of the Root River Comprehensive Watershed Management Plan for the Winona County portion of the Root Watershed plan area. Priorities and implementation schedule for the Root River Watershed are included within the Root River Comprehensive Watershed Management Plan.

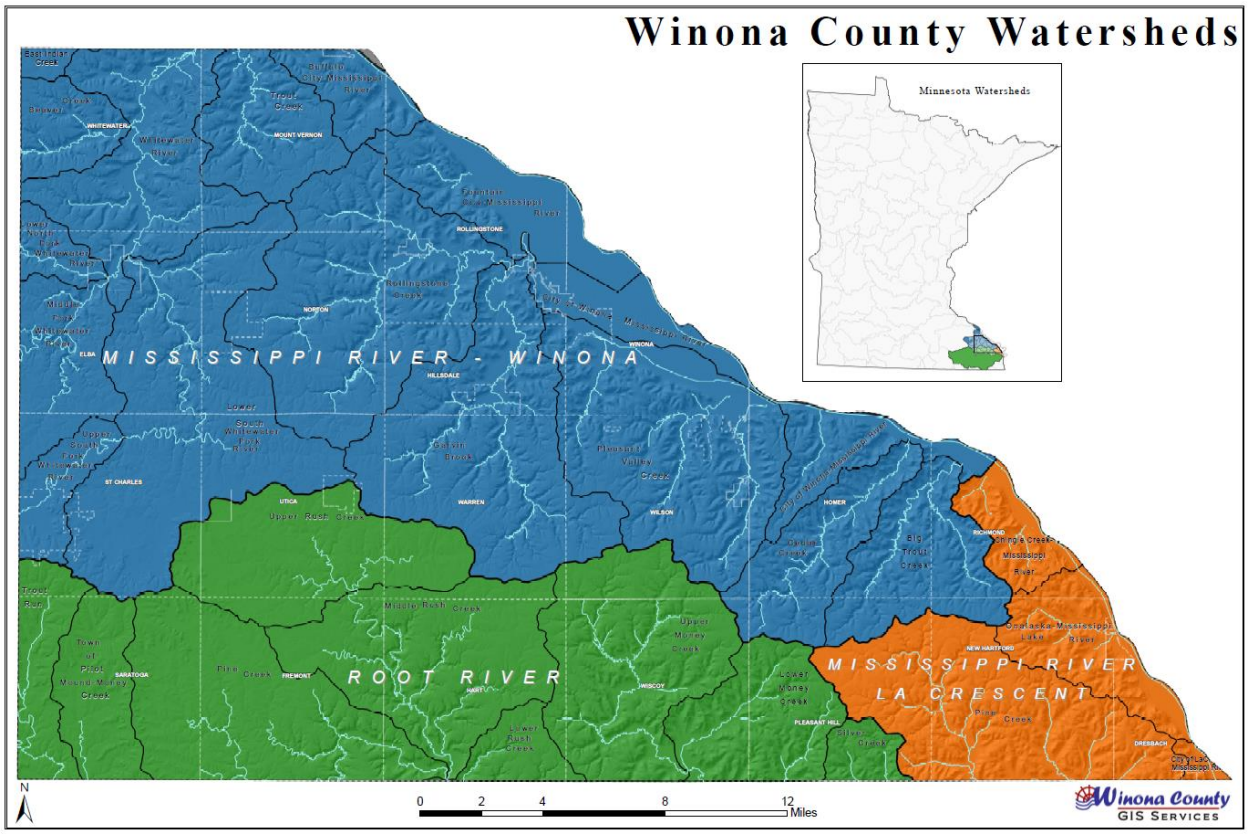
This Winona County Comprehensive Local Water Management Plan is an extension (with amendment) to the plan approved by BWSR in 2011. On July 26, 2018, BWSR approved the extension "until December 31, 2023 with the condition to complete an amendment that updates the Executive Summary and Implementation Section for the Mississippi River-Winona and Mississippi River-La Crescent watersheds prior to July 1, 2019." Although not required, in addition to a revised Executive Summary and updated Implementation Section, this plan includes additional appendices. The amended plan also incorporates the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan, which is included entirely within County boundaries.



Root River One Watershed, One Plan area. Southern Winona County includes nearly 10% of that watershed plan area.

Requirements of a local water plan are set forth in current state statute (Minnesota Statute 103B.311, Subd. 4 and 103D.401). The plan must address management of water, effective environmental protection, and efficient resource management, and must be consistent with local water management plans prepared by counties and watershed management organizations. This amendment to the local water plan updates the 5-year implementation schedule.

Responsibility for administering the water plan is assigned to the Water Plan Coordinator located in the Planning and Environmental Services Department. Guidance and review for implementing and updating the plan is provided by the Winona County Water Plan Technical Committee, consisting of representatives from various County departments, Winona County Soil and Water Conservation District, representatives of other state local and federal government and interested citizens.



***Winona County Watersheds**: The County is included in three of the State's major watersheds. The Mississippi River-Winona Watershed (blue area), covers most of Winona County. The Root River Watershed (green) covers about one-third of southern Winona County, and the Mississippi River-La Crescent (orange) is in the southeastern portion of the County. These major watersheds can be sub-divided into smaller watersheds.*

Water Planning in Minnesota

In Minnesota's history of locally led water management, watershed-based planning, also known as One Watershed, One Plan (1W1P) is the next step.

1W1P is designed to foster collaboration between upstream and downstream neighbors to work where it's most important to work in the watershed – not just limited to county boundaries. Watershed-based planning identifies prioritized resources and sets measurable goals.

Time line of 1W1P in Minnesota:

- **2011** - Local Government Water Roundtable – recommends that water planning should occur along watershed boundaries.
- **2012** - Legislation (Minnesota Statutes 103B.101, subdivision 14) authorized the Board of Water and Soil Resources (BWSR) to develop and implement a comprehensive watershed management plan approach, also known as *One Watershed, One Plan*.
- **2014** - 1W1P Pilot Program initiated; Winona County partners in Root River Watershed plan development.
- **2015** - Legislation better defines Comprehensive Watershed Management Plans (Minnesota Statutes, 103B.801) and tasked BWSR to adopt a transition plan for entire state by 2025.
- **2016** - BWSR approves Root River Comprehensive Watershed Management Plan.
- **2019 –** Six completed 1W1Ps in state; 22 watershed plans in progress.

3. Description of Priority Concerns

BWSR guidelines for this extension and amendment to the Comprehensive Local Water Management Plan do not require a Priority Concerns Scoping Document to be completed. The Scoping Document completed in 2010 in preparation for the 2011 Update is still relevant; the priority concerns remain the same:

- Water Quality
- Soil Erosion, Sediment Control and Stormwater Management
- Nutrient, Manure and Human Waste Management
- Watershed Management Approach

1. Water Quality

The water quality concern involves protecting groundwater; addressing Clean Water Act impairments and protecting surface waters; and effectively managing those land areas at the water/land interface such as riparian lands, floodplains, and sensitive groundwater recharge areas in karst settings.

Objectives

- ✓ Assess the condition of groundwater and the interconnection of land use and associated pollution risks.
- ✓ Assist public water suppliers (PWS) in implementing Actions from their Wellhead Protection Plans and/or managing their 200-foot inner wellhead management zone.
- ✓ Assist private well users in protecting and/or improving their drinking water supplies.
- ✓ Provide educational opportunities to the public and schools on drinking water issues, land use planning, groundwater quality, and the significance of karst geology.
- ✓ Promote buffers around sinkholes and protection measures in vulnerable areas.
- ✓ Address fecal coliform impairments in surface waters through implementation of TMDL activities.
- ✓ Address turbidity impairments in surface waters through implementation of TMDL activities.
- ✓ Address nitrate impairments.
- ✓ Promote and support aquatic life impairments and protection for all trout streams.
- ✓ Maintain compliance with 50-foot buffer Shoreland Ordinance and Minnesota Buffer Law requirement along public waters.

2. Soil Erosion, Sediment Control and Stormwater Management

This concern addresses steep topography and extreme soil erosion potentials. Control of erosion and sediment is a concern on agricultural lands and for residential and urban development. Effective stormwater management includes water retention and

infiltration that reduces soil erosion, improves hydrologic processes and reduces flooding.

Objectives

- ✓ Increase implementation and awareness of soil conservation practices.
- ✓ Install grass waterways, grade stabilization structures and other applicable practices that reduce erosion.
- ✓ Promote and protect forest resources.
- ✓ All municipal areas meet the principles of the EPA Phase II Stormwater Requirements.

3. Nutrient, Manure, and Human Waste Management

The concern with nutrient, manure, and human waste management is that wastes generated from feedlots and from septic systems are assumed to contribute to the Clean Water Act recreational impairments as measured by excess levels of fecal coliform in several County streams. Wastes from feedlots and septic systems as well as from commercial fertilizers can contribute to the high nitrate concentrations found in some wells and streams in the county.

Objectives

- ✓ Correct open lot runoff from noncompliant feedlots.
- ✓ Increase the usage and compliance of manure management plans among livestock producers.
- ✓ Promote pasture management.
- ✓ Address Imminent Threats to Public Health from septic systems.
- ✓ Update septic system database and GIS to show all septic systems.
- ✓ Provide operational and maintenance information to homeowners having septic systems.
- ✓ Provide financial assistance to individuals needing replacement systems.
- ✓ Provide alternative disposal options for hazardous waste and pharmaceuticals.

4. Watershed Management Approach

The Water Management Plan has the responsibility to address the water resources across the entire Winona County. The Priority Concerns described in this Plan have various impacts on County watersheds. A watershed approach provides a context for integrating programs, and emphasizing and addressing the most significant concerns in any given watershed. For example, impacts of residential development are of greater significance in the watersheds that are in and around the City of Winona. In addition, this approach provides a context for collaboration with existing organizations including watershed organizations.

Objectives

- ✓ Promote and utilize a watershed planning approach in dealing with nonpoint source pollution, soil erosion and hydrologic problems.
- ✓ Educate residents and local units of government regarding watersheds and water resources.
- ✓ Promote GIS data sharing and modeling for assessing watersheds and water resource quality.
- ✓ Implement Objectives of the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan

4. Plan Consistency With Other Local, State, and Regional Plans

The process to amend the Implementation Section of the Water Management Plan included input from the Technical Committee, including partner state and local entities. The Board of Water and Soil Resources reviewed the document and provided comments and guidance as a means to ensure consistency with state policies.

5. Recommended amendments to other plans and local controls

This 2019 Amendment to the Winona County Comprehensive Local Water Management Plan incorporates the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan. This action meets the Watershed District's water plan requirements through Minnesota Statutes 103D.401.

The Winona County Comprehensive Land Use Plan was updated in 2014 and will remain in effect for ten years. Winona County does not make any recommendations for any amendments to other plans and official controls.

B. Assessment of Priority Concerns

(This section is not an updated requirement for the 2019 Amendment.)

1. Water Quality

a. Groundwater Protection

All drinking water in Winona County comes from groundwater. The majority of citizens surveyed during the Water Management Plan update process considered drinking water as the top water resource issue.

The Safe Drinking Water Act and MN Department of Health (MDH) regulate public water supplies. Community public water supplies serve at least 25 persons or 15 service connections year-round. There are 13 community water supplies in Winona County. There are also nine non-transient, non-community water supplies. These facilities are schools and businesses having their own wells. There are 78 other public water supplies considered transient non-community. These water suppliers are gas stations, campgrounds and restaurants having their own wells.

Based on Minnesota State Demographic 2008 census data estimates, and subtracting the approximate number of households served by community water systems, there are approximately 4,200 residents relying on private wells. These residents may have their own well or in some cases may be sharing a well with a neighbor(s).

The water quality of a well depends on the well's construction and the quality of the groundwater from which that well draws. The State of Minnesota established a Well Code in 1974 that assures the proper construction of new wells and borings, and the proper sealing of unused wells and borings. In Winona County, the Environmental Services Department has the authority and implements the Minnesota Well Code for private wells throughout the County.

The MDH Drinking Water Protection Program oversees the construction and regulation of the public water supplies. Wells that were constructed prior to the Well Code have more water quality problems because of the construction methods used and because

they are more likely drawing from shallower aquifers that have been contaminated from pollutants from the land surface.

Report of Investigations #61 *Hydrogeology of the Paleozoic Bedrock of Southeastern Minnesota* (Runkel et al. 2003), describes an image of Winona County groundwater resources that is very complex. Under shallow bedrock, it is now thought, "the ground-water system may be dominated by relatively rapid movement of water through interconnected networks of secondary pores. The ability of confining units to protect underlying aquifers in such settings has not been carefully evaluated." The karst surface features and the fractured bedrock found in shallow bedrock conditions results in rapid movement of surface water and pollutants from the surface to this interconnected network. As a result, of this geology, lack of soil cover and older well construction, many public and private wells are susceptible to pollution.

The most common contaminant found in these vulnerable wells is nitrates, which is highly soluble in water. Nitrates are of concern because high concentrations in drinking water can pose a special risk for infants due to methemoglobinemia, or "blue baby syndrome". MDH has set a standard of 10-milligrams per liter for nitrate in drinking water and this is the health risk limit (HRL) for private wells. Other contaminants such as herbicides (like atrazine) may be present in these vulnerable wells but their concentrations have not been known to be above the health risk limits set by MDH, however; the testing has been limited in terms of both parameters tested and number of wells.

MDH completed source water assessments on the 100 public water supplies located in Winona County in 2003. These assessments included a determination of the source water susceptibility. This susceptibility refers to the likelihood that a contaminant will reach the source of drinking water. It reflects the results of assessing well sensitivity, aquifer sensitivity, and water quality data. The majority of the public water supplies are susceptible and in many cases had high susceptibility. Contributing factors were local geological setting, nitrate content of the well water and/or well sensitivity. The entire individual assessment is retrievable at https://www.health.state.mn.us/communities/environment/water/swp/swa.html

The water quality of private wells is also assessed. Winona County Environmental Services receives a yearly report from the Olmsted County Public Health Services laboratory with the results of samples analyzed from Winona County private wells. For nitrate-nitrogen, the percent of samples above the 10mg/l nitrate-nitrogen health risk limit ranged from 12-percent in 2007, 18-percent in 2008, 10-percent in 2009, and 8-percent in 2010.

The Southeast Minnesota Water Resources Board received funding in 2004 and is currently funded through 2012 for a grant that establishes a Volunteer Nitrate Monitoring Network (VNMN) in order to measure nitrate in private domestic wells. Data compiled by the VNMN will allow participants to assess the water quality of their wells and give

researchers a baseline of data for future studies and analysis. Eventually, data from this study and others could be used to help define areas to concentrate resources in order to better protect and improve water quality in private wells.

b. Wellhead Protection

Wellhead Protection is a way to prevent drinking water from becoming polluted by managing potential sources of contamination in the area which supplies water to a public well. Minnesota Rules Chapter 4720 specifies the requirements for developing a Wellhead Protection Plan.

Wellhead protection requirements vary depending on the type of public water supplier. Transient non-community public water supplies such as restaurants and truck stops are required to manage a 200 ft. area around their well called an inner wellhead management zone. Potential contaminant sources are inventoried and managed within the inner wellhead protection zone. In addition to these requirements community public water supplies such as municipalities and mobile home parks and non-transient non-community public water supplies such as schools and businesses have to develop a complete wellhead protection plan.

The first part of a wellhead protection plan includes a delineation of the area that will be managed and inventoried by the public water supplier and an assessment of the vulnerability of the wells based on geologic sensitivity, well construction, and water chemistry and isotopic composition. The second part of a wellhead protection plan identifies all potential contaminant sources within the area and lays out management goals, objectives, and actions to take in order to protect the drinking water supply well.

MDH provides assistance to public water suppliers for the development of implementation of wellhead protection plans and has developed a strategy for bringing them into the program. This assistance has been accelerated through grants from the Clean Water, Land & Legacy Amendment.

In Winona the cities of Winona, Goodview, and Lewiston have completed wellhead protection plans while Utica, Altura, and St. Charles are in various stages of plan development. Communities that will be brought into the program over the next several years include Bethany Water Company, Country Mobile Home Park, Elba, Green Terrace Mobile Home Estates, Hidden Valley Mobile Home Park, and Stockton.

c. Clean Water Act Impairments and Surface Water Protection

Winona County is fortunate to have many surface water resources of high recreational value. There are 44 designated trout stream reaches within the County. These streams arise from groundwater that comes to the surface as springs and seeps. Other than the branches of the Whitewater River that enter the County from the west and Trout Run in the Root River watershed, all streams originate in the county. All Winona County

streams eventually discharge to the Whitewater River, Root River, Garvin Brook, or directly into the Mississippi River.

The only lakes in the County are those in the Goodview and Winona municipalities. These lakes are popular for recreation activities including fishing, boating, and/or swimming. In addition, the Mississippi River provides for multiple uses including commercial navigation and recreation. The Upper Mississippi River National Wildlife and Fish Refuge is an extensive labyrinth of islands and backwater wetlands that abut much of the County.

There are several ways to evaluate the water quality and overall integrity of Winona County surface water resources depending on the perspective and uses of the resource. For a trout angler, a sustainable trout fishery or catching a trophy brown trout is an indication of a high quality resource. For an ecologist, a water body that supports a healthy community of native organisms may be considered a high quality resource. Sampling the water chemistry of the water resource and comparing it to given standards is another way that water quality can be assessed.

Under the Clean Water Act the Minnesota Pollution Control Agency (MPCA) is responsible for assessing the quality or integrity of the States lakes, streams, and rivers. Water bodies that do not meet required standards, the MPCA places on a list. It is then required that total maximum daily load (TMDL) studies be conducted in order to determine what levels of pollutants are acceptable in order to maintain water quality for a given use which can then be used in setting pollution reduction goals.

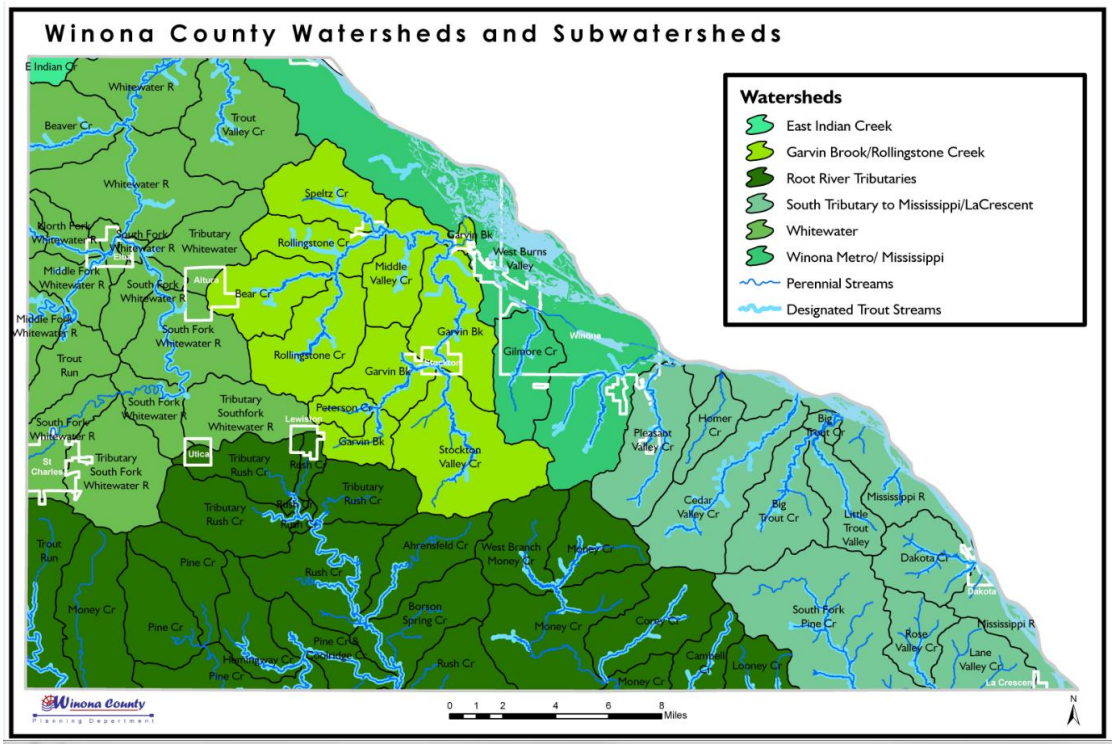
Several surface waters have been monitored and in turn formally assessed to determine whether they support their beneficial uses which include recreation and aquatic life and in some cases drinking water. A list of all monitoring stations and their assessments is available from the MPCA Environmental Data Access tool (https://www.pca.state.mn.us/environmental-data). The list of Winona County water bodies that are impaired are in the Appendix (pages 62-65).

A formally assessed waterbody shown not to support one or more of its use(s) is considered *impaired*. The Minnesota Pollution Control Agency (MPCA) conducts these assessments every two years with the United States Environmental Protection Agency certifying the results. The 2018 impaired waters list for Winona County can be found in the Appendix. This list is often referred to as the Clean Water Act 303(d) List. It is notable that there are two reaches in the Whitewater River watershed listed on the draft 2018 Impaired Waters List. The impairment is for drinking water due to the presence of excessive levels of nitrates.

d. Recreation Impairments and Fecal Coliform TMDL

Fecal coliform is a bacteria that can be measured in water and is indicative of the existence of pathogens. Several sampled streams in southeast Minnesota including a few found in Winona County exceed the fecal coliform standard and are listed as impaired. These watercourses consist of the North Fork Whitewater River, Middle Fork

Whitewater River, South Fork Whitewater River, Garvin Brook and Stockton Valley Creek in the Garvin Brook watershed, and the lower Money Creek in the Root River watershed. The presence of pathogens in these watercourses severely reduces their value as recreational resources for County residents.



A 2006 Report produced by the MPCA and subsequently approved by the US EPA, summarizes the fecal coliform impairments in southeast Minnesota streams. The Report titled *Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota* determined the TMDL allocation for each stream reach. A list of the TMDLs for stream reaches in Winona County can be found in the Appendix (page 66).

The Impaired Waters List for fecal coliform in 2008 included three additional reaches of Winona County streams. These are Peterson Creek and Garvin Brook (T107 R8W S2, south line to Mississippi River (Burleigh Slough)), and the lower end of Rollingstone Creek in the Garvin Brook Watershed. These impairments will be addressed by the MPCA through the Intensive Watershed Monitoring/Watershed Approach that began in the Mississippi River-Winona Watershed in 2010.

e. Aquatic Life Use impairment and Turbidity TMDL Development

One of the major beneficial uses of surface waters is aquatic life and this use is in line with the “fishable” goal of the Clean Water Act. Under the Water Quality Rules Minnesota Chapter 7050, there are several water chemistry/quality standards for

aquatic life including turbidity. Turbidity is a measure of the relative clarity of water such that the greater the clarity the less turbid. A turbidity meter measures the turbidity of water and reports the reading as nephelometric turbidity units (NTUs). For several different reasons, excessively turbid waters have the ability to diminish the aquatic life in a stream.

MPCA researchers have determined a relationship between the turbidity standard, and the observed clarity using transparency tubes. For this reason, the transparency tube readings compiled by citizen volunteers is a convenient means to assess streams for turbidity. The results of turbidity assessments in Winona County have resulted in several streams being listed as impaired for turbidity.

There is a Turbidity TMDL Project underway for Whitewater River Watershed and a project will be starting to address the turbidity impairments in Garvin Brook. The Fillmore County SWCD is overseeing a Root River Turbidity TMDL Project that includes a reach of Money Creek in Winona County. These projects are trying to determine the sources of the turbidity.

f. Drinking Water Impairment and Nitrate TMDL Development

Minnesota Rules Chapter 7050.0410 protects designated trout streams as sources of drinking water. The 2010 Assessments of beneficial uses incorporated the drinking water use for the first time. Based on a comparison to the Safe Drinking Water Act maximum concentration limit (MCL) of 10 mg/l NO3-N, two reaches of the Whitewater River Watershed, the Middle Fork Whitewater, and the South Fork, exceed the nitrate standard such that the drinking water use is considered impaired. A TMDL will be developed for these reaches along with other streams in southeast Minnesota that exceed the drinking water standard for nitrates.

g. Surface Water Protection

Several other Winona County streams and lakes have not undergone this formal assessment process. Furthermore, there are other factors affecting aquatic life in surface waters besides turbidity. Some of these may relate to water chemistry while others relate to habitat, invasive species, the watershed's landscape, and the hydrology and geomorphology of the streams.

Recognizing the need for a more integrative approach to assessing surface waters for aquatic life, MPCA has initiated a ten-year rotational watershed approach to monitoring, assessment, and development of TMDLs or protection strategies (for waters not deemed impaired).

During the summer of 2010, MPCA crews will sample watercourses in Winona County including the Whitewater River and the Garvin Brook Watersheds, and the watersheds of the southern tributaries such as Burns Valley, Pleasant Valley, Cedar Valley, Big Trout, and Miller Valley Creeks, as well as Lake Winona. An intensive watershed

monitoring effort occurred in the Root River Watershed in 2008 and included Trout Run as well as streams in the Rush-Pine and Money Creek Watersheds.

These monitoring efforts having a significant biological monitoring component, will provide an increased number of assessments on the beneficial use for aquatic life. Biological assessments will provide an integrative picture of the condition of aquatic life in the surface waters of the County. These assessments will indicate which stressors or potential stressors will need attention in order to restore or protect aquatic life.

h. Management of Sensitive Areas of Water/Land Interface

There are many places in Winona County where the land and water meet. These areas tend to be very sensitive. Included in these areas are riparian zones next to streams, lakes, and wetlands, and karst features such as sinkholes. These are the points where surface water runoff enters a waterbody or groundwater system. There is ample research to indicate that buffering these interface areas by utilizing permanent vegetation will reduce sediment and related pollutants from entering the water system.

Enhancing these buffers through planting and maintaining native vegetation, and expanding these buffers across the entire floodplain has the potential of increasing the benefits these areas provide. The added benefits include wildlife habitat and corridors, flood storage, groundwater recharge, and carbon sequestration.

The Winona County Zoning Ordinance requires a 50-foot, permanent vegetative buffer adjacent to protected waters in agricultural areas unless the landowner has an approved Resource Management System. An Environment and Natural Resources Trust Fund (ENRTF) project led by the Whitewater Watershed Project emphasized the importance of these buffers in southeast Minnesota. As part of the project, the Cannon River Watershed Partnership (CRWP) used aerial photo interpretation to map the land uses within 300 feet of protected public waters in the ten-county, study area. The goal of this mapping exercise was to determine the location and the extent of cultivation in the Shoreland Overlay District, and within the 50-foot buffer. The results are available on CRWP's website.

For Winona County, the analysis indicates of the 5,512-acres found within the Shoreland buffer, cultivation occurs on 160-acres or approximately 2.9 percent. Other counties in the study, cultivation in the Shoreland buffer ranged between two and ten-percent.

The ENRTF Study also surveyed landowners regarding their understanding of the need for stream buffers and their knowledge regarding the Zoning Ordinance requirement for

a 50-foot vegetative buffer. In Winona County, of the 85 returned surveys, 65-percent of the participants knew that their property was adjacent to protected or public waters. Only 39-percent were aware of the 50-foot buffer requirement with 36-percent pasturing livestock along the watercourse, and 35-percent using a stream for livestock watering.

Maintenance, cost, and time were considered the greatest barriers to maintaining buffers along streams. The Study offers as the best approaches for dealing with those landowners that do not have the 50-foot buffer:

1. Providing help in finding financial assistance,
2. Education about buffer requirements, and
3. Reduction in property tax for land in the buffer.

Because sinkholes are an entry point for surface water and related pollutants to enter the groundwater system, there are setback requirements (or recommendations) for field application of agricultural products and manure. Various University of Minnesota Department of Geology and Geophysics efforts inventoried sinkholes in Winona County (Dalgleish, 1985, Magdalene, 1995, and Gao, 2002). Presently there are 663 inventoried sinkholes in Winona County and over half of them have been filled. The University of Minnesota is utilizing light detection and ranging (LiDAR) technology to insure mapping accuracy. Utilizing LiDAR digital elevation models (DEMs) researchers have observed several hundred new sinkholes in Winona County. These new features will need to be field verified.

2. Soil Erosion, Sediment Control and Stormwater Management

Soil erosion is the removal of material from the soil surface with water and wind being the most common causes. In southeast Minnesota, the potential of soil erosion from water has been determined to be extreme. From the Average Annual Soil Erosion by Water on Cropland and CRP based on the National Resource Inventory 1997, the average annual erosion rates were three to six-tons/acre/year in southeast Minnesota. The Inventory did not include gully erosion.

The 2007 August Flood caused significant movement of soil and bedrock material from gullies, streambeds, and stream banks in many of Winona County's watersheds. Stream channels widened, widespread deposition of sediment and rock occurred on floodplains, and excessive erosion denuded ravines. Water resource professionals described much of the County's fluvial landscape after the Flood as in a state of instability and are working back to equilibrium.

Conservation practices, such as grass waterways and grade stabilizations, trap sediment from the field and prevent the formation of gullies. A review of aerial photographs by a Minnesota Conservation Corps crew estimated there are 1,620 grade stabilization structures in Winona County. The 2007 August Flood caused or exacerbated the degradation of many of these structures. The Winona County SWCD has been investigating the post Flood integrity of these structures and determined that

153 of them are in need of some form of repair. There has been no comprehensive assessment of gully erosion in any watershed in Winona County.

The process of sediment movement and delivery to water resources are complex hydrologic and geomorphologic processes. The only intensive effort to understand the watershed process of soil erosion and sediment delivery in Winona County was the sediment budget devised for the Whitewater River watershed by the Natural Resources Conservation Service (NRCS) in 1993. As noted from the Soil and Water Conservation Society's 2004 Annual Conference abstract regarding this study:

> *Erosion estimates were developed for sheet and rill erosion using the AgNPS methodology. Streambank erosion estimates were developed from field surveys and stream channel considerations. Gully erosion estimates were compiled from field staff reports. Historical cross-sections of the river valley's, initially conducted by Stafford Happ of the ARS in the 1930s and then again in the 1960s, were resurveyed by NRCS staff in 1993. These sedimentation ranges provide a context for flood plain deposition and channel changes over a period of 60 years. Results of the sediment budgeting process show that overall soil erosion amounts to about 666,000 tons annually. In relative order of contribution are: sheet and rill erosion (68%), streambank erosion (21%), classic gully erosion (8%), and ephemeral gully erosion (3%), About 11% of the total gross erosion is yielded at the watershed outlet at Weaver Bottoms on the Mississippi River.*

A part of the Turbidity TMDL Project in the Whitewater River Watershed has the responsibility of updating the sediment budget. Furthermore, Ecological Services of the Department of Natural Resources is utilizing a technical procedure to evaluate the sediment concerns and bank erosion hazards in the Whitewater River Watershed. The Watershed Assessment of River Stability and Sediment Supply (WARSS) evaluates streams and rivers impaired by excess sediment.

Soil erosion and sediment control are of concern because loss of soil in agricultural areas results in an overall loss of productivity on crop and pasture lands. Additionally, accelerated sedimentation in streams can change the configuration of stream channels, change patterns of aquatic plant growth, alter habitats including fish spawning areas, and impact macro invertebrate communities.

Precipitation affects soil erosion and the movement of sediment. Rain and snow is absorbed into the ground but once saturated, overland flow will occur. Vegetative cover can impede the movement of this water. Impervious surfaces, on the other hand, such as streets and roofs, do not provide for any infiltration. Stormwater management is the practice of treating water runoff.

Permits at the state, county, and city levels monitor certain construction activities to reduce the likelihood of soil erosion, sedimentation, and altered stormwater flow. Furthermore, municipalities over a certain size are also regulated by the MPCA under a permit and a program called MS4 (municipal separate storm sewer system). The only MS4 in Winona County is the City of Winona. MS4 communities are required to develop and implement a Stormwater Pollution Prevention Program (SWPPP) to reduce the discharge of pollutants from their storm sewer system to the maximum extent practicable. The SWPPP must cover six minimum control measures, and the MS4 must identify best management practices (BMPs) and measurable goals associated with each minimum control measure.

Due to its landscape and a history of severe erosion, Winona County officials need to be aware of the required review and permitting process for property improvements. These officials should also promote alternative designs for treating stormwater such as bioinfiltration (shallow, landscaped depressions used to promote absorption and infiltration of stormwater runoff) as measures to reduce stormwater runoff from construction sites.

3. Nutrient, Manure and Human Waste Management

a. Manure Waste Management

Livestock production characterizes the agriculture in Winona County. According to the 2007 Census of Agriculture, Winona County is fourth in Minnesota for cattle and calves inventory and 87th in the nation. The inventory of cattle and calves was 84,671 with estimates of 37,395 hogs and pigs, and 17,377 layers (chickens) https://www.nass.usda.gov/Statistics_by_State/Minnesota/Publications/Livestock_Press_Releases/index.php.

Dairy is the leading agricultural enterprise in the County since the steep terrain associated with the Blufflands accommodates dairy operations. These operations rely on hay fields and pastures, and this perennial vegetation reduces erosion and requires less nutrient inputs than row crops. Manure is a valuable resource that improves soil quality and can reduce or even eliminate the need for synthetic fertilizers but care is necessary to avoid over application, and to keep it from adversely affecting ground and surface waters. Potential water pollution concerns from manure include pathogens, nutrients primarily nitrogen and phosphorus and biochemical oxygen demanding (BOD) organic manner.

There are several potential places where manure can affect water resources. The feedlot itself is a potential site as well as manure storage areas, sites of manure application, and pasturing animals adjacent to surface waters.

There are 894 registered feedlots in Winona County of which 591 require registration. The table below shows the breakdown by type. Since October 2000, livestock producers having open feedlots with fewer than 300-animal units have had the option to sign an Open Lot Agreement whereby they commit to correct their open lot runoff problems in exchange for a flexible time schedule for compliance and a conditional waiver from enforcement of penalties for past violations of water quality standards. Producers need to complete interim measures by October 1, 2005, and final corrective measures by October 1, 2010. In Winona County, there were approximately 740 sites eligible for the Open Lot Agreement. Of those, 463 signed the Agreement. Estimates show there are about 225 sites in the County still having open lot runoff concerns.

From the 2009 Feedlot Officer's Report regarding registered feedlots in Winona County

Feedlot Amount	Number
Number of feedlots registered in Shoreland with 10-299 AU	70
Number of feedlots registered outside Shoreland with 50-299 AU	454
Number of NON-NPDES sites greater than/equal to 300 AU	60
Number of feedlots registered with NPDES permits	7
Total	591
Number of sites with 10 AU or more in Shoreland	73
Number of sites with 10 AU or more that are both in shoreland and in a Drinking Water Supplu Management Area (DWSMA)	1

Manure storage provides landowners with many benefits including flexibility of application, better utilization of nutrients, and better control or even elimination of runoff. There is also a degree of potential risk associated with a manure storage structure including collapse, leaks, and poor management. More stringent design requirements introduced in the middle 1990's have reduced these risks.

Since the mid 1990's, manure storage areas have been required to have at least five feet of soil between the pit floor and bedrock. Having this separation allows the soil to treat small amounts of leakage that may escape the storage area before having a

chance to enter groundwater. Furthermore, the construction of manure storage areas go beyond being earthen lined, they are now required to have an additional plastic liner or be made of watertight concrete. Several manure storage areas have been abandoned or reconstructed over the years.

One of the biggest risks associated with the storage of manure is proper management. Human error or the effects of improper maintenance and management can lead to contamination of water sources by undermining the design of the manure storage structure and causing it not to perform properly. Agitating and pumping in areas not designed for that activity may result in compromising the liners of the storage structure and decreasing soil separation distances to bedrock. Damaged liners and diminished separation distances increase the potential of manure impacting ground water.

Over application of manure and nutrients, inappropriate timing of application, and/or inappropriate application in relation to sensitive areas can contribute to ground and surface water contamination. For this reason and because it has been implicated in fecal coliform impairments, the *Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota Report* (June 2006) discusses the adoption of Manure Management Plans:

> *Feedlot rules require that manure management plans be developed for any feedlots that need a permit. These include the following categories of feedlots: Those with more than 300 animal units that are planning new construction or expansion; There is a pollution hazard that has not been corrected through the Open Lot Agreement; Feedlot has been designated as a CAFO (more than 1000 animal units or direct man-made conveyance to waters) Feedlot has more than 300 animal units and is applying manure in sensitive areas, including: a) soil P levels exceeding 120/150 ppm Olsen/Bray, or half those values within 300 feet of public waters; b) vulnerable drinking water supply management areas; or c) slopes exceeding 6 percent within 300 feet of waters. The development of manure management plans for these feedlots should result in at least half the volume of manure in the basin being subject to manure management planning by 2005. This percentage will continue to increase thereafter. Practices that reduce fecal coliform runoff will be promoted for manure management plans within the project area, and may be required for CAFOs. The MPCA conducts annual inspections of NPDES permittees. This will include inspections of manure application records and manure management plans. For feedlots with 300 to 999 animal units, with interim permits or construction permits, counties are responsible for inspections of manure application records and manure management plans. Funding to support technical assistance and to provide producer incentives will be sought to maximize producer adoption of manure management plans.*

There are approximately sixty-seven feedlots with over 300-animal units required to have a Manure Management Plan. All of these sites have had a Plan. Although MPCA

Rules do not require Manure Management Plans for sites under 300-animal units, the Rules do require that farmers not over apply their nutrients. There are 340 facilities in Winona County having between 75 and 300-animal units, and in order to prevent the over application of manure, many of these operators have created Manure Management Plans. Ideally, any site that produces a quantity of manure should have a Manure Management Plan as well.

Pasturing animals adjacent to watercourses can cause adverse impacts if not properly managed. Livestock have the potential to damage the integrity of streambanks and accelerate their erosion leading to sedimentation and nutrient loading of rivers and streams. For pastures, overgrazing can compact soil and prevent the growth of vegetation resulting in runoff, and a lack of infiltration. Non-eroded riparian areas containing suitable amounts of grass and legumes are viable for grazing through proper pasture management.

Studies have shown that grazing has actually helped stabilize some streambanks because of the compaction that occurs because of livestock. If pasturing of animals on streambanks or land adjacent to other surface waters is a problem, a number of Best Management Practices (BMPs) are available to alleviate the problem. Some BMPs include stream fencing to exclude livestock from riparian areas and pasture fencing to maximize efficiency of rotational grazing by frequently moving livestock to allow pasture to regenerate. Other BMP's include stabilized stream crossings and alternative water sources such as constructed ponds to allow livestock to drink without harming streambanks or surface waters. It is also important to keep winter feeding areas away from surface waters to prevent accumulated manure from running off during spring thaw.

b. Human Waste Management

There are approximately 4,300 year-round households, 105 seasonal dwellings and 330 other establishments that employ onsite septic systems for a total of 4,735 septic systems in Winona County. Of these 1,515 are assumed to be noncompliant and 568 are assumed to be Imminent Public Health Threats as noted by the SSTS 2009 Report. Municipal sewer systems having an NPDES permit and subject to MPCA regulations service the other approximately 15,000 households in Winona County.

Septic systems are scattered throughout the County as well as clustered in small communities and unincorporated hamlets. In 2006, MPCA requested Counties to provide a list of small communities that have needs regarding sewage treatment. The small communities on the list sent to the MPCA can be found on a map located in the Appendix (page 87). MPCA defined a small community with wastewater needs as one where there is a cluster of five or more homes and businesses, on lots typically less than one-acre in size, that have suspected or known to be in need of effective wastewater treatment. The MPCA indicated that these areas could include incorporated cities, areas within incorporated cities, unincorporated villages, manufactured home parks, subdivisions, lakeshore developments, or other clusters of homes and

businesses. The need could be because there were no septic systems, there were straight pipes or other surfacing systems, old systems, poor soils, and/or small lots.

County staff developed the small communities list by going through a process to first identify all small communities using the Winona County GIS services. The small communities that are known to have adequate onsite sewage treatment were excluded from the needs list. The remaining small communities are ones known or suspected to have some sewage treatment problems. However, the extent of these problems within most of these small communities is still a question.

After the 2007 Flood, there have been several projects that will enable households to connect to centralized sewers through annexation with the City of Goodview. These include sewer projects in the Seahler/Anderson and Gunderson Subdivisions. Furthermore, the City of Minnesota City has received a grant from the Public Facilities Authority, and has developed a Facilities Plan for a publicly owned wastewater treatment plant.

The Southeast Minnesota Wastewater Initiative and County staff are working with the City of Dakota and Dresbach Township to identify possible solutions for their wastewater problems. With a number of very small lots and little land for replacement systems, the most favored solution is a centralized sewer system.

The impetus for the statewide attention and the regional effort on small communities has been in part to address the fecal coliform TMDLs. Additionally, there is growing recognition that maintaining individual septic systems in these small communities is a challenge because homeowners may not have room to replace a septic system that is found to be failing.

Failing septic systems pose risks to humans and animals because of direct exposure or through water (ground or surface water) exposure to human pathogens. Other environmental concerns with incomplete treatment are excess nutrients entering ground and surface water. Another critical concern is other waste products introduced to septic systems such as cleaning products, pharmaceuticals, and other untreated chemicals.

Winona County has worked with both the Winona County SWCD and the Whitewater River Watershed Project in trying to secure loan funds for citizens that need to upgrade their system. Through a 319 Grant to address fecal coliform impairments in the South Branch Whitewater Watershed, a low interest loan program exists to provide citizens with a financial means to upgrade septic systems. With this program, the County is the lender and the landowner repays the loan through a special assessment on their taxes.

Winona County SWCD administers the Agriculture Best Management Program (AgBMP) from the Minnesota Department of Agriculture and works with County staff to

identify citizens in need. These citizens have worked with banks that are participating in the MDA AgBMP loan program.

Finally, the proposed Zoning Ordinance contains a requirement of a compliance inspection at the point of sale or property transfer. This provision will be an effective step in updating noncompliant septic systems over the long-term.

4. Watershed Management Approach

A watershed is the land area draining into a river or lake at a given point. There are several reasons why it makes sense to assess and manage water resources in the context of watersheds. Watershed assessments allow citizens and units of government to grapple with the mechanisms and processes occurring within a watershed including the hydrology, connectivity, biology, geomorphology and water quality that define each watershed and make them similar or different. See https://www.dnr.state.mn.us/whaf/index.html for more detail regarding these five components.

A watershed approach allows for a geographical evaluation of the quality of water resources as well as providing for a place-based connection for citizens by linking people through a common resource that in turn promotes a sense of responsibility. Watershed assessments can indicate where investments in conservation projects could alleviate downstream problems. Importantly, it is a requirement of the Minnesota Statutes governing water planning to address problems through the context of watershed units.

There are a number of ways that watersheds can be nested for descriptive or management purposes. On a national scale, Winona County has parts of three watersheds with eight - digit hydrologic unit codes (HUC). These include:

- Mississippi River-Winona HUC 07040003, a watershed that includes the Buffalo River Watershed in Wisconsin as well as the Whitewater River, Garvin Brook, and the tributaries of the Mississippi River such as Gilmore Creek, Burns Valley Creek, Pleasant Valley Creek, Cedar Valley Creek, Big Trout Creek, Miller Valley Creek and Dakota Creek.
- Root River HUC 07040008 includes Trout Run, Rush, Pine and Money Creek Watersheds in Winona County as well as many streams in Fillmore and Houston Counties.
- Mississippi River-La Crescent watershed HUC 07040006 includes just a small portion of Winona County encompassing Pine Creek (New Hartford Township), Rose Valley Creek, and Burns Valley Creek.

These Watershed units represent the scale that MPCA uses for their ten-year intensive watershed monitoring schedule as well as the units used by the Minnesota DNR for their watershed assessment tool (https://www.dnr.state.mn.us/whaf/index.html). Nested

within these watersheds are smaller watersheds that DNR refers to as minor watersheds (https://www.dnr.state.mn.us/watersheds/history_standards.html for a history of watershed delineation in Minnesota). There are 68 minor watersheds in Winona County ranging in size from 300 to 37,000-acres. These minor watersheds mostly correspond to the watersheds of known individual streams, many of which are designated trout streams.

In Winona County, there are two existing organizations having the mission to confront water resources through a watershed approach. The Stockton-Rollingstone-Minnesota City (SRMC) Watershed District lies in the Buffalo-Whitewater Watershed and is part of the Lower Mississippi River Basin. The District corresponds to the geographical extent of the Garvin Brook Watershed and lies entirely within Winona County. A Watershed District is a special government entity responsible for monitoring and regulating various aspects of water management as authorized by state legislation. The Stockton-Rollingstone-Minnesota City Watershed District has the responsibility to address flooding, and other concerns in the watersheds of Garvin Brook, Rollingstone Creek, and their tributaries. The Whitewater River Watershed Project works to provide education, technical and financial assistance for conservation projects within the Watershed. The watershed project is directed by a Joint Powers Board comprised of representatives of County Commissioners and Soil and Water Conservation Districts from Winona, Wabasha, and Olmsted Counties. The Whitewater Watershed is located adjacent to the Garvin Brook Watershed and is similarly located within the Buffalo-Whitewater Watershed and Lower Mississippi River Basin.

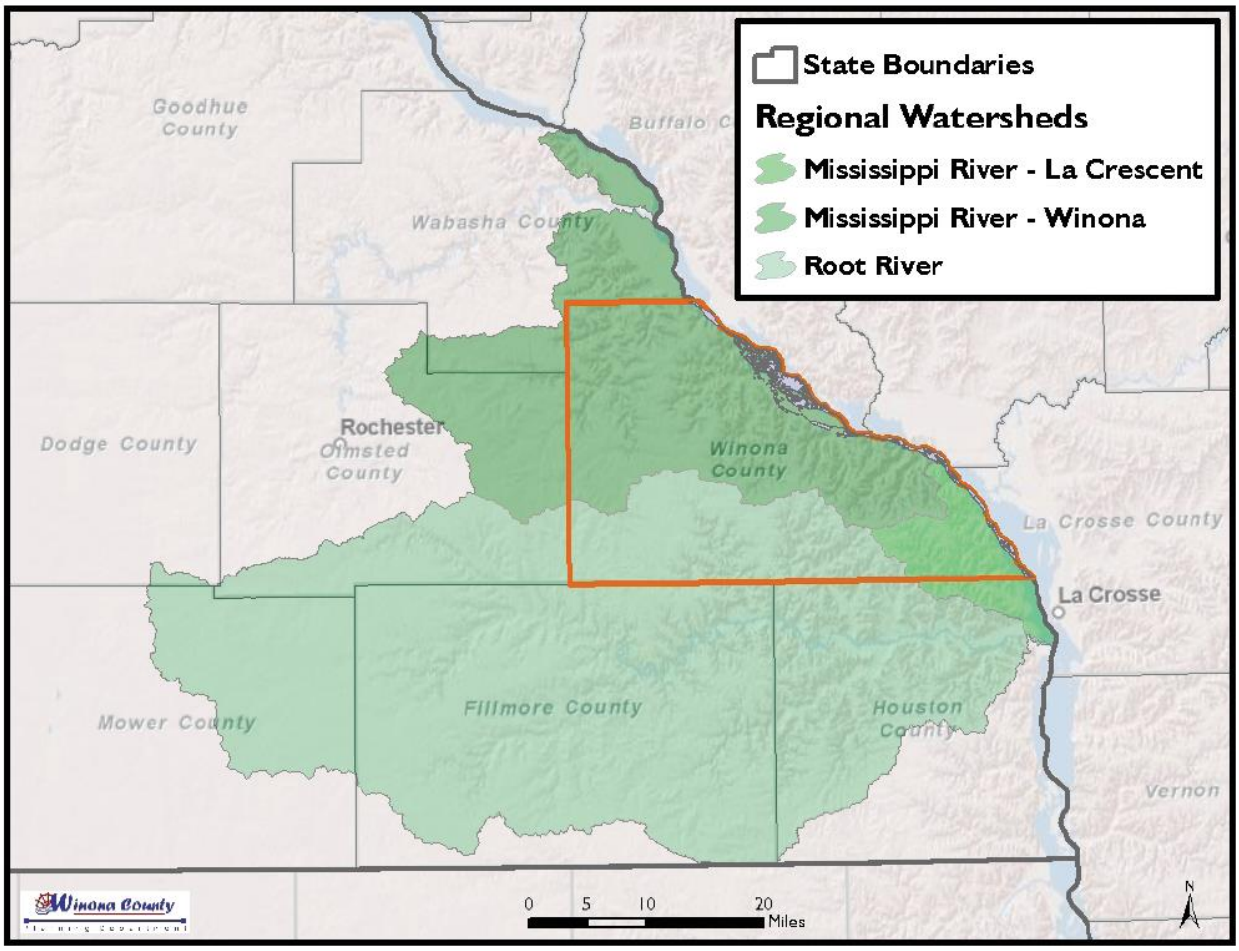
There are many other entities that partner with local organizations to improve water resource management using a watershed context within Winona County. Three groups with a regional scope include the Southeast Minnesota Water Resources Board, the Southeast Minnesota SWCD's Technical Assistance Joint Powers Board, and the Hiawatha Resource Conservation and Development Council. The Southeast MN Water Resources Board is a ten county joint powers board aimed at protecting water resources from a regional perspective. The Hiawatha Resource Conservation and Development Council is a USDA program that encourages local citizens to find solutions to local problems and aims to improve social, economic, and environmental conditions of rural residents. The Southeast Minnesota SWCD's Technical Assistance Joint Powers Board offers technical assistance and leadership for the evaluation, design and construction of BMP's.

5. Goals and Objectives to Address Priority Concerns

The below listed goals are long-term targets for Winona County to achieve through the water planning process and related programs. The objectives are measurable steps to get to those goals.

1. WATER QUALITY

Goal: All Winona County residents have access to safe drinking water.



Objectives

- ✓ Assess the condition of groundwater and the interconnection of land use and associated pollution risks.
- ✓ Assist public water suppliers (PWS) in implementing Actions from their Wellhead Protection Plans and/or managing their 200 foot inner wellhead management zone.
- ✓ Assist private well users in protecting and/or improving their drinking water supplies.
- ✓ Provide educational opportunities to the public and schools on drinking water issues, land use planning, groundwater quality, and the significance of karst geology.
- ✓ Promote buffers around sinkholes and protection measures in vulnerable areas.

Goal: Winona County surface waters support their beneficial uses for recreation, aquatic life, and as sources of drinking water - where applicable.

Objectives

- ✓ Address fecal coliform impairments in surface waters through implementation of TMDL activities.
- ✓ Address turbidity impairments in surface waters through implementation of TMDL activities.
- ✓ Address nitrate impairments.
- ✓ Promote and support aquatic life improvements and protection for trout streams.

Goal: Buffer all sensitive waterways

Objectives

- ✓ Maintain compliance with 50-foot buffer Shoreland Ordinance and Minnesota Buffer Law requirement along public waters.

- ✓ Promote buffers around sinkholes.

2. SOIL EROSION, SEDIMENT CONTROL AND STORMWATER MANAGEMENT

Goal: Minimize the erosion of agricultural soils.

- ✓ Increase implementation and awareness of soil conservation practices.

Goal: Eliminate gully erosion.
Objective

- ✓ Install grass waterways, grade stabilization structures and other applicable practices that reduce erosion.

Goal: Maintain or increase the percentage of perennial vegetation.
Objective

- ✓ Promote and protect forest resources.

Goal: Reduce stormwater runoff from impervious surfaces through site design principles.
Objective

- ✓ All municipal areas meet the principles of the EPA Phase II Stormwater Requirements.

3. NUTRIENT, MANURE, AND HUMAN WASTE MANAGEMENT

Goal: Properly manage animal manure as fertilizer and/or energy source in order to prevent the contamination of ground and surface waters.

Objectives

- ✓ Correct open lot runoff from noncompliant feedlots.
- ✓ Increase the usage and compliance of manure management plans among livestock producers.

- ✓ Promote pasture management.

Goal: Treat human waste to prevent the contamination of ground or surface waters.

Objectives

- ✓ Address Imminent Threats to Public Health from septic systems.
- ✓ Update septic system database and GIS to show all septic systems.
- ✓ Provide operational and maintenance information to homeowners having septic systems.
- ✓ Provide financial assistance to individuals needing replacement systems.
- ✓ Provide alternative disposal options for hazardous waste and pharmaceuticals.

4. WATERSHED MANAGEMENT APPROACH

Goal: Compose watershed assessments and plans for all 68 minor watersheds.

Objectives

- ✓ Promote and utilize a watershed planning approach in dealing with nonpoint source pollution, soil erosion and hydrologic problems.
- ✓ Educate residents and local units of government regarding watersheds and water resources.
- ✓ Promote GIS data sharing and modeling for assessing watersheds and water resource quality.
- ✓ Implement Objectives of the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan.

C. Implementation Schedule - Priority Concerns Objectives and Actions

(Required update for 2019 Amendment to Plan)

The implementation schedule describes how the priority concerns identified in the Water Management Plan will be addressed. Included are specific actions to achieve the stated goals and objectives of the plan. The actions give direction to local agencies and conservation groups by providing details on who is responsible, what the cost will be, how long it will take, and what the benefit will be to water resources within the County. Objectives and Action Items developed in 2010 for the original Implementation Schedule of this Plan were reviewed and accomplishments noted. These are in a table included in the Appendix (pages 67-86).

This Implementation Plan covers all areas of Winona County outside the Root River Watershed. For the plan on the Root River Watershed portion of Winona County, please see the Root River Comprehensive Watershed Management Plan (Root River One Watershed, One Plan 1W1P)).

C.1 WATER QUALITY

Objective A: Assess the condition of groundwater with the interconnection of land uses and associated pollution risks.

Action C.1/A1: Provide updated information to Minnesota Geological Survey (MGS), and the Minnesota Department of Natural Resources (DNR) in their efforts to update the County Geologic Atlas and the Minnesota Department of Health for Minnesota County Well Index (CWI) records where needed.

Time Line	2019-2020
Measureable Goal	Completed Part A and B of County Geologic Atlas
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $5,600
Water Resource Benefit	Accurate Geologic Atlas informs decision-makers

Action C.1/A.2: Continue entry of all water test data into Access-based data tables. Enhance database structure to link data to property records, improve search-ability, and identify those test data that may be used in understanding groundwater trends.

Time Line	2019-2023
Measurable Goal	Enter water test data for 80 tests per year
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $2,000
Water Resource Benefit	Understanding of drinking water quality trends

Action C.1/A.3: Participate as a sub-grantee for the continuation of the Southeast Minnesota Volunteer Nitrate Monitoring Network.

Time Line	2018-2020 (current grant; renewal likely through 2024)

Measurable Goal	Recruit 15 more volunteers 2019-2023
Responsibility	Planning
Financial and In-Kind	Grant $5,000 (2019-2023)
Water Resource Benefit	Provide trend data on nitrate levels in drinking water

Action C.1/A.4: Using Minnesota Department Agriculture Township Testing results, springshed mapping, and other available data, work with state agencies to complete groundwater monitoring/assessment plan for portions of the County that have vulnerable soils and/or have high nitrate influence. Minnesota Department of Health assists with development of watershed-scale Groundwater Restoration and Protection Strategies (GRAPS) to integrate into local water management plans. ***(See Appendix for groundwater vulnerability maps (pages 87-89) and township nitrate testing result maps.)***

Time Line	2021-2023
Measurable Goal	Completed GRAPS and prioritized maps for Mississippi River-Winona Watershed
Responsibility	Planning / Environmental Services
Financial and In-Kind	In-Kind $5,000 (2021-2023)
Water Resource Benefit	Prioritization of areas needing greater protection

Objective B: Assist public water suppliers (PWS) in implementing actions from their Wellhead Protection Plans and/or managing their 200-foot inner wellhead management zone.

Action C.1/B.1: Provide review of Wellhead Protection Plans to Planning Committees for public water suppliers.

Time Line	2019-2023
Measurable Goal	Two Wellhead Protection plans completed / five years
Responsibility	Planning / Environmental Services / SWCD
Financial and In-Kind	In-Kind $1500 each year
Water Resource Benefit	Water supply protection

Action C.1/B.2: Provide support to the cities of Winona, Goodview, Lewiston, St. Charles, Altura, Rollingstone and Utica to carry out their Wellhead Protection Plans (WPP). ***(Utica's Wellhead Protection Plan is also addressed within the Root River Comprehensive Watershed Plan.)***

Municipal community systems vulnerability and Wellhead Protection plan status as of 2019 in Winona County include the following: Altura (vulnerable – completed in 2012), Elba (not started), Goodview (completed in 2016), Lewiston (in progress), Rollingstone (vulnerable – in progress), St Charles (vulnerable – completed in 2014), Stockton (in progress). Utica (vulnerable – completed in 2012), Winona (vulnerable – completed in 2017).

Time Line	2019-2023
Measurable Goal	Partner with one city to implement educational/ administrative objectives contained within their WWP – One every two years
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $800 / year
Water Resource Benefit	Groundwater protection

Action C.1/B.3: Promote pollution prevention programs/practices in wellhead protection areas, such as Minnesota Conservation Reserve Enhancement Program (MN CREP), cover crops, well-sealing, and nutrient management.

Time Line	2019-2023
Measurable Goal	Wellhead areas have 50 acres of cover crops / year; five wells sealed in five years; nutrient management implemented on 50 acres / year
Responsibility	Environmental Services / Planning / SWCD / Health Human Services
Financial and In-Kind	In-Kind $3000; Cover Crop incentives - $1500 each year; Well-sealing - $20,000 each year
Water Resource Benefit	Groundwater protection

Objective C: Assist private well users in protecting and/or improving their drinking water supplies.

Action C.1/C.1: Educate private well owners, property buyers, realtors, lawyers on the well code, the Water Quality Ordinance and proper well construction, maintenance and sealing, and well setbacks.

Time Line	2019-2023
Measurable Goal	1,000 citizens each year receive information
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $5,000
Water Resource Benefit	Groundwater protection

Action C.1/C.2: Promote and/or educate County water users on DNR water use (appropriations) permit requirements (10,000 gal/day or 1 million gal/year).

Time Line	2019-2023
Measurable Goal	Two landowners referred to DNR for information/year
Responsibility	Environmental Services/MN DNR
Financial and In-Kind	In-Kind $500
Water Resource Benefit	Groundwater education

Action C.1/C.3: Host nitrate clinics.

Time Line	2019-2023
Measurable Goal	Provide nitrate tests to 75 households every other year
Responsibility	SWCD
Financial and In-Kind	In-Kind $500 each year
Water Resource Benefit	Ensure safe drinking water

Action C.1/C.4: Provide information to health clinics and hospitals concerning the need to test private wells for common contaminants such as nitrates and coliform and the services of the Environmental Services Department regarding testing.

Time Line	2019-2023
Measurable Goal	Annually, updated information provided to health facilities. They relay information to families with small children
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $500 each year

Water Resource Benefit	Infant health protection

Action C.1/C.5: Subsidize the cost of water test kits for low-income residents through programs such as the Women, Infants and Children (WIC) Program.

Time Line	2019-2023
Measurable Goal	Five families reached per year
Responsibility	Environmental Services / Community Services
Financial and In-Kind	In-Kind $500 each year; WIC-subsidized test kits $500 per
Water Resource Benefit	Infant health protection

Action C.1/C.6: Publish and distribute grant and loan program information for new well construction and well repair such as the USDA, Rural Development, Section 504 Loan and Grant Program, and the Ag Best Management Program.

Time Line	2019-2023
Measurable Goal	50 citizens reached each year
Responsibility	Environmental Services
Financial and In-Kind	In-Kind $200 each year; Available grants
Water Resource Benefit	Groundwater protection

Action C.1/C.7: Provide private well owners with abandoned wells cost share money to properly seal their wells and pursue funding opportunities that will allow the development of a grant and/or County revolving loan program fund for well sealing and well replacement. Unused wells in vulnerable areas of the county and/or wells with the greatest risk of groundwater contamination will be prioritized for available funds. ***(Appendix - pages 87-88.)***

Time Line	2019-2023
Measurable Goal	15 wells sealed/year
Responsibility	Environmental Services / SWCD
Financial and In-Kind	In-Kind $1000; Well-sealing cost / $25,000 per year
Water Resource Benefit	Groundwater protection

Action C.1/C.8: Promote pollution prevention programs in Townships that have a high concentration of wells over the drinking water standard or elevated nitrate levels. ***(Summary of results is located in Appendix – page 89.)*** **Practices that reduce nitrates in groundwater include cover crops, nutrient management plans, well-sealing unused wells.**

Time Line	2019-2023
Measurable Goal	High priority townships have 50 acres of cover crops / year; five unused wells sealed in five years; nutrient management implemented on 50 acres / year
Responsibility	Planning / Environmental Services / SWCD
Financial and In-Kind	In-Kind $3000; Cover Crop incentives - $1500 each year; Well-sealing - $20,000 each year In-Kind $20,000
Water Resource Benefit	Groundwater protection

Action C.1/C.9: Provide outreach and mitigation information, including springshed maps, to private well owners during emergency events (spill contamination).

Time Line	2019-2023; when emergency events occur

Measurable Goal	Public safety announcements annually and as emergency events occur
Responsibility	Environmental Services
Financial and In-Kind	In-Kind / $1000 each year
Water Resource Benefit	Groundwater mitigation and protection

Objective D: Provide educational opportunities to the public and schools on drinking water issues, land use planning, groundwater quality, and the significance of karst geology.

Action C.1/D.1: Provide the public with groundwater educational materials in print and mixed media. Pursue opportunities to increase outreach to public through development of videos that illustrate complex groundwater concepts. Educational materials include workshops and field days provided by the County, SWCD and UM-Extension.

Time Line	2019-2023
Measurable Goal	One outreach event each year
Responsibility	Environmental Services / Planning / SWCD / Extension
Financial and In-Kind	In-Kind $5000 each year
Water Resource Benefit	Groundwater education

Objective E: Promote buffers around sinkholes and protection measures in vulnerable areas. These features are direct conduits to drinking water aquifers.

Action C.1/E.1: Inform landowners owning land with sinkholes of buffer options and setback requirements. The Minnesota Department of Natural Resources sinkhole inventory information is available from the Karst Feature Database of Southeastern Minnesota.

Time Line	2019-2023
Measurable Goal	Ten landowners informed/year
Responsibility	Planning/SWCD/NRCS
Financial and In-Kind	$2,000 In-Kind
Water Resource Benefit	Contamination of drinking water aquifers minimized

Action C.1/E.2: Promote Best Management Practices in areas that have shallow bedrock soils.

Time Line	2019-2023
Measurable Goal	Ten landowners informed/year
Responsibility	Planning/SWCD/NRCS
Financial and In-Kind	$3,000 In-Kind
Water Resource Benefit	Contamination of drinking water aquifers minimized

Objective F: Address fecal coliform impairments in surface waters through implementation of TMDL activities. *(Priority areas for focused efforts are identified within WRAPS for The Mississippi River-Winona Watershed. The TMDL and WRAPS for the Mississippi River – La Crescent Watershed is expected by December 31, 2019. Fecal coliform reduction priority areas for the Mississippi*

River-Winona Watershed are mapped in Appendix (page 90) and are referenced in Actions C.1/F.2; C.1/F.4)

Action C.1/F.1: Develop and implement an *E. coli* local action plan for the Mississippi River-Winona and La Crescent Watershed portions of the County based on the TMDL study and WRAPS.

Time Line	2020-2021 (Development); 2021-2023 (Implement)
Measurable Goal	Prioritized plan completed
Responsibility	Planning/SWCD
Financial and In-Kind	Grant - $8000
Water Resource Benefit	*E. coli* plan for County that is prioritized and targeted

ActionC.1/F.2: Seek funding opportunities and implement practices that address TMDL *E. coli* impairment reduction strategies such as SSTS upgrades, feedlot fixes and nutrient management plans in identified priority areas of the County.

Time Line	2019-2023
Measurable Goal	Ten SSTS upgrades/five feedlot fixes/five new or updated land application records for feedlots for five years
Responsibility	SWCD/Planning
Financial and In-Kind	Cost Share SSTS upgrades $20,000 /feedlot fixes $100,000 / nutrient management planning $10,000
Water Resource Benefit	Reduction in *E. coli* in surface water

Action C.2/F.3: Promote education and awareness of E. coli impairments by providing implementation and latest water quality data as it becomes available from MPCA intensive watershed monitoring for community-led bacteria reduction initiatives.

Time Line	2019-2020 for Mississippi River La Crescent Watershed and 2022 – 2023 for Mississippi River Winona Watershed
Measurable Goal	Reach 100 people each year (2021-2022)
Responsibility	Planning
Financial and In-Kind	Grant $22,000 for two years
Water Resource Benefit	Increased knowledge and public capacity

Action C.1/F.4: Implement up to two rotational grazing plans and/or livestock exclusions covering up to 100 acres per year in identified priority areas identified within the WRAPS.

Time Line	2019-2023
Measurable Goal	Two rotational grazing plans and/or livestock exclusions/year
Responsibility	SWCD/NRCS
Financial and In-Kind	$10,000 per practice implemented
Water Resource Benefit	Improve surface water quality by reducing erosion/runoff

Action C.1/F.5: Provide representation at Basin Alliance for Lower Mississippi of Minnesota (BALMM) meetings.

Time Line	2019-2023
Measurable Goal	Attend four meetings/year
Responsibility	Planning
Financial and In-Kind	In-Kind $1000

Water Resource Benefit	Information sharing regarding regional *E. coli* TMDL

Objective G: Address turbidity impairments in surface waters through implementation of TMDL activities. *(Priority areas to focus efforts are identified within WRAPS for The Mississippi River-Winona Watershed. The TMDL and WRAPS for the Mississippi River – La Crescent Watershed is expected by December 31, 2019. Turbidity reduction priority areas are mapped in the Appendix and referenced in Action C.1/G.2)*

Action C.1/G.1: Develop and implement a TSS local action plan for the Mississippi River-Winona and La Crescent Watershed portions of the County based on the TMDL study and WRAPS.

Time Line	2020-2021 (Development); 2021-2023 (Implement)
Measurable Goal	Prioritized plan completed
Responsibility	Planning/SWCD
Financial and In-Kind	Grant - $8000
Water Resource Benefit	Turbidity plan for County that is prioritized and targeted

ActionC.1/G.2: Seek funding opportunities and implement practices that address TMDL turbidity reduction strategies such as Structural Impoundments, Stream and Streambank restoration, and Soil building education in identified priority areas of the County.

Time Line	2019-2023
Measurable Goal	Ten structural impoundments/three stream restorations/ five years
Responsibility	SWCD/Planning/MN DNR and Trout Unlimited
Financial and In-Kind	Cost Share $600,000
Water Resource Benefit	Improved surface water quality through reduction in erosion and runoff

Action C.2/G.3: Promote education and awareness of turbidity impairments by providing implementation and latest water quality data as it becomes available from MPCA intensive watershed monitoring for community-led turbidity reduction initiatives.

Time Line	2019-2020 for Mississippi River La Crescent Watershed and 2022 – 2023 for Mississippi River Winona Watershed
Measurable Goal	Reach 100 people each year (2021-2022)
Responsibility	Planning
Financial and In-Kind	Grant $22,000 for two years
Water Resource Benefit	Increased knowledge and public capacity

Objective H: Address nitrate impairments in the Mississippi River – Winona Watershed. *(The TMDL report for the Mississippi River – La Crescent Watershed will not have a TMDL for nitrates. Prioritized maps for the County are in Appendix (page91) and are referenced in Actions C.1/H.2; and C.1/H.3)*

Action C.1/H.1: Develop and implement a Nitrate local action plan for the Mississippi River-Winona portions of the County based on the TMDL study and WRAPS.

Time Line	2020-2021 (Development); 2021-2023 (Implement)

Measurable Goal	Prioritized plan completed
Responsibility	Planning/SWCD
Financial and In-Kind	Grant - $8000
Water Resource Benefit	Nitrate reduction plan for County that is prioritized and targeted

Action C.1/H.2: Promote/Encourage/Seek funding opportunities (State Cost-Share/Clean Water Fund/319/EQIP/LCCMR/Whitewater 319 Nitrogen Reduction Project) and implement practices that address nitrate impairment reduction strategies such as cover crops, optimized nutrient management plans, soil building practices, and perennial grasses.

Time Line	2019-2023
Measurable Goal	50 new acres of cover crops in prioritized subwatersheds /year; 50 new acres transitioned to perennials in prioritized areas / five years
Responsibility	SWCD/Planning/Whitewater JPB
Financial and In-Kind	Cost Share $250,000
Water Resource Benefit	Land practices that reduce nitrate loss to groundwater/surface water

Action C.1/H.3: Promote nitrate management improvements that include nitrogen test plots, and precision agriculture.

Time Line	2019-2023
Measurable Goal	Three new participants in these programs each year within prioritized sub-watersheds and sharing lessons learned with other ag producers
Responsibility	SWCD/UMN Extension
Financial and In-Kind	Grant - $2,700/year
Water Resource Benefit	Improve groundwater/surface water quality through optimized nitrogen management

Objective I: Promote and support aquatic life improvements and protection for trout streams in the Mississippi River – Winona, Mississippi River – La Crescent Watersheds

Action C.1/I.1: Develop a local action plan to address fish and bug (aquatic life) impairments and protection measures in the Mississippi River-Winona and La Crescent Watershed using Stressor Identification Reports, TMDLs and Watershed Restoration and Protection Strategies (WRAPS) for these watersheds and available via MPCA for reference. Small streams specifically identified in WRAPS report for protection are Trout Creek, Homer Valley, Pleasant Valley Creek, East and West Burns Valley Creeks, Cedar Creek and Little Trout (Pickwick) Valley Creek.

Time Line	2019-2020
Measurable Goal	Completed action plan
Responsibility	Planning
Financial and In-Kind	$2,000 In-Kind
Water Resource Benefit	Improved stream habitat

Action C.1/I.2: Partner is stream restoration projects within the County that utilize Trout Unlimited's Driftless Area Regional Conservation Partnership Program (RCPP), and other available funding.

Time Line	2019-2023

Measurable Goal	Completed stream restoration projects in two streams/ five years
Responsibility	SWCD/NRCS/DNR/Trout Unlimited
Financial and In-Kind	Grant $600,000
Water Resource Benefit	Improved stream habitat

Objective J: Maintain compliance with 50-foot buffer Shoreland Ordinance and Minnesota Buffer Law requirement along public waters.

Action C.1/J.1: Review GIS land cover maps and aerial imagery to confirm compliance with Shoreland Ordinance and Minnesota Buffer Law as they relate to the DNR Public Waters Inventory; field verify those areas where available information indicates that the 50-foot buffer may not be present.

Time Line	2019-2023; one-third of parcels adjacent to Public waters reviewed/year
Measurable Goal	100% compliance
Responsibility	SWCD
Financial and In-Kind	$100,000
Water Resource Benefit	Improve and protect surface water quality

Action C.1/J.2: Contact landowners with parcels out of compliance with the 50-foot buffer and explain requirements.

Time Line	2019-2023
Measurable Goal	100% compliance
Responsibility	Planning
Financial and In-Kind	Grant $15,000/year
Water Resource Benefit	Protection of surface water quality

Action C.1/J.3: Provide technical assistance for compliance and educational materials regarding opportunities for value-added options for buffered areas (ex. hayable buffers) and for protection of Decorah Edge Influenced-Disappearing Streams (Other Watercourses identified by SWCD; see Appendix (pages 94-98).

Time Line	2019-2023
Measurable Goal	100% compliance
Responsibility	SWCD
Financial and In-Kind	$50,000 In-Kind
Water Resource Benefit	Protection of surface water quality

Action C.1/J.4: Enforce County Shoreland Ordinance and Minnesota Buffer Law.

Time Line	2019-2023
Measurable Goal	100% compliance
Responsibility	Planning
Financial and In-Kind	Grant $74,000/year
Water Resource Benefit	Protection of surface water quality

C.2 SOIL EROSION, SEDIMENT CONTROL AND STORMWATER MANAGEMENT

Objective A: Increase implementation and awareness of soil conservation practices.

Action C.2/A.1: Promote projects and activities that educate and encourage cropping practices that minimize soil erosion. These activities include: cover cropping, contour farming, crop rotation, and conservation cropping systems (No-till, strip-till and ridge-till management). Winona County SWCD and County Extension are sources of educational materials, workshops and field days. *(Prioritized areas of the Mississippi River-Winona Watershed are included in Appendix - page 92.)*

Time Line	2019-2023
Measurable Goal	50 new acres of cover crops in prioritized subwatersheds /year; 50 new acres transitioned to perennials in prioritized areas / five years/three farmers transitioning to conservation cropping systems/year
Responsibility	SWCD/NRCS/Planning/Whitewater JPB
Financial and In-Kind	Cost Share $250,000
Water Resource Benefit	Reduce runoff and pollution of surface water

Action C.2/A.2: Support formation and sustain a community-led, grass roots soil health team. The team will promote soil health principles (protect soil, minimizing soil disturbance, increasing plant diversity, increasing living plant cover and livestock integration)

Time Line	2019-2023
Measurable Goal	Soil health team established 2019-2020/ strategy and information-sharing meetings twice a year
Responsibility	SWCD/Whitewater JPB
Financial and In-Kind	In-Kind $5000
Water Resource Benefit	Improve soil management through peer learning

Action C.2/A.3: Enforce County Soil Loss Ordinance

Time Line	2019-2023
Measurable Goal	100% compliance; Enforcement is initiated based on citizen complaints
Responsibility	Planning/SWCD
Financial and In-Kind	In-Kind $10,000
Water Resource Benefit	Water quality protection

Objective B: Install grass waterways, grade stabilization structures and other applicable practices that reduce erosion.

Action C.2/B.1: Using LiDAR, Soil and Water Assessment Tool (SWAT) modeling and Agricultural Conservation Planning Framework (ACPF), when available, identify hot spots for gullies and other sources of erosion. Contact landowners with options for cost share and technical assistance to address erosion concerns.

Time Line	2019-2023
Measurable Goal	Provide available data to 20 landowners/year

Responsibility	SWCD/NRCS/Whitewater JPB
Financial and In-Kind	Grant-$10,000 (2019); In Kind-$15,000
Water Resource Benefit	Identify areas to concentrate conservation efforts

Action C.2/B.2: Install structural BMPs (grade stabilizations, WASCOBS, retention ponds, terraces) in high-prioritized areas. ***(Prioritized maps are in Appendix – page 90)***

Time Line	2019-2023
Measurable Goal	Ten structural impoundments/three stream restoration projects over five years
Responsibility	NRCS/SWCD
Financial and In-Kind	$600,000/year
Water Resource Benefit	Reduce erosion and improve water quality

Action C.2/B.3: Install waterways and diversions in high-prioritized areas ***(See Appendix – page 90).***

Time Line	2019-2023
Measurable Goal	5,000 feet of waterways and diversions/year
Responsibility	SWCD/NRCS
Financial and In-Kind	$40,000/year
Water Resource Benefit	Control runoff and improve water quality

Action C.2/B.4: Inspect, maintain, and oversee maintenance of conservation practices according to BWSR policy and NRCS inspections/maintenance requirements when appropriate.

Time Line	2019-2023
Measurable Goal	Maintain required inspection schedule
Responsibility	SWCD/NRCS
Financial and In-Kind	In-kind $20,000/year
Water Resource Benefit	Ensure structures continue to provide erosion-control benefits

Action C.2/B.5: Maintain or increase percentage of perennial vegetation

Time Line	2019-2023
Measurable Goal	50 new acres transitioned to perennials within prioritized areas over five years
Responsibility	NRCS/SWCD
Financial and In-Kind	In-Kind $120,000/year
Water Resource Benefit	Improved water quality through increase in perennials

Objective C: Promote and protect forest resources.

Action C.2/C.1: Maintain and assist with Forest Stewardship Plan development through available programs. Provide landowner assistance with implementation after plans are complete.

Time Line	2019-2023
Measurable Goal	Ten new Forest Stewardship Plans developed / five years
Responsibility	SWCD/NRCS/MN DNR

Financial and In-Kind	$20,000/year
Water Resource Benefit	Forested lands providing water resource benefits

Action C.2/C.2: Work with SE Minnesota Landscape Committee and utilize Landscape Stewardship Plans for the Mississippi River-Winona Watershed for identified Conservation Opportunity Areas (COAs) within Winona County *(maps of COAs in Appendix – page 92)*

Time Line	2019-2023
Measurable Goal	Forest management activities implemented in 200 acres/year
Responsibility	SWCD/Planning
Financial and In-Kind	In-Kind $40,000
Water Resource Benefit	Forested lands providing water resource benefits

Action C.2/C.3: Promote goals, objectives and action items of the County Cooperative Weed Management Plan and the County's Aquatic Invasive Species (AIS) Plan to prevent, manage and address invasive species within the County.

Time Line	2019-2023
Measurable Goal	20 landowners contacted/year; technical assistance for 20 weed management projects/year
Responsibility	SWCD
Financial and In-Kind	$110,000/year
Water Resource Benefit	Control and reduction of weeds and invasive species

Objective D: All municipal areas meet the principles of the EPA Phase II Stormwater Requirements.

Action C.2/D.1: Assist City of Winona in implementing elements of Lake Winona/Gilmore Creek Assessment Plan identified BMP targeting practices*. (See Appendix – page 93)*

Time Line	2020-2021
Measurable Goal	Assist with grant applications that provide funding assistance to implement practices
Responsibility	Planning/City of Winona
Financial and In-Kind	In-Kind $1,000 (grant application); $10,000 Assessment Plan recommended practices, such as invasive species removal
Water Resource Benefit	Less competition for native plant species/ phosphorus reductions in lake

Action C.2/D.2: Assist small cities on stormwater retention/infiltration projects through completion of instructional rain garden videos and other educational media.

Time Line	2019-2023
Measurable Goal	Rain garden videos completed
Responsibility	Planning/SWCD
Financial and In-Kind	$10,000
Water Resource Benefit	Reduction of stormwater runoff; increase in pollinator plantings; improved water quality

Action C.2/D.3: Increase education and awareness of Green infrastructure through promotion of rain garden videos and other educational media.

Time Line	2020
Measurable Goal	Presentation to groups (Master Gardeners, etc)
Responsibility	Planning/Extension
Financial and In-Kind	In-Kind - $500
Water Resource Benefit	Reduction of stormwater runoff; increase in pollinator plantings; improved water quality

Action C.2/D.4: Provide representation on Healthy Lake Winona stakeholder group

Time Line	2019-2023
Measurable Goal	Attend ten meetings/year and provide assistance, as needed
Responsibility	Planning
Financial and In-Kind	In-Kind $1000
Water Resource Benefit	Improved citizen capacity for water quality improvements; Training on identification of invasive species, BMPs and best removal techniques

C.3 NUTRIENT, MANURE, AND HUMAN WASTE MANAGEMENT

Objective A: Correct open lot runoff from noncompliant feedlots.

Action C.3/A.1: Seek cost-share funds for and provide administrative and technical assistance for design, installation and implementation of feedlot plans in prioritized areas of the County *(Appendix-page 90).*

Time Line	2019-2023
Measurable Goal	Funds secured through a grant providing cost share
Responsibility	Planning/SWCD/NRCS
Financial and In-Kind	In-Kind and Cost-Share - $250,000/year
Water Resource Benefit	Minimize pollution to surface and groundwater

Action C.3/A.2: Provide feedlot management suggestions and inspections of implemented feedlot projects in accordance with State Standards.

Time Line	2019-2023
Measurable Goal	Inspect 10% of feedlots / year
Responsibility	Planning
Financial and In-Kind	Grant - $40,000
Water Resource Benefit	Minimize pollution to surface and groundwater

Action C.3/A.3: Implement a County Feedlot and Inspection Program based on groundwater and surface water vulnerability.

Time Line	2019-2021 for schedule; 2019-2023 for inspections
Measurable Goal	Inventoried list of feedlots in prioritized watersheds
Responsibility	Planning
Financial and In-Kind	Grant- $20,000
Water Resource Benefit	Inspection/assistance schedule that accounts for groundwater and surface water vulnerabilities

Objective B: Increase the usage and compliance of manure management plans among livestock producers.

Action C.3/B.1: Promote and educate landowners on the benefits of manure/nutrient management plans.

Time Line	2019-2023
Measurable Goal	Educational workshop every other year; One-on-one assistance to 10 livestock producers / year
Responsibility	SWCD/NRCS/Planning
Financial and In-Kind	Grant - $10,000
Water Resource Benefit	Educate landowners to effectively manage manure and nutrients

Action C.3/B.2: Make the AgBMP Loans available for landowners to purchase manure/nutrient management equipment to meet their manure management plans.

Time Line	2019-2023
Measurable Goal	Five landowners use the loan program to address nutrient management / five years
Responsibility	SWCD/MN Department of Agriculture
Financial and In-Kind	Ag BMP loans - $200,000/year
Water Resource Benefit	Manage manure and nutrient loads to protect water quality

Action C.3/B.3: Provide maps of sensitive features to livestock producers and ag producers that use manure applications in operations.

Time Line	2019-2023
Measurable Goal	Five maps distributed each year
Responsibility	Planning
Financial and In-Kind	In-Kind $1000
Water Resource Benefit	Provide education and information

Objective C: Promote pasture management throughout the County.

Action C.3/C.1: Design, implement, and provide technical assistance for pasture management plans in prioritized areas of the county *(Appendix – page 90).*

Time Line	2019-2023
Measurable Goal	10 pasture management plans/five years
Responsibility	NRCS/SWCD
Financial and In-Kind	$100,000
Water Resource Benefit	Increased pasture management throughout the county

Objective D: Address Imminent Threats to Public Health (ITPH) from septic systems.

Action C.3/D.1: Fix ITPH and systems failing to protect ground water and follow up to insure compliance; Ordinance is updated.

Time Line	2019-2023
Measurable Goal	Three ITPH fixes/year

Responsibility	Planning/SWCD/MN Department of Ag
Financial and In-Kind	Ag BMP Loans - $30,000/year
Water Resource Benefit	Protect groundwater from failing systems

Objective E: Update septic system database and GIS to show all septic systems within Winona County.

Action C.3/E.1: Work with all SSTS professionals to insure that they utilize the electronic based system for submitting Compliance Inspection Reports and other information.

Time Line	2019-2023
Measurable Goal	100% of new and upgraded systems are added to database
Responsibility	Planning
Financial and In-Kind	$7,000/year
Water Resource Benefit	Track SSTS information and facilitate data sharing

Objective F: Provide operational and maintenance information to homeowners having septic systems.

Action C.3/F.1: Provide technical assistance to owners of newly installed systems or upon request. Owners of new septic systems review and sign a maintenance checklist with contractors.

Time Line	2019-2023
Measurable Goal	Educational materials distributed to 100 homeowners/year
Responsibility	Planning
Financial and In-Kind	$30,000
Water Resource Benefit	Educate public about septic systems

Objective G: Provide financial assistance to individuals needing replacement systems.

Action C.3/G.1: Participate as a lender of last resort in the MDA AgBMP program.

Time Line	2019-2023
Measurable Goal	Two homeowners participate/year
Responsibility	Planning/SWCD/MN Department of Ag
Financial and In-Kind	Ag BMP Loans - $20,000
Water Resource Benefit	Protects groundwater from failing systems

Action C.3/G.2: Determine income eligibility of ITPH and noncompliant septic system owners and seek Clean Water Fund grant funds and other funding sources for these individuals.

Time Line	2019-2023
Measurable Goal	Securing funding and upgrading low-income noncompliant septic systems as they are identified; three upgrades/year
Responsibility	Planning
Financial and In-Kind	In-Kind/$500/year; Grant $20,000/year
Water Resource Benefit	Protects groundwater from failing systems

Objective H: Provide alternative disposal options for hazardous waste and pharmaceuticals.

Action C.3/H.1: Provide Household Hazardous Waste collection facility that accepts household hazardous waste and pharmaceuticals from residents.

Time Line	2019-2023
Measurable Goal	1,000 pounds of hazardous waste collected/100 pharmaceutical prescriptions dropped off/year
Responsibility	Winona County Sherriff
Financial and In-Kind	In-Kind $15,000/year
Water Resource Benefit	Protects ground and surface water from illegal disposal methods

C.4 WATERSHED MANAGEMENT APPROACH

Objective A: Promote and utilize a watershed planning approach in dealing with nonpoint source pollution, soil erosion and hydrologic problems.

Action C.4/A.1: Promote the formation of and support existing community-based watershed groups and watershed planning activities to address nonpoint pollution issues. Established groups include Rush Pine farmer-led council, Whitewater Watershed Project and farmer-led council, Stockton-Rollingstone-Minnesota City Watershed District, and Healthy Lake Winona.

Time Line	2019-2023
Measurable Goal	Community groups remain active and focused
Responsibility	Planning/SWCD
Financial and In-Kind	In Kind $2000
Water Resource Benefit	Civic capacity increased

Objective B: Educate residents and local units of government regarding watersheds and water resources.

Action C.4/B.1: Make routine presentations to the County Board and in other forums about County Water Management efforts and the condition of the water resources.

Time Line	2019-2023
Measurable Goal	One update / year
Responsibility	Planning
Financial and In-Kind	In-Kind $1,000/year
Water Resource Benefit	Civic capacity increased for protection if water resources

Action C.4/B.2: Compile and maintain watershed/water quality reports pertinent to Winona County on County website in a format that is easily available to public.

Time Line	2019-2023
Measurable Goal	County website includes links to MPCA website for Watershed Reports
Responsibility	Planning/SWCD
Financial and In-Kind	In-Kind $1,000/year
Water Resource Benefit	Citizenry informed of water quality issues

Action C.4/B.3: Support watershed assessment/monitoring work of MPCA and assisting with educational/outreach efforts.

Time Line	2020-2022 for Mississippi River Winona and La Crescent Watersheds
Measurable Goal	Assessment completed
Responsibility	Planning/MPCA
Financial and In-Kind	In-Kind - $15,000
Water Resource Benefit	Watershed-based assessment providing information that is tailored and efficient for local use

Objective C: Promote GIS data sharing and modeling for assessing watersheds and water resource quality.

Action C.4/C.1: Continue to develop GIS data-sharing capacity focused on watershed boundaries among those groups that monitor water and land uses in Winona County and the region.

Time Line	2019-2023
Measurable Goal	Data sharing agreements in place
Responsibility	Planning/GIS
Financial and In-Kind	In-Kind $2,000
Water Resource Benefit	Facilitate data sharing to better assess water resource issues

Action C.4/C.2: Complete the Agricultural Conservation Planning Framework (ACPF) tool and other modeling tools, as needed, on small agricultural watersheds within the County.

Time Line	2019-2020 for watersheds in the Mississippi River-La Crescent Watershed
Measurable Goal	ACPF tool completed
Responsibility	Planning
Financial and In-Kind	Grant - $8,000
Water Resource Benefit	Assess impacts and BMP solutions protect resources

Objective D: Implement Objectives of the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan

Action Item C.4/D.1: Assist Stockton-Rollingstone-Minnesota City Watershed District with Action Items identified within their Implementation Schedule (Pages 60-62).

Time Line	2019-2023
Measurable Goal	Current and approved Watershed District plan
Responsibility	SRMCWD/Planning
Financial and In-Kind	$3000
Water Resource Benefit	Improved delivery of cost-share to landowners

D. Implementation Schedule- Ongoing Activities

(This section is not updated requirement for the 2019 Amendment.)

This section describes other activities and programs implemented and connected to the local water management program not described in the priority concerns.

Wetland Conservation Act (WCA)

The Wetland Conservation Act of 1991 was adopted by the MN State Legislature with the goal of "no net loss" to Minnesota's remaining wetlands. Wetlands that are drained, filled, or excavated must be replaced or restored to an amount equal or greater in size and quality. Winona County through its Planning Department is the Local Government Unit (LGU) that administers the WCA in Winona County except in the City of Winona.

Shoreland and Floodplain Management

The Department of Natural Resources develops the Shoreland and Floodplain programs before eventually delegating their administration to the LGUs. The Winona County Planning Department is the LGU for the unincorporated areas of the County. These programs are developed to preserve and enhance the quality of surface waters, preserve the economic and natural environmental values of shorelands and provide for the wise utilization of waters and related land resources as well as to minimize adverse affects relating to flood events.

Subsurface Sewage Treatment Systems (SSTS)

The Winona County Planning Department is authorized as the LGU to administer Minnesota Rules Chapter 7080 through 7083 SSTS Program. The Department provides technical assistance, education, plan review, and inspections to protect water quality, prevent and control water borne diseases, and prevent or eliminate public nuisance conditions.

Municipal Wastewater Treatment Facilities

The MPCA regulates and monitors activities related to municipal treatment facilities. The County has input if expansion or upgrading of a facility is proposed.

Solid Waste Management

The Winona County Environmental Services Department provides Solid Waste services and programs that protect both ground and surface water in Winona County. The Department strives to promote recycling, hazardous waste management, and sustainable use of resources by providing comprehensive curbside and drop site recycling collection along with a household hazardous waste collection facility that is conveniently open Monday-Friday. Both household and very small quantity generator hazardous waste along with pharmaceuticals are accepted at the facility, thus reducing the toxicity of the waste stream generated in Winona County.

Furthermore, the Environmental Services Department organizes special events throughout the year to collect appliances, tires, and fluorescent bulbs. The department regulates the proper disposal of solid waste by licensing all waste haulers and waste management facilities throughout Winona County. A major focus of the department includes communicating with and educating the public on environmental issues, including waste reduction, proper disposal of solid waste, hazardous waste, and pharmaceuticals.

Wells

Winona County, through its Environmental Services Department, protects groundwater resources by administering the requirements of the Minnesota Wells and Borings code delegated to it by the Minnesota Department of Health. Under this program, the county enforces proper well construction and well sealing practices to ensure wells and borings in the county do not provide a pathway to introduce contamination into our groundwater aquifers.

Hazard Mitigation

The Office of Emergency Management and the Planning Department oversee the Hazard Mitigation Plan. The Plan provides information, resources, and direction for public and private entities to assist in the prevention of natural and man-made disasters through coordinated communication efforts. The Plan strives to protect life, property, and environment through natural resource management and land use planning.

Feedlots

Winona County adopted the Feedlot Program in 1996 to encourage the continued production of agricultural commodities, and to maintain a healthy agricultural community within the County while ensuring that farmers properly manage animal feedlots and animal wastes to protect the health of the public and the natural resources of Winona County. The Planning Department implements the Program that is based on MN Rules Chapter 7020 formulated by the Minnesota Pollution Control Agency. This program allows the County to administer the Winona County Feedlot Ordinance and review and issue permits for new and expanding feedlots up to 1,000 animal units. The Planning also has the authority to review and comment on State administered feedlots.

E. Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan

(This section is not required for the 2019 Winona County Comprehensive Water Management Plan amendment, but serves as the updated Stockton-Rollingstone-Minnesota City Watershed District's Water Management Plan and meets water plan requirements through Minnesota Statutes 103D.401.)

The Stockton-Rollingstone-Minnesota City Watershed District was established in 1958 to primarily address flooding issues. Over the years, updates/revisions to the Watershed District Water Management Plan were made to meet changes in plan requirements and local needs.

Background on Watershed Districts

Watershed Districts are special government entities that monitor and regulate various aspects of water management. Watershed Districts were first authorized in 1955 following the federal Watershed Protection and Flood Prevention Act of 1954. This Act provided federal dollars for the state and local governments to carry out projects designed to protect soil resources and minimize flood damages. Other efforts provided for in the Act included the conservation, development, utilization and disposal of water resources, and the promotion of sound land management practices.

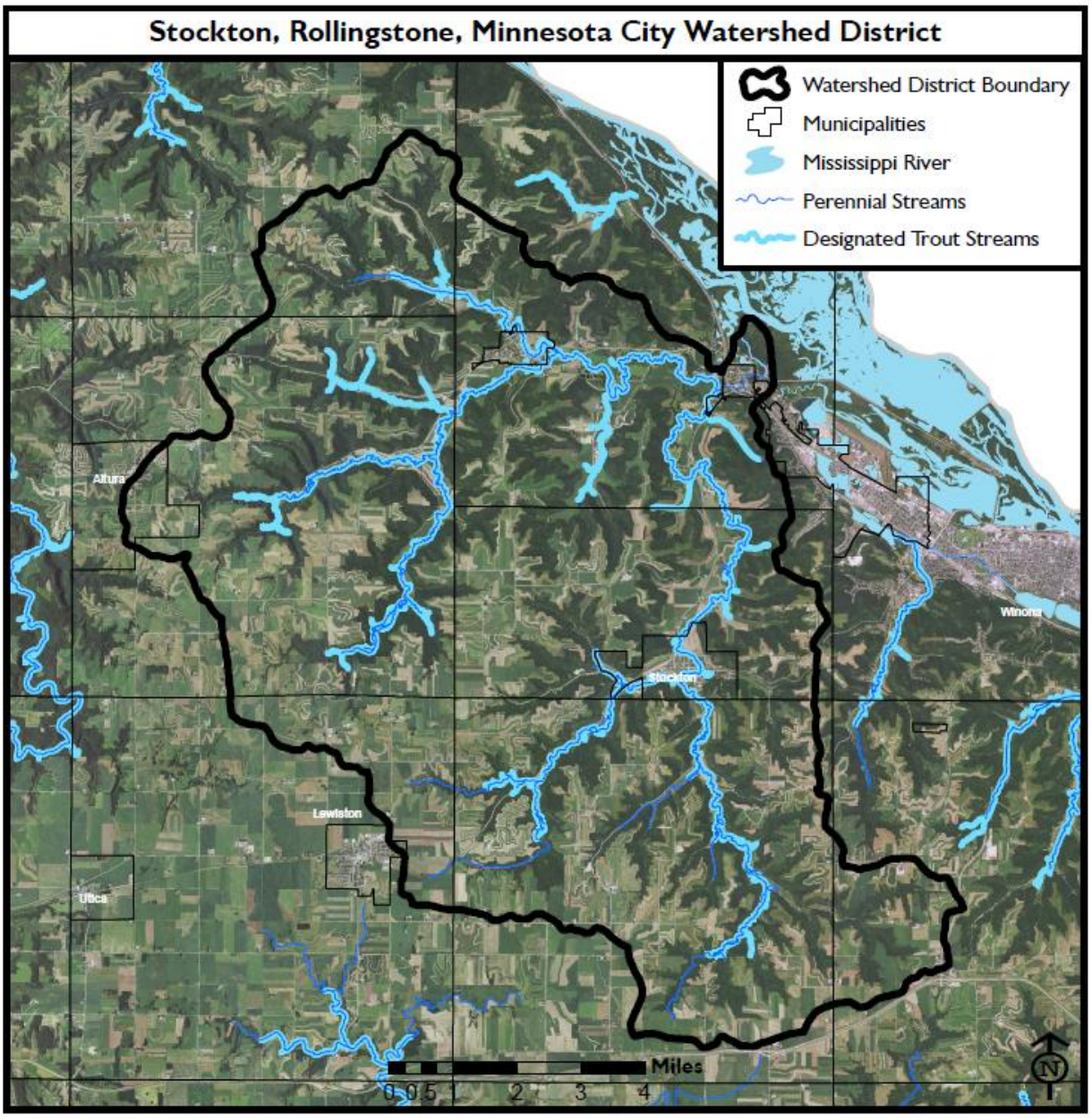
Minnesota Statutes Chapter 103D governs the administration of Watershed Districts; each district has a board of managers appointed by the county commissioners that the district covers. As described in Chapter 103D, the general purpose of watershed districts is to conserve the natural resources of the state through sound scientific principles for the protection of the public health and welfare, and the provident use of natural resources.

History of the Stockton-Rollingstone-Minnesota City Watershed District

The Stockton-Rollingstone-Minnesota City Watershed District has a history of recurrent episodes of floods. The flood history prompted local citizens through their units of government to apply for federal money under the Watershed Protection and Flood Prevention Act, commonly referred to as PL-566. The Soil Conservation Services (SCS) (now named the Natural Resource Conservation Service) responded to this request by visiting the area in 1957

and 1958. Based on these visits, the SCS personnel devised a project to ease the flooding threat.

The Stockton-Rollingstone-Minnesota City Watershed District was established to provide funding to local authorities to carry out the project. On September 12, 1958, the Winona County Board of Commissioners filed a petition with the Minnesota Water Resources Board to form the Watershed District. The District's commencement started on December 26, 1958, with Minnesota City as its place of business.



Stockton-Rollingstone-Minnesota City Watershed District.
In 2019, there were 42 Watershed Districts in Minnesota.

The original flood mitigation project, and it's alternative projects, were considered many times between 1958 and 1967 when the SCS ended all planning efforts. The Natural Resource Conservation Service (NRCS) issued a 2008 assessment report on Garvin Brook, which includes a comprehensive summary of the Watershed District and early efforts to establish flood control structures in the watershed.

Purpose

The Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan describes how the District will approach water resource management over the next ten years. The first Watershed Management Plan occurred in 1959; it was subsequently revised in 1984. However, the Minnesota Water Resources Board never officially adopted the 1984 revision. The plan is a required and necessary revision of the Watershed Management Plan. It incorporates the items listed in the 103D.405 and follows guidance of the Minnesota Board of Water and Soil Resources.

The petition that created the Stockton-Rollingstone-Minnesota City Watershed District outlined the following purposes:

A. For the control or alleviation of damage by floodwaters;
B. For the improvement of stream channels for drainage and for wildlife purposes;
C. For reclaiming wet and overflowed lands;
D. For regulating stream flow and conserving stream water;
E. For providing and conserving water supply for domestic, agricultural, industrial, recreational and other public uses; and
F. Providing for sanitation and public health and regulating the use of streams, ditches, or watercourses for the purpose of disposing the waste.
    1. To monitor livestock feedlots for satisfactory operations;
    2. To monitor release of effluent from community waste treatment plants;
    3. To monitor the operation of individual waste treatment facilities.

The un-adopted 1984 revision also contained these Objectives:

A. Providing water supply for irrigation;
B. Diverting or changing watercourses in whole or part;
C. Repair, improve, relocate, modify, consolidate, and abandon, in whole or part, drainage systems within a watershed district;
D. Imposition of preventative or remedial measures for the control or alleviation of land and soil erosion and siltation of watercourses of bodies of water affected thereby;
    1. To reduce the amount of soil particles and sediment entering the watercourses;
    2. To reduce and prevent soil losses in excess of established soil loss tolerance;
E. Regulating improvements by riparian landowners of the beds, banks, and shores of lakes, streams, and marshes by permit or otherwise in order to preserve the same for beneficial use;

F. Providing for the generation of hydroelectric power;
G. Protecting or enhancing the quality of water in watercourses or bodies of water;
    1. To reduce the amount of phosphorus and nitrogen entering the watercourses;
H. Providing for public health by protecting the quality of ground water in the karst formation, by permit or otherwise, in order to present the same for beneficial uses.

Rules

At the time of the District's inception, many of the present-day environmental regulatory programs were not in place. As federal, state, and local programs expanded, the focus of the Watershed District has narrowed. Prior to 1990, the Watershed District had rules associated with a permitting program. More recently, Watershed District Managers do not feel that a permitting process is necessary, but will plan to modernize their rules before 2021. As a result of the 2007 flood, the Watershed District has taken a renewed interest in implementing effective strategies to reduce flood damage within the District.

Summary of studies on active or planned projects

Presently there are no completed studies on active or planned projects. Past Projects of the Watershed District include:

- The disbursement of $14,850 between 2008-2009 to Peterson Creek, Stockton Valley Creek, and Garvin Brook for removal of debris deposited by August 2007 flood.
- The disbursement of $6,177 in 2005 to repair culverts and improve the crossing over Rollingstone Creek.
- The contribution of $1,508 in 2005 for research on a District dairy farm as part of the University of Minnesota Extension Milkhouse Wastewater Treatment Demonstration Project
- The disbursement of $5,082, between 2002-2003, to replace damaged wing dams on a culvert under Spring Stream Road.

In response to the 2007 flood, the SRMC Watershed District, along with Winona County and the Winona County SWCD, requested the NRCS undertake an assessment of flood control options in the Garvin Brook Watershed. The resulting May 2008 assessment report analyzed a previously completed study by the US Army Corps of Engineers (USACE) completed in 1994 on flood control in the City of Stockton. NRCS recommended that the USACE plan be studied further for economic costs and benefits, hydrology, engineering, and environmental impacts. The NRCS assessment also offers a number of alternatives to the USACE flood control plan. Each alternative is briefly analyzed and includes an estimated cost benefit ratio. Due to lack of funding, the 2008 NRCS assessment report and recommendations have not been acted on. No other studies of the USACE plan or NRCS alternatives have been commissioned, and the Watershed District continues to seek partners and funding for additional studies.

The City of Stockton contracted with Zenk-Read-Trystad & Associates to identify options of flood control measures and provide cost estimates. The consultant identified the reconstruction of the existing channel as the most feasible option. The consultant also recommended that the City of Stockton collaborate with the Watershed District to explore funding options.

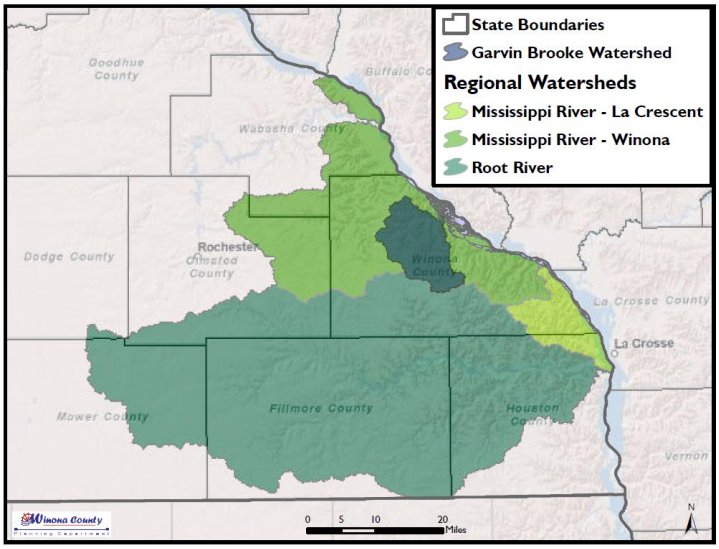
DESCRIPTION

Location and Size

The Stockton-Rollingstone-Minnesota City Watershed District lies with the Mississippi River-Winona Watershed, one of Minnesota's major watersheds. The District corresponds to the geographical extent of the Garvin Brook Watershed and lies entirely within Winona County. The Garvin Brook Watershed covers approximately 15.4-percent of the County, or roughly 100 square miles. The SRMC Watershed District consists of all or parts of Hillsdale, Mount Vernon, Norton, Rollingstone, Warren, Wilson, and Utica Townships. The cities of Minnesota City, Rollingstone, and Stockton lie completely within the District boundaries. The easternmost portions of the Cities of Altura and Lewiston are in the District, and with the annexation of the Gunderson Addition, Goodview now has land with the District.

Population

The 2010 census listed the population of Rollingstone, Stockton, and Minnesota City as 664, 697, and 204 respectively. Rollingstone Township had a population of 701, Hillsdale 945, Warren 629, and Norton 527. From 2000 to 2010, Stockton increased its population by 2.2-percent. Both Rollingstone and Minnesota City experienced population declines, 4.7-percent and 13.2-percent, respectively.



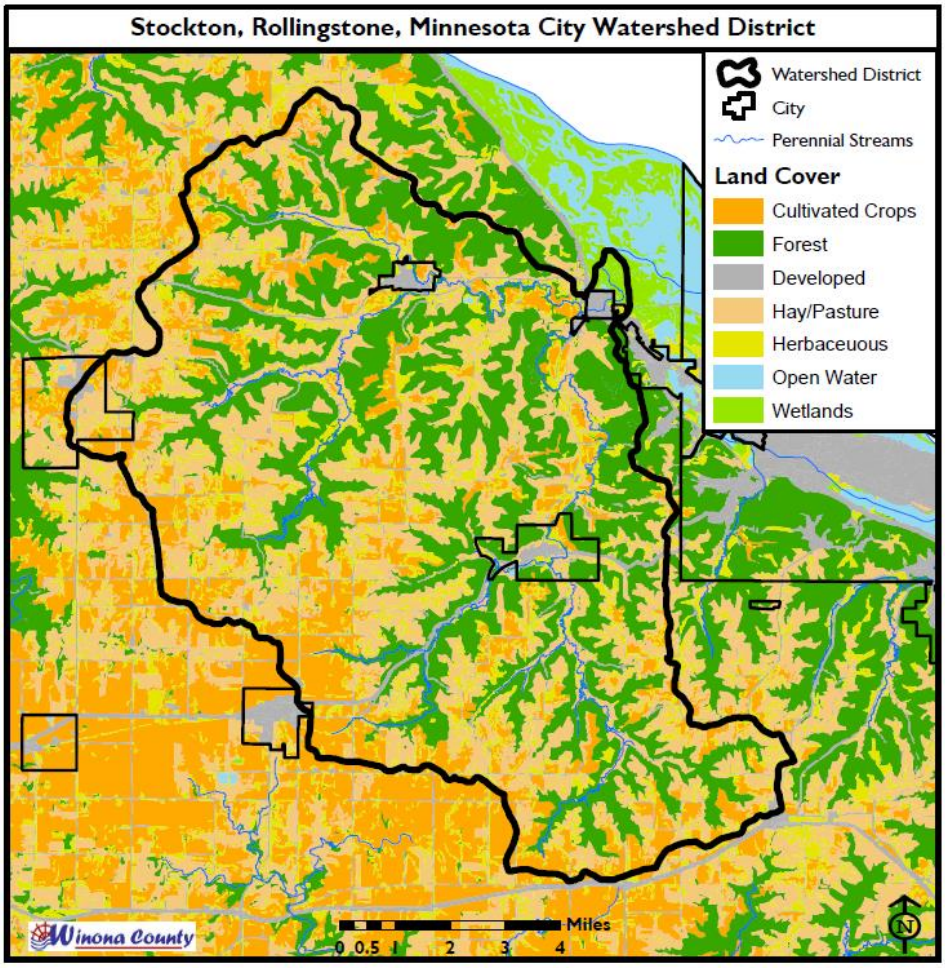
Land Use and Land Cover

The principle land cover in the watershed is cultivated land and forested natural resource and recreation lands. The forested lands are located throughout the watershed but are the primary land use in the southwestern parts of the watershed and mostly consist of corn and soybeans. Perennial vegetation such as hay and alfalfa as well as pasture grass is still a major type of land cover in the watershed due to the topography and strong livestock industry. Livestock operations rely on hay fields and pastures, and this perennial vegetation reduces erosion and requires less nutrient inputs than row

crops. A trend that has been observed in agricultural land use is the continual loss of hay and pasture acres due to the loss of small dairy farms. The Watershed District Managers recognize the economic, environmental, and cultural values associated with livestock production within the watershed.

Public Lands

The 761 acre Bronk Unit of the Richard J. Dorer Memorial Forest, Farmer's Community Park adjacent to Garvin Brook, Minnesota DNR forestry parcels scattered throughout the watershed, as well as recreational areas within the city parks of Stockton, Rollingstone and Minnesota City comprise the public lands within the District. These areas are managed for a variety of purposes such as natural resource protection, open space, forestry, and recreation.



Natural Communities

Prior to Euro-American settlement the land cover of Winona County looked very different from the present day landscape. The Public Land Survey conducted between

1853 and 1855 by Francis J. Marschner documents the native vegetation coverage. The Public Land Survey reveals the area of the Watershed District contained upland hardwood deciduous forests, areas of oak openings and barrens, and some prairies. The Survey also indicates the presence of one obvious wetland complex near Rollingstone.

The Minnesota Department of Natural Resources Biological Survey program between 1990 and 1995 conducted a survey of Winona County Natural Communities and Rare Species. The Biological Survey identifies several natural community remnants within the Watershed District. The booklet that accompanies the Map specifically identifies the upper area in Rollingstone Creek (Rupprecht Creek) and the upstream portion of Garvin Brook. The features mentioned in these areas include a 300-acre mature maple-basswood forest on north facing slopes, mesic oak forest on southeast facing slopes, and lower hardwood forest on the valley floor. These areas support dry cliff communities and are the sources of several waterfalls, springs and groundwater seeps. The site on the upper end of Garvin Brook is significant because of its wet meadow community. This site also contains many rare plant species in its black ash swamp, dry cliff communities, and oak forests.

Priorities for Future Actions

Based on the original purpose of the Watershed District and information compiled during this plans revision process, the problems requiring further actions by the Watershed District include:

- Flood Mitigation particularly in Stockton and downstream to Minnesota City
- Addressing Water Quality Impairments in the Watershed for Fecal Coliform and Turbidity
- Prevent Soil Erosion and Control Sediment

Flood Mitigation in Garvin Brook particularly in Stockton and downstream to Minnesota City

The original purpose of the SRMC Watershed District was to address flooding. The most recent options considered come from a 1994 US Army Corps of Engineers (USACE) study and a 2008 Natural Resource Conservation Service (NRCS) assessment. The 2008 NRCS assessment re-evaluated the 1994 USACE study and then evaluated a number of possible alternatives for consideration. Any future consideration of flood control options should start with this NRCS document. A brief summary of the USACE study and NRCS alternatives is included in the Appendix.

1. Flooding and Flood Damage

   Situated adjacent to rivers and streams, floodplains are areas most subject to recurring floods. Floodplains are therefore flood-prone and hazardous to development activities, if development exceeds an acceptable level.

Scientists, engineers, and planners typically described floods in terms of their statistical frequency. A 100-year flood or a 100-year floodplain describes an event or an area subject to a one-percent probability of a certain size flood occurring in any given year. This concept does not mean such a flood will occur only once in one hundred years. Whether or not it occurs in a given year has no bearing on the fact that there is still a one-percent chance of a similar occurrence in the following year. Since professionals can map floodplains, the boundary of the 100-year flood is common in floodplain mitigation programs to identify areas where there is significant risk of flooding. Any other statistical frequency of a flood is available depending on the degree of selected risk for evaluation – such as 5-year, 20-year, 50-year, or a 500-year floodplain.

Frequency of inundation depends on the climate, the material that makes up the stream banks, and the channel slope. Where substantial rainfall occurs in a particular season, each year, or where the annual flood occurs principally from snowmelt, the floodplain has the possibility to experience inundation nearly every year, even along large streams with very small channel slopes. Where most floods are the result of snowmelt, often accompanied by rainfall, the flood season is sprint or early summer.

The City of Stockton suffered major floods in 1946, 1947, 1950, 1959, 1977, 1991 and 2007 with the 1946, 1959, 1977 and the 2007 floods being especially severe. The Flood Insurance Studies completed in the 1980's for the Cities of Stockton, Minnesota City, and Rollingstone described large flooding events. The work of Corrigan (2004) summarizes the major and historical floods in the LaCrosse Hydrologic Service Area. He noted on July 21, 1991 "Torrential rains fell during the evening hours over the town of Stockton in Winona County, about 4 miles southwest of Winona. The headwaters of Garvin Brook and the drainage area of Stockton Valley Creek received about 5.5 inches of rain between six and seven PM. This is about 1.9 times the 100-year, one-hour rainfall of 2.9 inches for that area. Damages from this flash flood included three homes destroyed and 112 damaged, amounting to about $1.5 million." The most recent flood with the most significant impact in the District including the Cities of Stockton and Minnesota City happened in August of 2007 when over 14 inches of rain fell upstream of Stockton in a 36 hour period. Estimated damages due to this 2007 storm event were in excess of 67 million dollars.

2. Flood Hazard Assessment – Hydrologic and Hydraulic Studies

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 established the authorities for carrying out Flood Insurance Studies within areas of Winona County. Specifically within the District, the Cities of Minnesota City, Rollingstone, and Stockton as well as the unincorporated areas of Winona County have completed Studies. The Studies date from January 19, 1982, February 2,

1982, and July 18, 1982. The FEMA Map Service Center maintains the Studies for public viewing.

The Studies determined the likelihood of 10, 50, 100, and 500-year flooding events. These events have a 10, 2, 1, and 0.2-percent chance respectively of occurring during any one year. An estimation of a 100-year flood flow for any particular stream relies on calculating peak flow data. The 100-year flood is the commonly used term for a flood flow that has a statistical probability of 1 in 100, or one-percent chance of occurring any year. A hydraulic model determines the flood elevation profile (the elevation of the flood along the length of a stream) for the 100-year flood.

Flood Insurance Rate Maps (FIRM Maps) depict areas according to varying levels of flood risk. FIRM Maps were developed for the entire Watershed District and on February 2, 2008, FEMA revised the Flood Insurance Report and the Flood Boundary and Floodway Map for Stockton.

Flood Mitigation is the ongoing effort to lessen the impact of natural disasters on people and property. The Federal Emergency Management Agency has designated mitigation as the cornerstone of emergency management as a means to:

1. Reduce the loss of human life and property damage resulting from flooding.
2. Preserve the natural and cultural values of floodplains.
3. Promote flood mitigation for the prevention of loss and the wise use of floodplains.
4. Avoid actions that exacerbate flooding.

Addressing Water Quality Impairments in the Watershed for Fecal Coliform and Turbidity

The Minnesota Pollution Control Agency (MPCA) has assessed several streams reaches in the District as impaired for recreation and aquatic life. The reasons for the impairments were due to turbidity and or fecal coliform standards that could not be met. Stream reaches listed as impaired are then required to have total maximum daily load (TMDL) studies conducted in order to determine what levels of pollutants are acceptable in order to maintain water quality for a given use, which can then be used in setting pollution reduction goals.

In 2010, the MPCA started addressing water quality monitoring and assessments using a watershed approach and conducted two years of intensive water quality monitoring. Monitoring was followed by a comprehensive assessment and identification of the stressors that caused water quality impairments. By 2016, a TMDL report and Watershed Restoration and Protection (WRAPS) were complete. The next round of the watershed cycle begins in 2020.

Within the Watershed District, Garvin Brook, Peterson Creek, Rollingstone Creek and Stockton Valley Creek all are listed as not meeting water quality standards; fecal coliform is the primary pollutant causing the impairment designation. Garvin Brook, Rollingstone Creek and Stockton Valley Creek do not meet water quality standards for aquatic recreation due to turbidity. A TMDL for Garvin Brook has a target completion date of 2024.

Measuring water clarity

Winona County and the Winona County SWCD are actively engaged in efforts to meet the fecal coliform Total Maximum Daily Load (TMDL) by working with feedlot owners to improve their facilities and develop manure management plans. Potential fecal coliform impairments due to human wastes are also being addressed. Minnesota City constructed a new wastewater treatment plant; the City of Goodview annexed the Gunderson Addition, providing its residents with sewer lines.

In addition to MPCA's water chemistry monitoring and assessments, the Department of Natural Resources (Fisheries Division) is assessing the health of the trout resource. All of the streams that flow within the Watershed District have trout designation for some length. The DNR designation is determined because conditions in the stream can support trout that are self-producing, or can be stocked and managed for trout.

Prevent Soil Erosion and Control Sediment

Soil erosion is the removal of material from the soil surface with water and wind being the most common causes. The potential of soil erosion from water in the Watershed District has been determined to be extreme. Precipitation affects soil erosion and the movement of sediment. Rain and snow is absorbed into the ground but once saturated, overland flow will occur. Vegetative cover can impede the movement of this water. Impervious surfaces, on the other hand, such as streets and roofs, do not provide any infiltration.

The August 2007 flood caused significant movement of soil and bedrock material from gullies, streambeds, and stream banks within the Watershed District. Stream channels widened, widespread deposition of sediment and rock occurred on floodplains, and excessive erosion denuded ravines. Water resource professionals described much of

the County's fluvial landscape after the flood as in a state of instability that is working back to equilibrium.

Conservation practices, such as grass waterways and grade stabilizations, trap sediment from the field and prevent the formation of gullies. The 2007 August Flood caused or exacerbated the degradation of many of these structures.

Soil erosion and sediment control are of concern because loss of soil in agricultural areas results in an overall loss of productivity on crop and pasture lands. Additionally, accelerated sedimentation in streams can change the configuration of stream channels, change patterns of aquatic plant growth, alter habitats including fish spawning areas, and impact macro invertebrate communities.

Implementation Schedule

The implementation schedule addresses the problems outlined in this document and reinforced in the Winona County Water Plan Implementation Schedule. The following reflects the areas of focus for the Watershed District and the administrative and management work that will need to be undertaken each year. The Watershed District Managers intend to review the levy annually in order to budget for implementing items in the implementation schedule as they arise. Partnerships and grant opportunities will also be pursued in order to accomplish the goals of the watershed district.

Objective A: Effectively operate the Watershed District organization according to MN Statutes 103D.

Action A.1 – Provide training and resources to managers on the procedures and laws governing watershed districts under MN Rules 103D.

Time Line 2019-2023, and as new managers appointed

Action A.2 – Review and revise Watershed District Rules as directed under 103D.341.

Time Line 2020

Action A.3 – Complete Annual Report and Audit as required under Minnesota Statutes 103D.351 and 103D.353.

Time Line Annually; 2019-2023

Action A.4 – Maintain an active Advisory Committee and hold yearly meetings of the Advisory Committee.

Time Line 2020 (set up); 2020-2023 (annual implementation)

Objective B – Coordinate activities with other governmental entities and other organizations to provide efficient natural resource protection and management for lands and waters within the Garvin Brook watershed.

Action B.1 – Collaborate with Winona County to explore ways of improving service and becoming more efficient.

Time Line 2019-2023

Action B.2 – Partner with Winona County SWCD on projects within the watershed district of mutual interest.

Time Line 2019-2023

Action B.3 – Partner with the City of Stockton to develop a web-based location to provide current Watershed District information.

Time Line 2019 (set up), 2019-2023 (maintain meeting updates)

Action B.4 – Attend the Winona County SWCD Board meeting biannually.

Time Line 2020, 2022

Action B.5 – Collaborate with partners to seek nontax funding, such as grants, for flood mitigation, water quality improvement and soil erosion reduction projects.

Time Line 2019-2023

Action B.6 – Host an educational event highlighting the Watershed District work and promoting conservation within the watershed.

Time Line 2020
Cost $1,000

Objective C – Focus Watershed District resources to provide the greatest beneficial results for the time, energy and money invested.

Action C.1 – Hire a consultant to analyze hydrology and land use within the Watershed District and provide recommendation for the most suitable and cost effective implementation of practices.

Time Line 2020-2021 (hire consultant); 2022-2023 (implementation of recommended practices)

Action C.2 – Focus resources using a watershed approach which identifies minor watersheds of greatest impact within the Watershed District.

Time Line 2019-2020 (evaluate available modeling tools); 2020-2023 (develop prioritized cost-share for land owners)

Objective D – Flood Mitigation in Garvin Brook particularly in Stockton and downstream to Minnesota City

Action D.1– Examine cost effective options for flood damage reduction through structural means.

Time Line 2020-2021 (Outreach to communities to identify their priorities, receive input from Advisory Committee priorities)

Action D.2 – Examine cost effective options for flood damage reduction through enhanced floodplain/Shoreland management.

Time Line 2020-2021 (outreach to Stockton Valley Creek residents, Trout Unlimited, DNR)

Action D.3 – Provide additional support to landowners that participate in federal and state land conservation programs that result in water retention on their land.

Time Line 2019-2023 (cost share assistance)

Objective E – Addressing Water Quality Impairments in the Watershed for Fecal Coliform and Turbidity

Action E.1 – Promote pasture management and the beneficial impacts of livestock grazing systems on water resources such as increased acres of perennial vegetation for grazing and the benefits of byproducts such as manure as natural fertilizer.

Time Line 2019-2023 (Cost-share)
Partnership with SWCD/NRCS

Objective F – Prevent Soil Erosion and Control Sediment

Action F.1 – Promote projects and activities that educate and encourage cropping practices that minimize soil erosion such as cover cropping, contour plowing, crop rotation, conservation cropping systems (No-till, strip-till and ridge-till management).

Time Line 2019-2023

Action F.2 – Implement a pond cleanout program to help restore storage capacity to erosion control structures that have filled with sediment.

Time Line 2019-2023 (annual outreach to landowners and follow-up cost share)
Cost: $18,000 each year

Action F.3 – Assist in the installation of grade stabilization structures, waterways and diversions in high prioritized areas.

Time Line 2019-2023
Partnership with SWCD/NRCS

E. Appendix

Winona County 2018 Impaired Waters List				
Waterbody Name	**Description**	**Affected Designated Use**	**Pollutants or Stressor**	**Year Listed**
Mississippi River	Lock & Dam #6 to Root River	Aquatic Consumption	Mercury in fish tissue	1998
Mississippi River	Lock & Dam #6 to Root River	Aquatic Consumption	PCB in fish tissue	1998
Bear Creek	Unnamed creek to Rollingstone Creek	Aquatic Life	Aquatic macroinvertebrate bioassessments	2014
Bear Creek	Unnamed creek to Rollingstone Creek	Aquatic Life	Fishes bioassessments	2014
Beaver Creek	T108 R11W S24, west line to Unnamed creek	Aquatic Life	Aquatic macroinvertebrate bioassessments	2014
Big Trout Creek (Pickwick Creek)	Unnamed creek to Mississippi River	Aquatic Life	Aquatic macroinvertebrate bioassessments	2014
Garvin Brook	T106 R8W S17, west line to Rollingstone Creek	Aquatic Life	Turbidity	1996
Garvin Brook	T106 R8W S17, west line to Rollingstone Creek	Aquatic Recreation	Fecal Coliform	1994
Garvin Brook	T107 R8W S2, south line to Mississippi River (Burleigh Slough)	Aquatic Life	Turbidity	2008
Garvin Brook	T107 R8W S2, south line to Mississippi R (Burleigh Slough)	Aquatic Recreation	Fecal Coliform	2008

Peterson Creek	T106 R8W S7, west line to Garvin Brook	Aquatic Recreation	Fecal Coliform	2008
Rollingstone Creek	Unnamed creek to Garvin Brook	Aquatic Life	Turbidity	2008
Rollingstone Creek	Unnamed creek to Garvin Brook	Aquatic Recreation	Fecal Coliform	2008
Stockton Valley Creek	T106 R8W S23, south line to Garvin Brook	Aquatic Life	Turbidity	2008
Stockton Valley Creek	T106 R8W S23, south line to Garvin Brook	Aquatic Recreation	Fecal Coliform	2002
Whitewater River	Beaver Creek to T108 R10W S1, north line	Aquatic Consumption	Mercury in fish tissue	1998
Whitewater River	South Fork Whitewater River to Beaver Creek	Aquatic Consumption	Mercury in fish tissue	1998
Whitewater River	South Fork Whitewater River to Beaver Creek	Aquatic Life	Turbidity	2006
Whitewater River, Middle Fork	Crow Spring to North Fork Whitewater River	Aquatic Life	Aquatic macroinvertebrate bioassessments	2014
Whitewater River, Middle Fork	Crow Spring to North Fork Whitewater River	Aquatic Life	Turbidity	2002
Whitewater River, Middle Fork	Crow Spring to North Fork Whitewater River	Aquatic Recreation	Fecal Coliform	2002
Whitewater River, Middle Fork	Crow Spring to North Fork Whitewater River	Drinking Water	Nitrates	2010

Whitewater River, North Fork	Middle Fork Whitewater River to South Fork Whitewater River	Aquatic Life	Turbidity	2006
Whitewater River, South Fork	St Charles Twp Rd 7 to T106 R10W S2, east line	Aquatic Life	Aquatic macroinvertebrate bioassessments	2016
Whitewater River, South Fork	St Charles Twp Rd 7 to T106 R10W S2, east line	Aquatic Life	Turbidity	2002
Whitewater River, South Fork	St Charles Twp Rd 7 to T106 R10W S2, east line	Aquatic Recreation	Fecal Coliform	1994
Whitewater River, South Fork	T106 R10W S1, west line to North Fork Whitewater River	Aquatic Life	Aquatic macroinvertebrate bioassessments	2014
Whitewater River, South Fork	T106 R10W S1, west line to North Fork Whitewater River	Aquatic Life	Turbidity	2002
Whitewater River, South Fork	T106 R10W S1, west line to North Fork Whitewater River	Aquatic Recreation	Fecal Coliform	2002
Whitewater River, South Fork	T106 R10W S1, west line to North Fork Whitewater River	Drinking Water	Nitrates	2010
Winona (Northwest Bay)	Lake or Reservoir	Aquatic Recreation	Nutrient/eutrophication biological indicators	2014
Winona (Southeast Bay)	Lake or Reservoir	Aquatic Recreation	Nutrient/eutrophication biological indicators	2014

Corey Creek	T105 R6W S18, east line to Money Creek	Aquatic Life	Fishes bioassessments	2012
Money Creek	T105 R7W S21, north line to Root River	Aquatic Life	Turbidity	2008
Money Creek	T105 R7W S21, north line to Root River	Aquatic Recreation	Fecal Coliform	2004
Pine Creek	Headwaters to T105 R9W S32, south line	Aquatic Life	Aquatic macroinvertebrate bioassessments	2012
Pine Creek	T104 R9W S4, north line to Rush Creek	Aquatic Life	Aquatic macroinvertebrate bioassessments	2012
Rush Creek	Unnamed cr to Pine Creek	Aquatic Life	Aquatic macroinvertebrate bioassessments	2012
Trout Run Creek	T105 R10W S18, north line to Unnamed creek	Aquatic Life	Aquatic macroinvertebrate bioassessments	2012

Winona County 2018 TMDL List			
Waterbody Name	**Description**	**Pollutant or Stressor**	**TMDL Target End Date**
Mississippi River	Lock & Dam #6 to Root River	PCB in fish tissue	2020
Bear Creek	Unnamed creek to Rollingstone Creek	Aquatic macroinvertebrate bioassessments	2024
Bear Creek	Unnamed creek to Rollingstone Creek	Fishes bioassessments	2024
Big Trout Creek (Pickwick Creek)	Unnamed creek to Mississippi River	Aquatic macroinvertebrate bioassessments	2024
Garvin Brook	T106 R8W S17, west line to Rollingstone Creek	Turbidity	2024
Whitewater River, Middle Fork	Crow Spring to North Fork Whitewater River	Aquatic macroinvertebrate bioassessments	2024
Whitewater River, South Fork	T106 R10W S1, west line to North Fork Whitewater River	Aquatic macroinvertebrate bioassessments	2024
Corey Creek	T105 R6W S18, east line to Money Creek	Fishes bioassessments	2022
Money Creek	T105 R7W S21, north line to Root River	Turbidity	2022
Pine Creek	Headwaters to T105 R9W S32, south line	Aquatic macroinvertebrate bioassessments	2022
Pine Creek	T104 R9W S4, north line to Rush Creek	Aquatic macroinvertebrate bioassessments	2022
Rush Creek	Unnamed creek to Pine Creek	Aquatic macroinvertebrate bioassessments	2022
Trout Run Creek	T105 R10W S18, north line to Unnamed creek	Aquatic macroinvertebrate bioassessments	2022

This Appendix Provides a list of Priiority Concerns, Objectives and Action Items as they were established in 2010 for the 2011-2015 Comprehensive Local Water Management Plan. For the Amendment (2019-2023) Implementation Schedule, some of the original Action Items were deleted (mission accomplished or no longer relevant) and others were added. Action Items of this table might not match the Action Items listed in the Implmentation Schedule of Section C. This Table provides a summary of past accomplishments and overview of next steps.

Priority Concern 1: Water Quality				
Goal: All Winona County residents have access to safe drinking water.				
Objective A: Assess the condition of groundwater with the interconnection of land use and associated pollution risks.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/A.1	Provide updated information to Minnesota Geological Survey (MGS) and Minnesota Department of Health for Minnesota County Well Index (CWI) records where needed.	Winona County provided MGS with its GPS location data, map location data, and other information for Part 1 of the Geologic Atlas Update that commenced in 2011 and completed in 2014.		We are currently providing assistance to DNR in the update of Part 2 of the Geologic Atlas update addressing hydrologic aspects. The Atlas is in development.
C.1/A.2	Utilize the ACCESS well water chemistry database for tracking private wells chemistry data.	All water test data collected through Winona County was entered into the water chemistry database.	Not all well data comes to Winona County for entry into database. Many water test results come from unknown or pre-code water supply wells which limit the usability of that data.	Continue water chemistry data entry as long as data is available. Other uses for available well data are being explored. Reconstruction of the database to enhance features is underway. Integration with the County's GIS system is the desired end results while complying with data practices requirements.
C.1/A.3	Participate as a sub-grantee for the continuation of the Southeast Minnesota Volunteer Nitrate Monitoring Network	Region-wide water quality trends for various drinking water aquifers are now available. Completed sampling as part of the Network through 2018.	Volunteers in the program drop out over time; Program is dependent on state funding.	Recruit new volunteers to fill in areas where original volunteers have dropped out. Sampling continues regionally in conjunction with MDH & MDA.

Objective B: Assist public water suppliers (PWS) in developing and implementing their Wellhead Protection Plans and/or managing their 200-foot inner wellhead management zone. Altura and St Charles projected within next 5 years.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/B.1	Provide representation on the Wellhead Protection Planning Committee for public water suppliers	Altura and St. Charles plans are completed. The County used to be much more involved in these processes but MDH has taken on a greater role. The County still coordinates with local communities and MDH on Wellhead Protection Planning, as needed. SWCD provides review and comments on Wellhead Protection Plan and updates for seven public water suppliers. SWCD also provided assistance to Lewiston on proposed projects within their Wellhead Protection Area.	Staffing commitments may prohibit attendance or representation on wellhead committees.	Continue review and comments on plans and plan updates.
C.1/B.2	Provide information from County records on potential contaminant sources and GIS assistance in mapping and completing potential contaminant source inventory information for public water suppliers.	County provides daily information to realtors, septic contractors, owners, prospective buyers, attorneys, bank/mortgage companies on property file information, septic log histories, and potential challenges associated with site specifics of property.	Staff time is needed to provide information to all.	Continue to provide information as requested.
C.1/B.3	Provide land use and parcel maps to public water suppliers.	Much of this data is now available online. Constant daily inquiries still received by County staff.	This is a time commitment for staff.	Continue to provide information as requested and needed.
C.1/B.4	Provide support to the cities of Winona, Goodview, Lewiston, and Utica to carry out their Wellhead Protection Plans.	The County reviewed the City of Goodview Wellhead Protection Plan (2016 – 2017). The SWCD provides support to Winona County cities, as needed.	Turnover of local government staff and boards is a challenge for maintaining dialogue around Wellhead Protection Plans.	Continue to provide support to Winona County cities, as needed.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.1/B.5	Target pollution prevention programs in wellhead protection areas.	County reviewed, as needed/anticipated, potential changes to land-use within these delineated areas. SWCD worked with RIM Reserve program to promote the program within the Wellhead Protection Area.	Funding to support programs may not be consistent. Areas within wellhead protection areas may be vulnerable.	Promote the RIM Reserve easement (SWCD) program within Wellhead Protection Areas when the program allows.
Objective C: Assist private well users in protecting and/or improving their drinking water supplies.				
C.1/C.1	Educate private well owners on the well code, the Water Quality Ordinance and proper well construction, maintenance and sealing, and well setbacks.	Provide daily information to realtors, septic contractors, the general public, and others on well construction, sealing, well disclosure, and other related topics.	Not all well owners may be aware of well maintenance or potential pollutants to their well; education efforts is a staff commitment.	Continue current levels of education.
C.1/C.2	Host two nitrate clinics a year.	SWCD has hosted nitrate clinics for free water testing about every other year and participated in the MDA Township Nitrate Testing program. Nitrate tests are also available to volunteers within the Volunteer Nitrate Testing Program.	Promotion/advertisement of events	Continue hosting nitrate clinics every other year.
C.1/C.3	Provide information to health clinics and hospitals concerning the need to test private wells for common contaminants such as nitrates and coliform and the services of the Environmental Services Department regarding testing.	County periodically reviews informational materials distributed by Winona Health and answers questions from hospital staff or those referred to Winona County. Review and provide guidance to residents on their water systems as appropriate.	Staff time commitment	Continue providing assistance as outlined.
C.1/C.4	Subsidize the cost of water test kits for low-income residents through programs such as the Women, Infants and Children Program.	County provides free or reduced cost kits to WIC clients referred to us for testing by Community Services. Community Services determines level of financial contribution.	Funding may end.	Continue practice.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.1/C.5	Publish and distribute grant and loan program information for new well construction and well repair such as the USDA, Rural Development, Section 504 Loan and Grant Program, and the Ag Best Management Program.	This information is included on County website and distributed in conjunction with similar septic information. MDA Ag BMP loan program and cost-share assistance is available (for decommissioning of abandoned wells) at the SWCD office, on their web site and their Winona County Fair booth display.	Lack of staff time to update website and communication of grant availability from State agencies	Continue providing information, as needed
C.1/C.6	Provide private well owners with abandoned wells cost share money to properly seal their wells and pursue funding opportunities that will allow the development of a grant and/or County revolving loan program fund for well sealing and well replacement.	During 2011 – 2013, County applied for and received a $30,000 BWSR grant for providing cost-share funds for well sealing that resulted in the sealing of 30 water supply wells. SWCD works with local lenders to provide low interest loans through the MDA Ag BMP loan program. SWCD offers cost-share assistance for decommissioning of abandoned wells.	Economic downturns may prevent landowner from affording their portion of well sealing costs.	Reapply for grant funding at a future date to address ongoing need. SWCD will continue providing cost-share and Ag BMP loans, as needed.
Objective D: Provide educational opportunities to the public and schools on drinking water issues, land use planning, groundwater quality, and the significance of karst geology.				
C.1/D.1	Provide the public with groundwater educational materials in print and mixed media.	The County provides the public access to educational materials through the County website, links to other agencies, and provide person specific materials as requested. Educational materials are provided at the SWCD office, SWCD web site and literature at annual County Fair booth.	Staff commitments prevent more outreach/education efforts.	Both County and SWCD will continue to provide educational materials to public. SWCD will expand efforts to increase public awareness of groundwater issues and karst geology.

GOAL: Winona County surface waters support their beneficial uses for recreation, aquatic life, and as sources of drinking water – where applicable.				
Objective E: Reduce fecal coliform impairments by further implementation of TMDL activities				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/E.1	Continue efforts with Whitewater River Watershed Project in addressing TMDL fecal coliform impairments in the watershed through Bacteria Reduction Project	Efforts focused on reducing the number of failing septic systems within shoreland areas; educating producers about sensitive feature setbacks; increasing adoption of nutrient management plans and promoting BMPs that reduce bacteria; hosting field days and promoting cost share opportunities. The project ended in 2013.	Funding was tied to a grant that ended.	Seek future funding opportunities that promote bacteria reduction strategies. SWCD works with local lenders to provide low interest loans through the MDA Ag BMP loan program to address failing septic systems. BMPs promoted by the SWCD help reduce chances of fecal coliform entering surface waters. Planning Dept Staff provide technical assistance and administration of Ag BMP loans. County also acts as Lender of Last Resort when banks won't back the loans.
C.1/E.2	Host yearly meetings with MPCA and the public to explain ongoing implementation activities in the Garvin Brook Watershed in addressing TMDL fecal coliform impairments.	Was a priority before watershed-based planning, no longer conducting these meetings.		Remove this action item from list.
C.1/E.3	Implement 10 rotational grazing plans.	SWCD works with numerous landowners discussing rotational grazing strategies, but actual plans are usually developed by the USDA NRCS.	The SWCD does not have staff to write rotational grazing plans. USDA NRCS had staff for this in the past, but have a very large work area so amount of assistance is limited.	Continue to promote rotational grazing plans, as needed.

Objective F: The development of turbidity TMDL(s) for streams in the Garvin Brook, Whitewater River, and Root River Watersheds.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/F.1	Host yearly meetings with the MPCA and the public to explain ongoing implementation activities in the Garvin Brook Watershed in addressing TMDL impairments.	Was a priority before watershed-based planning, no longer conducting these meetings.		Remove this action item from list.
C.1/F.2	Participate with the Whitewater River Watershed Project in hosting yearly meetings with the MPCA and the public to explain ongoing Turbidity TMDL activities in the Whitewater River Watershed.	The SWCD has participated with Whitewater River Watershed Project whenever they have conducted these types of meetings. There were numerous meetings with the public to discuss Turbidity TMDL and other impairments relating to MPCA's WRAPS for the entire Mississippi River-Winona watershed, including the Whitewater River watershed.		MPCA has completed the TMDL report; focus now is on targeted areas within these watersheds. Continue working with the Whitewater River Watershed Project the Stockton-Rollingstone-Minnesota City Watershed District, cities and townships and landowners on turbidity issues in Winona County.
C.1/F.3	Participate in writing implementation Plan based on the TMDL study and assist in executing the plan.	Implementation Plan for the Root Watershed is complete. The TMDL for the Mississippi River-Winona Watershed was approved in 2016; an implementation plan based on this watershed TMDL is in progress. The TMDL for the Mississippi River-La Crescent Watershed is in progress.	Addressing three different watersheds at three different stages of the watershed approach can be confusing for staff and residents.	Develop implementation plan for remaining portion of the County, based on completed TMDLs.
C.1/F.4	Participate in the Root River Turbidity TMDL by attending Technical Advisory Committee and Stakeholder meeting and providing information upon request.	The SWCD and County staff assisted with Root River Watershed Restoration and protection Strategies (WRAPS) and the Root River One Watershed One Plan (1W1P) development. Both initiatives included numerous Technical Advisory Committee and Stakeholder meetings.		Continue working in the Root River Watershed with landowners on Turbidity issues in Winona County.

Objective G: The promotion and support of aquatic life assessments for all trout streams in the Buffalo-Whitewater and Root River Watersheds incorporating biological monitoring and biological criteria				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/G.1	Host meetings for local government officials and the public regarding monitoring results and assessments from MPCA Intensive watershed monitoring activities of 2008 and 2010.	MPCA Mississippi River- Winona Watershed grant allowed for funding to support numerous local government official and technical support meetings. Three Citizen Summits allowed an opportunity for citizens to learn about impairments and provide input. These activities supported the Watershed Restoration and Protection Strategy development.	This takes a commitment of staff time.	Completed as part of the Mississippi River-Winona WRAPS process. Civic engagement will continue during development of implementation plan for Mississippi River-Winona Watershed and Mississippi River – La Crescent Watershed.
GOAL: Buffer all sensitive water/land interfaces.				
Objective H: Increase compliance with 50-foot buffer Shoreland Ordinance requirement in agricultural areas along protected waters.				
C.1/H.1	Make presentations to the County Board and Township Officers Association regarding the general results of the Whitewater Watershed Project's Environment and Natural Resources Trust Fund project and discuss the importance of stream side buffers.	Whitewater mailings completed (septic and buffers) County Board approved work plan in 2010 and implementation started in 2011, completed by 2014.		Funds tied to this specific action item ended, but with recent buffer ordinance in place and other state funding, compliance of buffers will be strengthened.
C.1/H.2	Field verify those areas where the GIS land cover information indicates that the 50-foot buffer is not present.	SWCD reviewed parcels for compliance and transfers non-compliant parcels to the County for enforcement protocol. The County has set up a process for gaining compliance with the 50 ft. buffer. To date we have the majority of our buffers installed.	Enforcement capacity and continued funding	Monitor the 98% complaint parcels and work on remaining 2% non-compliant parcels. SWCD will check 1/3 of parcels each year in a randomized inspection.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.1/H.3	Contact those landowners out of compliance with the 50-foot buffer and explain the requirements.	Zoning buffer ordinance and compliance enforcement passed and active; estimated 98% compliance with buffer law and shoreland ordinance.	Continual changes in water course and land ownership require education for owners of buffer law compliance requirements.	SWCD contacts landowners found to be out of compliance or potentially out of compliance, and works with them to try to get them into compliance or confirm compliance. Increase awareness with information at the County Fair and on the SWCD web site. County enforces as, needed.
C.1/H.4	Distribute educational materials regarding Shoreland buffer requirement and government programs that provide assistance to establish and maintain buffers.	The SWCD assists the County with shoreland/buffers. SWCD programs and staff promote RIM Reserve and CRP to help landowners meet setback compliance, and were involved with formulating Winona County buffer ordinance and with establishment of 50-foot buffers along Public Waters. SWCD reached out to all landowners adjacent to Public Waters with a letter about the State Buffer Law, Winona County requirements and technical advice/assistance. Educational materials are available at the SWCD office, SWCD web site and at Winona County Fair booth. SWCD updates the Winona County Planning and Environmental Services Department on landowner buffer compliance as they occur and in aggregate, each November 1st.	State funding may not continue.	Continue to work with landowners to keep or bring them to compliance with the State Buffer law and County Buffer Ordinance. Continue to research about high value perennials for buffer cropping potential. Increase awareness with information at the County Fair and on the SWCD web site. Need to educate landowners of non-agricultural riparian areas regarding bmp's and vegetation requirements of the shoreland ordinance. Mailers / flyers DNR factsheets.
C.1/H.5	Establish a hay-able buffer program.	Not established		With the passage of the buffer law and efforts to seek alternative uses for buffer areas, this action item will be beneficial for landowners. Perennial vegetation is required on the buffers. This vegetation can be hayed or grazed as long as the vegetation is maintained.

Objective I : Promote buffers along sinkholes.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.1/I.1	Provide resource support to the Minnesota Geological Survey and the University of Minnesota Department of Geology and Geophysics for field assistance and verification in updating the Karst Feature database utilizing LiDAR	Winona County provides locational data for new sinkholes as appropriate. MNDNR acts as a major contributor to maintaining the karst feature database. Support provided as needed.	Staff commitment and dynamic nature of karst (impacts accuracy and completeness).	Continue current practices.
C.1/I.2	Inventory surrounding land use around sinkholes	Completed in conjunction with all conditional use permits and variances, which are conducted as part of a public hearing/review process. Inventory information assists the volunteer boards, make more informed land-use decisions based on risk associated with type of use, and site selection.	Staff time commitment	Continue to support.
C.1/I.3	Inform landowners owning land with sinkholes of buffer options and setback requirements.	County-reviewed with property owners for site and project specific proposals, to assure the property owner makes the most well-informed decision possible. SWCD staff informs landowners of the issues with sinkholes and suggests buffering options to help reduce the potential of groundwater contamination from runoff entering the sinkholes. Educational materials are available at the SWCD office, SWCD web site and at Winona County Fair booth. SWCD also promotes the RIM Reserve easement program for sinkhole buffers when the program allows.	Staff time commitment and landowner unwillingness/ apprehension to give up cropland for buffers or diversions around sinkholes	Continue our information/educational efforts.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.1/I.4	Support the regional ENRTF MN DNR springshed mapping for trout stream management by identifying targeted landowners and making contacts to them regarding the project.	Coordination and support has been granted.		Continue support as needed.

Priority Concern 2: Soil Erosion, Sediment Control and Stormwater Management				
GOAL: Minimize the erosion of agricultural soils.				
Objective A: Promote programs that encourage soil conservation.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.2/A.1	Promote projects and activities that educate and encourage cropping practices that minimize soil erosion. Cover cropping, contour farming, crop rotation, conservation cropping systems (No-till, strip-till and ridge-till management.)	Most of the BMPs promoted and/or cost-shared by the SWCD, among other things, reduce erosion on agricultural soils. The SWCD has offered a limited amount of cost-share for cover crops when the budget allows. NRCS has offered a larger portion of cost-share for these projects, but their funding has also been limited at times. Educational materials can be found at the SWCD office, SWCD web site and at their Winona County Fair booth.	Consistent funding is needed. More research needed to document benefits of cover crops and impact to yield.	With staff trained in soil health principals and grant funding, the SWCD plans to expand the promotion and education on soil health practices that may reduce our dependency on more expensive structural BMPs. Whitewater JPB's new 319 grant provides cover crop incentives for farmers within targeted sub-watersheds.

GOAL: Eliminate gully erosion.				
Objective B: Install grass waterways and grade stabilization structures.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.2/B.1	Identify hot spots for gullies and other sources of erosion. Contact landowners with options for cost share and technical assistance to address erosion concerns.	SWCD evaluates sites of landowners who come in and express interest. If their sites show a need, they are prioritized with comparison to all other applicants. If the site has the need, it is most efficient use of the funding, and more likely to result in long-term positive results for sites of willing participants. SWCD works with the County GIS in the development and use of HSPF modeling to help identify "hot spots" for gullies and other sources of erosion. SWCD and NRCS offers technical and cost-share assistance for numerous BMPs. HSPF modeling and PTMApp was completed for portions of the county that are within the Root River watershed. This will help identify "hot spots" for gullies. (These activities will be addressed within the Root River Comprehensive Watershed Management Plan.) SWAT modeling was completed for the Mississippi River-Winona Watershed.	More interested landowners than funds allow.	SWCD and NRCS work with landowners to increase the adoption/use of cover crops by 500 acres/year. SWCD and NRCS will work with landowners throughout the county and in priority areas to identify erosion problems and offers potential solutions. The Whitewater JPB has funds to develop maps identifying suitable locations for structural best management practices within small watersheds.
C.2/B.2	Install 40 grade stabilization structures in high-prioritized areas.	SWCD and NRCS work with landowners to install grade stabilization structures or water and sediment control structures as a need is determined and in high priority areas when funding allows. An estimated 25 new structures were completed.	Structures are expensive and funds are limited; construction costs are increasing.	Continue to offer what cost-share we have for these projects and look for alternative funding sources.
C.2/B.3	Install 5,000 feet of waterways and diversions per year in high-prioritized areas.	SWCD and NRCS work with landowners to install grassed waterways as a need is determined and in high priority areas when funding allows. These efforts resulted in an average of at least 5,000 feet of waterways and diversions per year over the life of this plan. All sites are evaluated for need and value prior to approval of funding.	Waterways need repair work over time.	Continue to promote grassed waterways and diversions as needed. Rain events from 2016 - 2017 show a continued need for additional waterways throughout the county.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.2/B.4	Inspect, maintain, and oversee maintenance of conservation structures according to BWSR guidelines.	SWCD conducts follow-up site inspections to verify the conservation practices are being maintained as required.	Staff time commitment to complete.	Continue to work with landowners to make sure their conservation structures are being maintained, as needed.
Objective C: Promote and protect forest resources.				
C.2/C.1	Maintain and assist with Forest Stewardship Plans.	SWCD, MN DNR and NRCS work with landowners on their Forest Stewardship Plans for various programs including RIM Reserve, CWMA cost-share, CRP and EQIP as the programs allow. SWCD provides a source of potted and bare root trees and shrubs for conservation purposes at sizes, prices and quantities not available through most local and state nurseries. Recent funding to WJPB provides technical assistance for Forest Stewardship Plans and landowner outreach within portions of the Whitewater Watershed through 2018.		Continue to promote forest management through RIM Reserve, CRP, EQIP and any other program that may be available.
Objective D: Promote grass based agriculture.				
C.2/D.1	Increase the adoption of rotational grazing by writing 25 grazing plans	SWCD and NRCS work with landowners to increase adoption of rotational grazing as a need is determined and in high priority areas when funding allows.	Lack of funding and qualified staff	Continue to work with landowners for rotational grazing plans.

GOAL: Reduce stormwater runoff from impervious surfaces through site design principles.				
Objective E: All municipal areas meet the principles of the EPA Phase II Stormwater Requirements.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.2/E.1	Assist small cities on stormwater retention/infiltration projects.	County assisted City of Winona with stormwater projects. A Jefferson Foundation addresses this issue in small communities throughout the County. SWCD assists small communities and their residents with stormwater issues and/or stormwater plan reviews (Winona, Goodview, Rollingstone, Lewiston and St. Charles). GreenCorps member developed rain garden informational videos and outreach brochures. Rain garden funds provide for installation of rain gardens within city of Winona.	Volunteers support needed for rain garden installation/ maintenance.	Continue to provide assistance as needed.

Priority Concern 3: Nutrient, Manure, and Human Waste Management				
GOAL: Treat manure wastes or manage wastes as fertilizer and/or energy source in order to prevent the contamination of ground and surface waters.				
Objective A: Correct open lot runoff from noncompliant feedlots.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.3/A.1	Provide technical assistance for design, installation and implementation of feedlot plans.	The County Feedlot officer provides technical assistance for feedlot plans on an ongoing basis. During 2016, 160.5 hours were spent in technical assistance and outreach to feedlot operators for design, implementation, and installation of feedlot plans. SWCD and NRCS work with landowners providing technical and financial assistance for feedlot fixes as a need is determined and in high priority areas when program funding (319 grant and Clean Water Fund) allows.	Farm economy and feedlot owner cost share rates are cost prohibitive; federal funds have more stringent construction requirements that increase overall cost.	Continue to seek additional funds for landowner assistance.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.3/A.2	Provide maintenance suggestions and inspections of implemented feedlot projects in accordance with State Standards.	The County Feedlot Officer inspects feedlot projects to insure compliance with State standards. During 2016, 722.5 hours were spent in 2016 for compliance inspections of feedlots in Winona County. SWCD and NRCS assistance with feedlot fixes includes maintenance plans and follow-up inspections as required by the programs.	Feedlot and manure management is complex.	SWCD continue to assist the County Feedlot Officer and work with landowners to make sure their feedlot projects are being maintained as needed. Work with County Water Planner to identify vulnerable areas that need more frequent inspections.
C.3/A.3	Provide administrative and technical assistance for correcting manure runoff problems.	In 2016 the County Feedlot Officer ran nine MinnFarm models to calculate nutrient loading (means to assess runoff problem), and issued two Interim feedlot permits while addressing non-compliance (such as manure runoff). SWCD and NRCS work with landowners and the County Feedlot Officer to correct manure runoff problems as needed and when funding allows.	Manure management is complex and the farm economy is poor for landowners to invest in corrective measures at this time.	Continue to seek funding to maintain staff for technical assistance to landowners on manure runoff problems.
C.3/A.4	Implement a County Feedlot and Inspection Program	Winona County implements the County Feedlot and Inspection Program. During 2016, the inspection rate was 11.89% (required rate is 7%) and 134.5 performance credits for feedlot work completed were achieved	Staffing changes (Feedlot Officer) result in reduced inspection schedule some years.	Continue practice. Develop inspection schedule based on ground water and surface water vulnerability.
Objective B: Increase the usage of manure management plans among livestock producers.				
C.3/B.1	Promote and educate landowners on the benefits of manure/nutrient management plans.	Annual meetings are held to promote and educate feedlot producers on manure management plans. SWCD assists the County Feedlot Officer and Extension with education on the benefits of manure/nutrient management plans. The Whitewater JPB produced sensitive features maps for all producers in the watershed; met with every producer and shared information about manure nutrient management. Ten plans were completed using grant funds. Also, stream sampling data on bacteria was shared with all producers in the watershed.	Manure management is complex. Many factors (rainfall, soil conditions, animal diet) impact manure management plans; these plans require regular review and updating. Qualified planners are not easy to find.	Continue to promote.

Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.3/B.2	Make the AgBMP Loans available for landowners to purchase manure/nutrient management equipment to meet their manure management plans.	SWCD works with local lenders to provide low interest loans through the MDA Ag BMP loan program.	AgBMP loans must meet elgibility requirements and funding is becoming more limited; not all applicants will receive funding.	Continue to promote the Ag BMP Loan Program.
C.3/B.3	Assist feedlot operators with development and implementation of Manure Management Plans.	Assistance is given on a regular basis for development of manure management plans. Since January 1, 2017, eleven (11) manure management plans have been developed with the assistance of the County feedlot officer. SWCD and NRCS assistance with feedlot fixes includes development of Manure Management Plans as required by the programs. The Whitewater JPB completed 10 manure management plans with grant funds.	Developing plans takes time	Continue to provide this assistance.
C.3/B.4	Provide livestock producers maps of sensitive features.	Sensitive feature maps are produced for livestock producers upon request. Since January 1, 2017, seven (7) sensitive feature maps have been developed and provided to livestock producers.	Time commitment.	Continue practice.
Objective C : Promote pasture management throughout the County.				
C.3/C.1	Design, implement, and provide technical assistance for pasture management plans.	SWCD and NRCS work with landowners on pasture management plans and financial assistance as a need is determined and in high priority areas when funding allows.	Lack of qualified staff	Continue to promote pasture management plans and provide additional staff training for pasture management planning as funding allows.
GOAL: Treat human waste to prevent the contamination of ground or surface waters.				
Objective D: Address Imminent Threats to Public Health (ITPH) from septic systems.				
C.3/D.1	Incorporate revisions to the SSTS Ordinance to identify and fix ITPH and systems failing to protect ground water.	Ordinance was updated in 2011. SWCD works with local lenders to provide low interest loans through the MDA Ag BMP loan program to help address failing septic systems.	Education to homeowners and Upgrades are costly.	Continue efforts to fix ITPH and failing systems and provide financial assistance for upgrades.

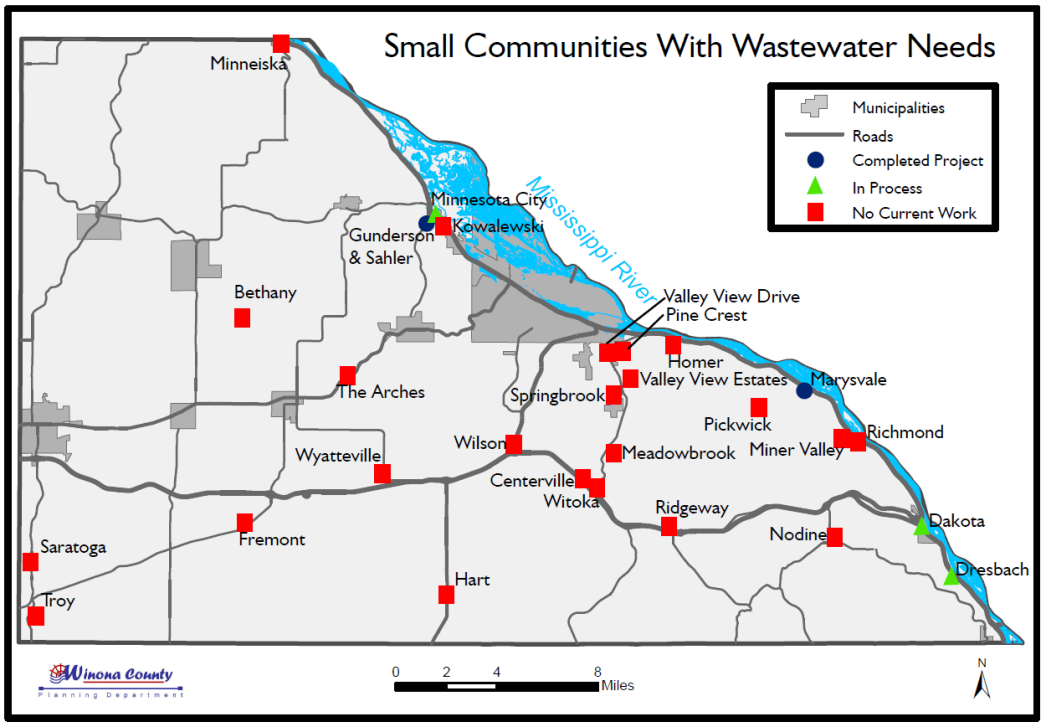
Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.3/D.2	Follow up on all with ITPH to insure compliance is achieved in required time frames.	Follow up and compliance enforcement is a constant and ongoing activity	Staff commitment is needed to fully address ITPH; Enforcement capacity is limited; Undesirable reception from homeowners	Continue efforts to fix ITPH and failing systems.
Objective E : Update septic system database and GIS to show all septic systems within Winona County.				
C.3/E.1	Participate as a sub-grantee to develop a comprehensive SSTS database through the Southeast Minnesota Water Resources Board 2010 Clean Water Fund SSTS Program Enhancement Grant.	Completed. County implemented an ACCESS database system in lieu of this database.	Database entry through Clean Water Fund grant was not useable for comprehensive data retrieval (dates, permitting documentation)	Remove this action item from list.
C.3/E.2	Work with all SSTS professionals to insure that they utilize the electronic based system for submitting Compliance Inspection Reports and other information.	SSTS Permitting & Inspection protocol now mostly reflects State MPCA requirements. The County is continually moving to an electronic delivery of file retention and permit issuance activities.	Still need staff time to work one-on one with SSTS professionals.	Transition to paperless file retention system.
Objective F: Initiate projects with small communities with significant wastewater needs.				
C.3/F.1	Based on updated septic system information, review and update the list of small communities with wastewater needs.	Completed again pursuant to MPCA update of small community needs. List of rankings and priorities updated, and made part of the 2016 SSTS Report	Lack of funding capacity; Created animosity within small communities; Communities have aging infrastructure	Update as necessary
C.3/F.2	Make contact with two communities of greatest need and start task forces.	Still working on Dresbach but have completed a project in Minnesota City, have worked with Dakota in the past and reached out to Minnieska	Costs are too high to construct small community wastewater systems.	Continue until complete

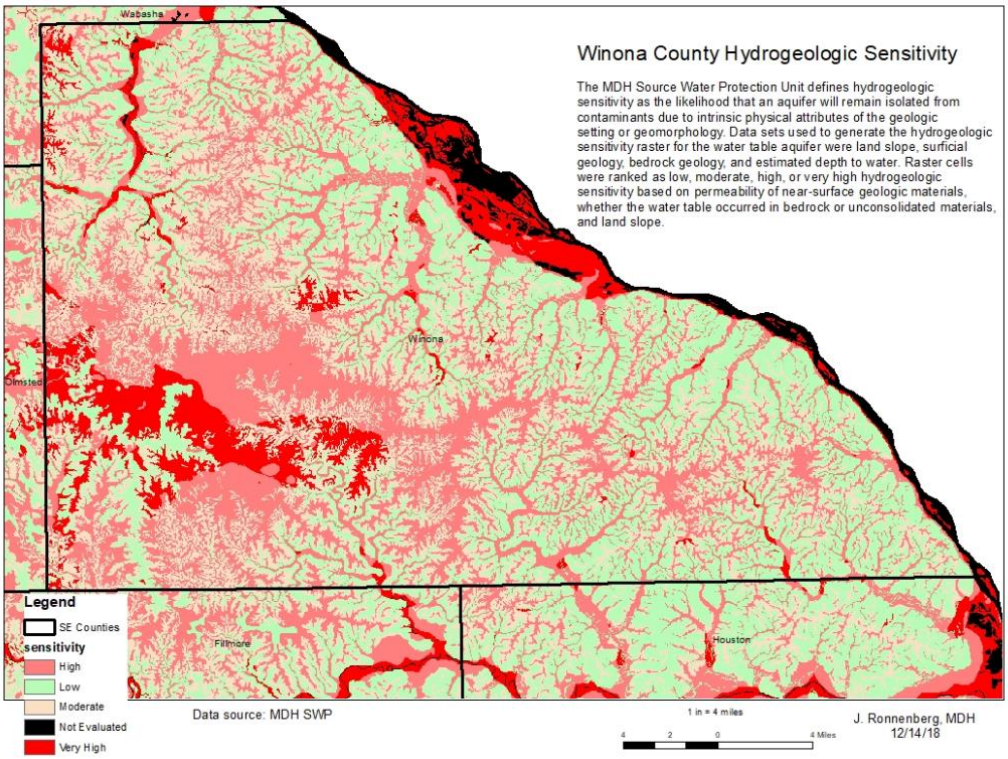
Objective G : Provide operational and maintenance information to homeowners having septic systems.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.3/G.1	Host yearly Operation and Maintenance Workshop	Training provided by University of Minnesota-Extension and MPCA on as-needed basis. A soil workshop was in 2018 for regional contractors (Rushford, MN) with anticipation that Winona County will be well involved with in the field training. Whitewater JPB provided funds to host SSTS maintenance classes for homeowners.	Funding	Continue training.
C.3/G.2	Provide copies of Septic System Owners Guide to owners of newly installed systems or upon request.	This is still being done. The County sends out maintenance information as part of the permitting process and installer reviews this with homeowner.	Education	Continue distribution of educational materials.
Objective H : Provide financial assistance to individuals needing replacement systems.				
C.3/H.1	Participate as a lender of last resort in the MDA AgBMP program.	County acts as lender of last resort, as needed. SWCD works with local lenders to provide low interest loans through the MDA Ag BMP loan program to help address failing septic systems.	Ag BMP loan funding is limited.	Continue lending program.
C.3/H.2	Determine income eligibility of ITPH and noncompliant septic system owners and seek Clean Water Fund grant funds for these individuals.	Periodic grants have provided cost share assistance for low-income homeowners to upgrade their systems.	Cost can still be prohibitive for homeowners	County has received additional funding to provide financial assistance to low–income homeowners.
Objective I : Provide alternative disposal options for hazardous waste and pharmaceuticals.				
C.3/I.1	Provide Household Hazardous Waste collection facility that accepts household hazardous waste and pharmaceuticals from residents.	Winona County continues to operate a HHW facility for county residents to dispose of wastes including pharmaceuticals. Over 5000 people dispose of about 50 tons of hazardous wastes annually.	Staff commitment	Continue current practices.

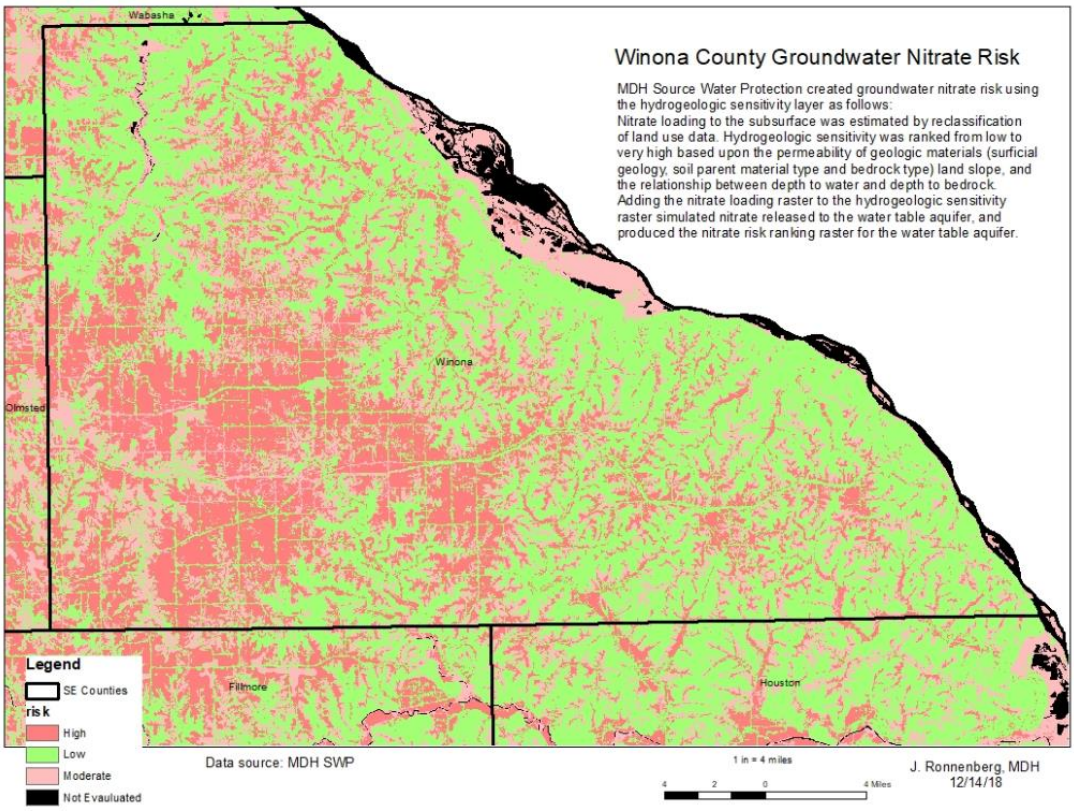
Priority Concern 4: Watershed Management Approach				
GOAL: Compose watershed assessments and plans for all 68 minor watersheds				
Objective A: Promote and utilize a watershed planning approach in dealing with nonpoint source pollution, soil erosion and hydrologic problems.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.4/A.1	Promote the formation of community-based watershed groups and watershed planning activities in the watersheds of Big Trout, Gilmore Creek, Pleasant Valley Creek and Rush Pine.	Farmer-led Councils are established in the Whitewater and Rush Pine watersheds. These two Farmer-led Councils have initiated joint outreach and education events. During the WRAPS process for the Mississippi River—Winona Watershed, the Whitewater JPB used extensive outreach and citizen involvement. Outcome of final Citizen Summit during this initiative resulted in grass-roots formation of Healthy Lake Winona group and a BWSR accelerated implementation grant for Lake Winona and Gilmore Creek. Also, Big Trout has had DNR, TU and others working on stream rehabilitation; should prioritize which watersheds to develop citizen groups within next.	Even though community-based watershed groups are grassroots, they need administrative support; Time commitment needed to support.	Continue to foster and support community-based watershed groups. The Whitewater JPB has some funds for the Whitewater Farmer-Led Council to assist with Nitrogen reduction activities.
C.4/A.2	Support and assist established watershed organizations, Whitewater Watershed Project and the Stockton-Rollingstone-Minnesota City Watershed District, in conducting outreach activities and using Winona County and SWCD programs to address watershed problems.	Stockton-Rollingstone-Minnesota City Watershed District (SRMCWD) is supported by County staff with coordination. SWCD provides technical and financial assistance to the watershed boards and their constituents as needed and when the programs allow	SRMCWD plan needs to be updated or incorporated into a One Watershed One Plan initiative.	Continue assistance to these groups through support of their initiatives. Watershed District could be a good candidate to partner on grants since they have dollars for matches (County application – SRMC match).
C.4/A.3	Supply additional support for the Rush-Pine Creek Watershed.	(Actions are detailed within the Root River Comprehensive Watershed Management Plan.)	Staff time commitment	Remove this action item from list.

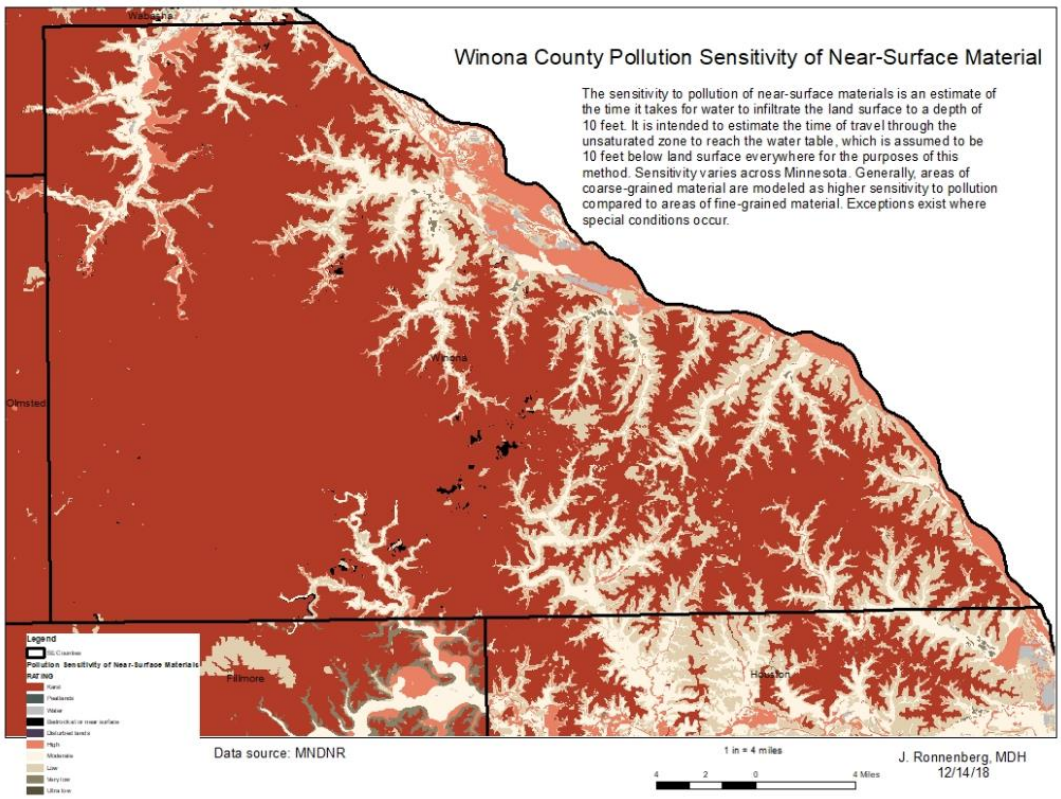
Objective B : Educate residents and local units of government regarding watersheds and water resources.				
Action Item	**Description**	**Accomplishments**	**Challenges**	**Input/Possible Next Steps**
C.4/B.1	Make routine presentation to the County Board and in other forums about County Water Management efforts and the condition of the water resources.	Attendance at and participation in Olmsted, Wabasha & Winona SWCD meetings; annual presentations at budget time to Olmsted, Wabasha and Winona County Boards; involvement in SEMWRB meetings and work groups and BALMM; updates to Winona County Board on Root 1W1P progress. SWCD staff, and County staff, updates SWCD Board of Supervisors, County Commissioners and others on the condition of the water resources and other issues as they arise.	Changes in boards and staff	Continue as needed and requested.
C.4/B.2	Increase school and citizen participation in the MPCA Citizen Stream Monitoring Program, MPCA Citizen Lake Monitoring Program, and macroinvertebrate community monitoring program.	Whitewater JPB supports volunteer participation in the Citizen Stream monitoring efforts; Work with MPCA to support the program through communication with citizens and sign ups.	Lack of staff time to fully engage in school programs.	Continue to support volunteer efforts to monitor water quality.
Objective C: Promote GIS data sharing and modeling for assessing watersheds and water resource quality.				
C.4/C.1	Initiate a project to develop GIS data sharing capacity among those groups that monitor water and land uses in Winona County and the region.	During WRAPS process, MPCA completed mapping of impairments, monitoring sites, etc. County GIS has completed maps for the Whitewater and Rush-Pine Watersheds. County GIS staff has an informal understanding with GIS staff from neighboring counties; data sharing is done, as appropriate, to address water and land use concerns.	Staff time commitment and maintaining current training or modeling	Continue updating maps with most recent data; continue data-sharing focused on watershed boundaries.

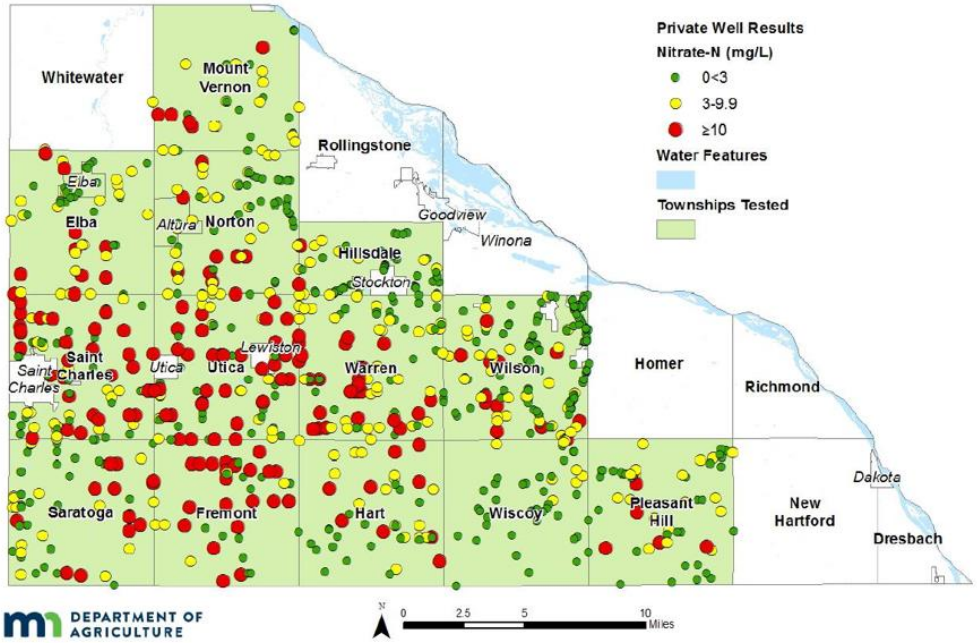
Action Item	Description	Accomplishments	Challenges	Input/Possible Next Steps
C.4/C.2	Evaluate and utilize existing GIS tools for determining the impact of proposed land use activities on watershed hydrology, soil erosion potential, nonpoint pollution runoff potential, and natural resource quality.	LiDAR applications developed; A SWAT model was used for the Whitewater and Garvin Brook Watersheds during MPCA's WRAPS process. During the Root 1W1P planning process, PTMapp was utilized to develop prioritized BMPs and include costs to implement. Additionally, County GIS staff is trained on the use of the USDA's Agricultural Conservation Planning Framework (ACPF), which provides a land use decision tool for landowners. SWCD works with Winona County GIS and Planning Department staff in the development and potential utilization of various models including HSPF, ACPF and SWAT model. (PTMApp is part of the Root so wouldn't be included in this one at this time.)	Modeling efforts take time and money	HSPF-SAM and PTM app training are now available for staff, but are not ready for implementation. As the GIS maps and funding become available, these will be additional tools for land use decisions


Small Communities With Wastewater Needs
Municipalities
Roads
Completed Project
In Process
No Current Work
Minneiska
Minnesota City
Kowalewski
Gunderson & Sahler
Mississippi River
Bethany
Valley View Drive
Pine Crest
Homer
Valley View Estates
Marysvale
The Arches
Springbrook
Pickwick
Richmond
Wilson
Meadowbrook
Miner Valley
Wyatteville
Centerville
Witoka
Ridgeway
Dakota
Nodine
Saratoga
Fremont
Hart
Dresbach
Troy
Winona County
Planning Department
0 2 4 8 Miles
N


Winona County Hydrogeologic Sensitivity
The MDH Source Water Protection Unit defines hydrogeologic sensitivity as the likelihood that an aquifer will remain isolated from contaminants due to intrinsic physical attributes of the geologic setting or geomorphology. Data sets used to generate the hydrogeologic sensitivity raster for the water table aquifer were land slope, surficial geology, bedrock geology, and estimated depth to water. Raster cells were ranked as low, moderate, high, or very high hydrogeologic sensitivity based on permeability of near-surface geologic materials, whether the water table occurred in bedrock or unconsolidated materials, and land slope.
Wabasha
Winona
Olmsted
Fillmore
Houston
Legend
SE Counties
sensitivity
High
Low
Moderate
Not Evaluated
Very High
Data source: MDH SWP
1 in = 4 miles
4 2 0 4 Miles
J. Ronnenberg, MDH
12/14/18

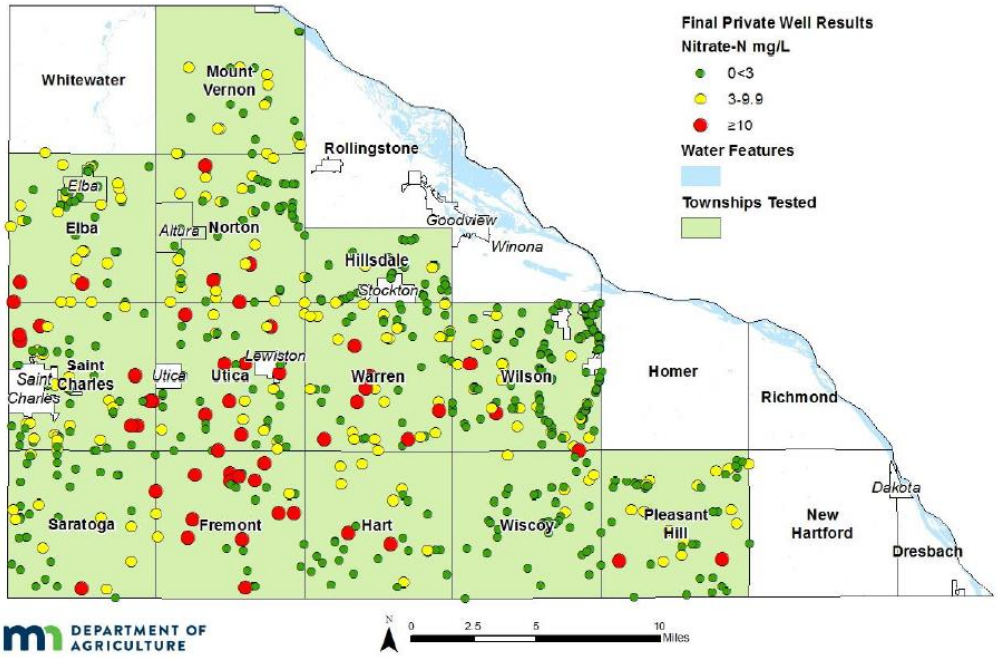

Winona County Groundwater Nitrate Risk
MDH Source Water Protection created groundwater nitrate risk using the hydrogeologic sensitivity layer as follows:
Nitrate loading to the subsurface was estimated by reclassification of land use data. Hydrogeologic sensitivity was ranked from low to very high based upon the permeability of geologic materials (surficial geology, soil parent material type and bedrock type) land slope, and the relationship between depth to water and depth to bedrock. Adding the nitrate loading raster to the hydrogeologic sensitivity raster simulated nitrate released to the water table aquifer, and produced the nitrate risk ranking raster for the water table aquifer.
Wabasha
Winona
Olmsted
Fillmore
Houston
Legend
SE Counties
risk
High
Low
Moderate
Not Evaluated
Data source: MDH SWP
1 in = 4 miles
4 2 0 4 Miles
J. Ronnenberg, MDH
12/14/18


Winona County Pollution Sensitivity of Near-Surface Material
The sensitivity to pollution of near-surface materials is an estimate of the time it takes for water to infiltrate the land surface to a depth of 10 feet. It is intended to estimate the time of travel through the unsaturated zone to reach the water table, which is assumed to be 10 feet below land surface everywhere for the purposes of this method. Sensitivity varies across Minnesota. Generally, areas of coarse-grained material are modeled as higher sensitivity to pollution compared to areas of fine-grained material. Exceptions exist where special conditions occur.
Wabasha
Winona
Olmsted
Fillmore
Houston
Legend
Pollution Sensitivity of Near-Surface Materials
RATING
Data source: MNDNR
1 in = 4 miles
4 2 0 4 Miles
J. Ronnenberg, MDH
12/14/18



Well locations and Nitrate Results from Initial Dataset of Township Testing in Winona County

Final Well Dataset Results
Winona County, Minnesota



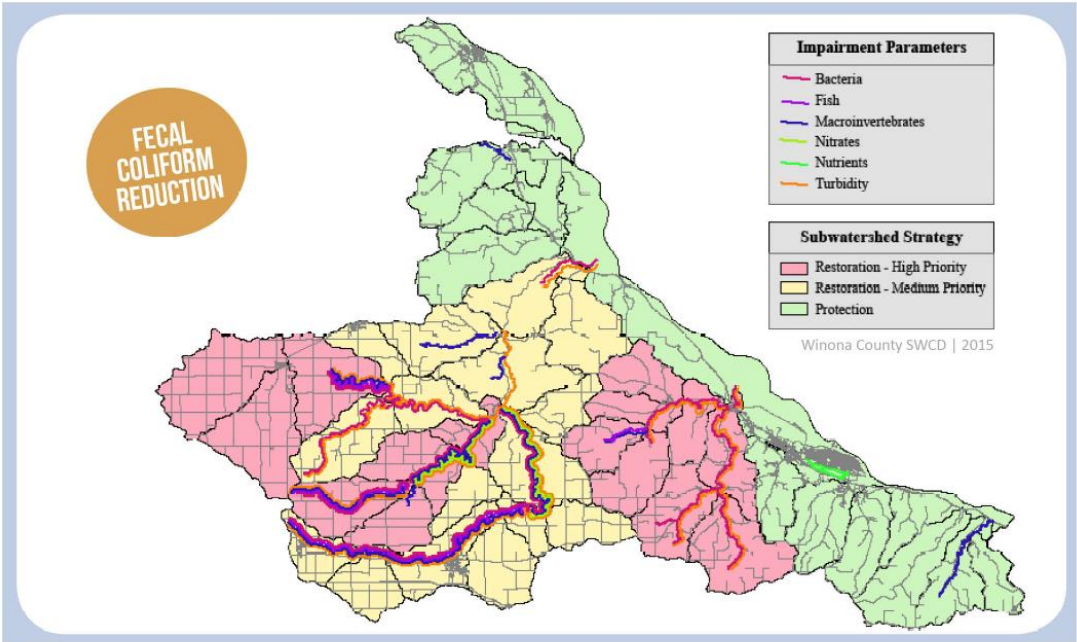


Figure 23. Priority areas for implementation of BMPs for fecal coliform reduction in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 56 – Priority areas for Fecal Coliform reduction practices

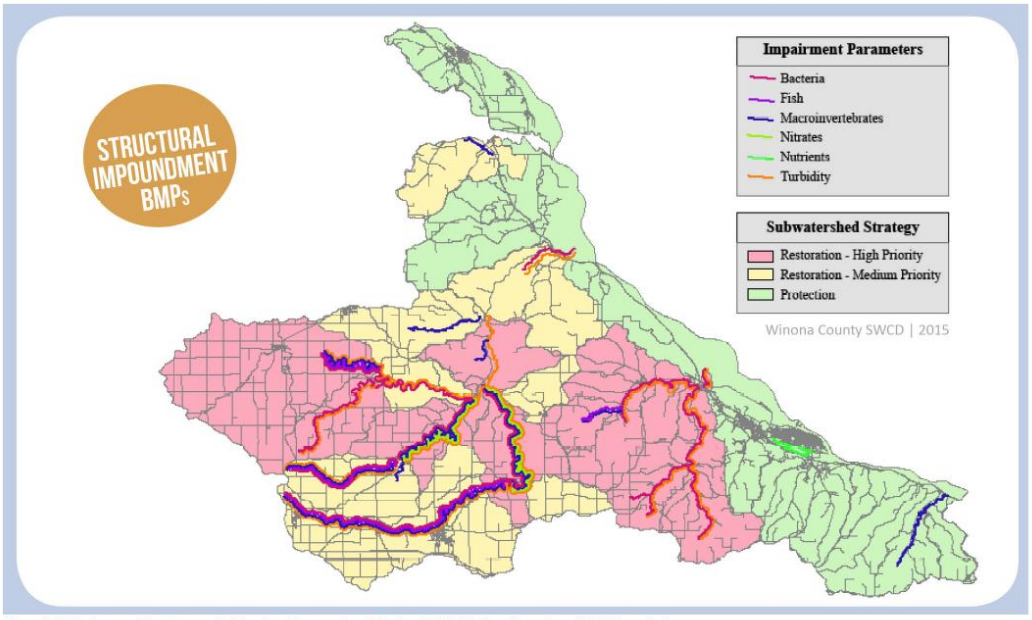


Figure 26. Priority areas for placement of structural impoundments in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 59 – Priority areas for Structural Impoundment BMPs to address turbidity issues

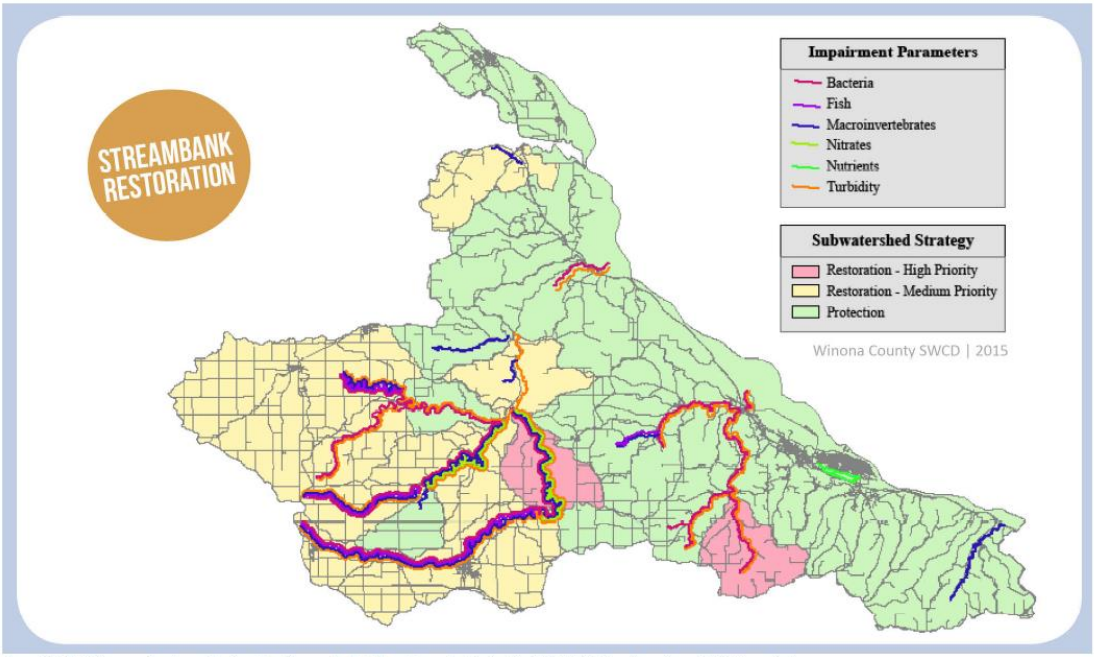


Figure 27. Priority areas for streambank restoration and related erosion reduction in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 58 – Priority areas for Riparian Corridor Management

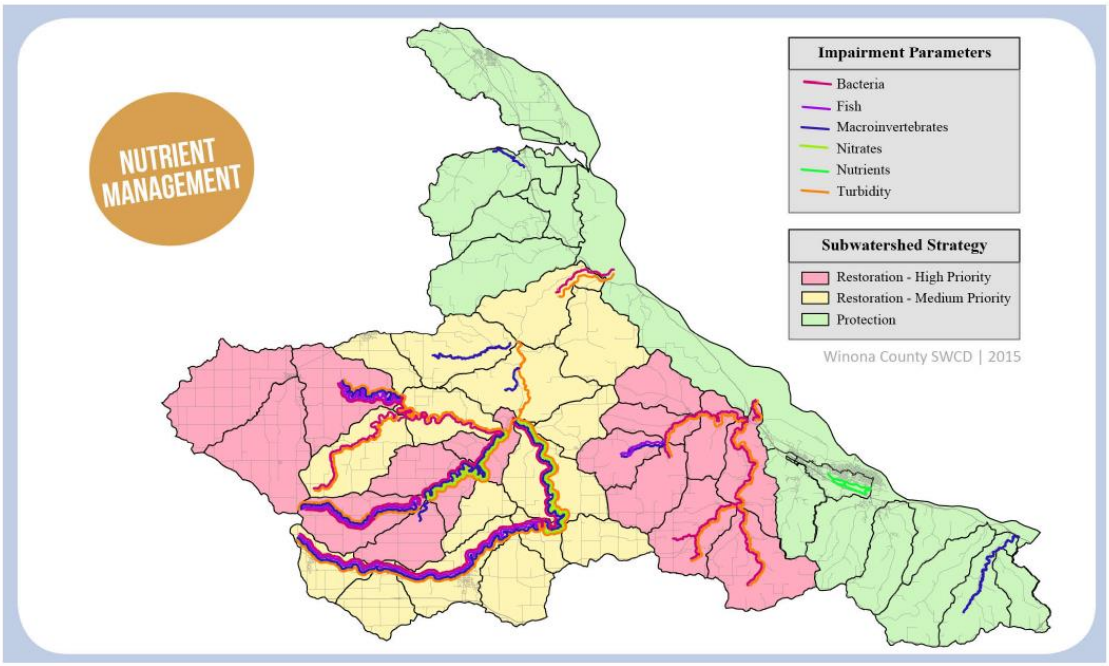


Figure 22. Priority areas for nutrient management implementation in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 55 – Priority areas for nutrient management practices

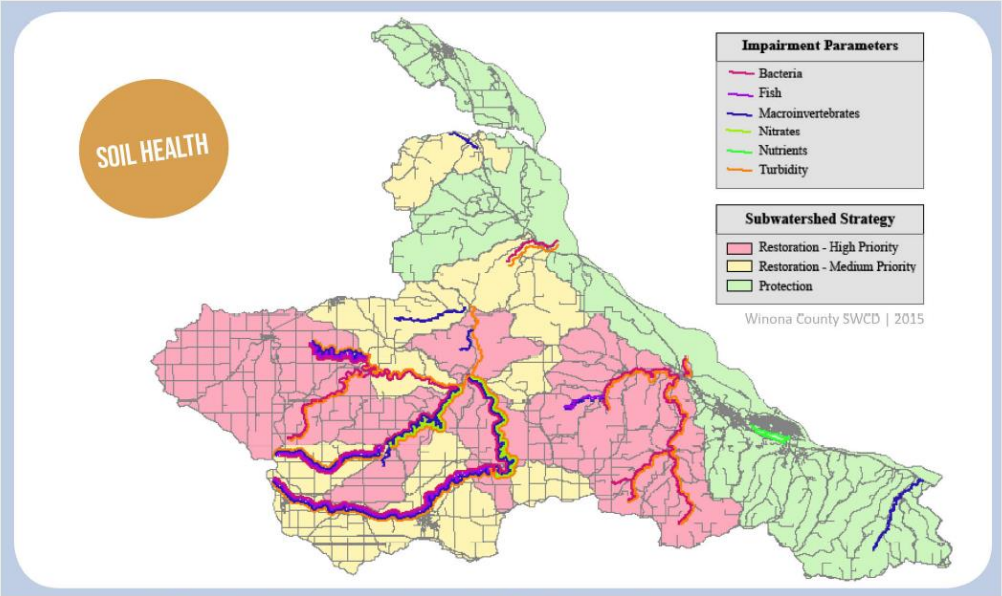


Figure 24. Priority areas for implementation of BMPs to address soil health in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 57 – Priority areas for Soil Health improvement practices

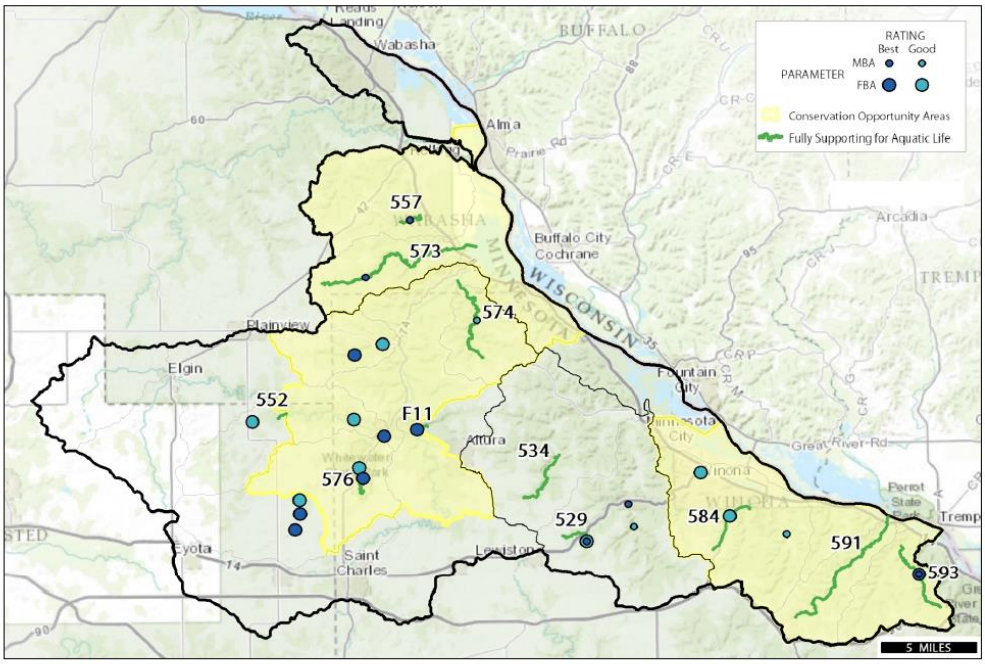


Figure 17. Areas in the MRWW with high biodiversity and full-support for aquatic life use. River reaches in green are those assessed as fully supporting for aquatic life (last three digits of AUID number are also shown). Macroinvertebrate and fishes IBI scores shown as distance from community impairment threshold, where dark blue indicates areas where IBI scores were the best (30-36 points above threshold), and light blue indicates where IBI scores were good (22-29 points above the threshold). Conservation Opportunity Areas (indicated in yellow) from the Mississippi River-Winona Landscape Stewardship Plan were included to show any overlap

Mississippi River-Winona WRAPS, page 47 (map showing areas of high biodiversity and Conservation Opportunity Areas of the MW Watershed). These are focus areas where protection strategies need to be implemented.

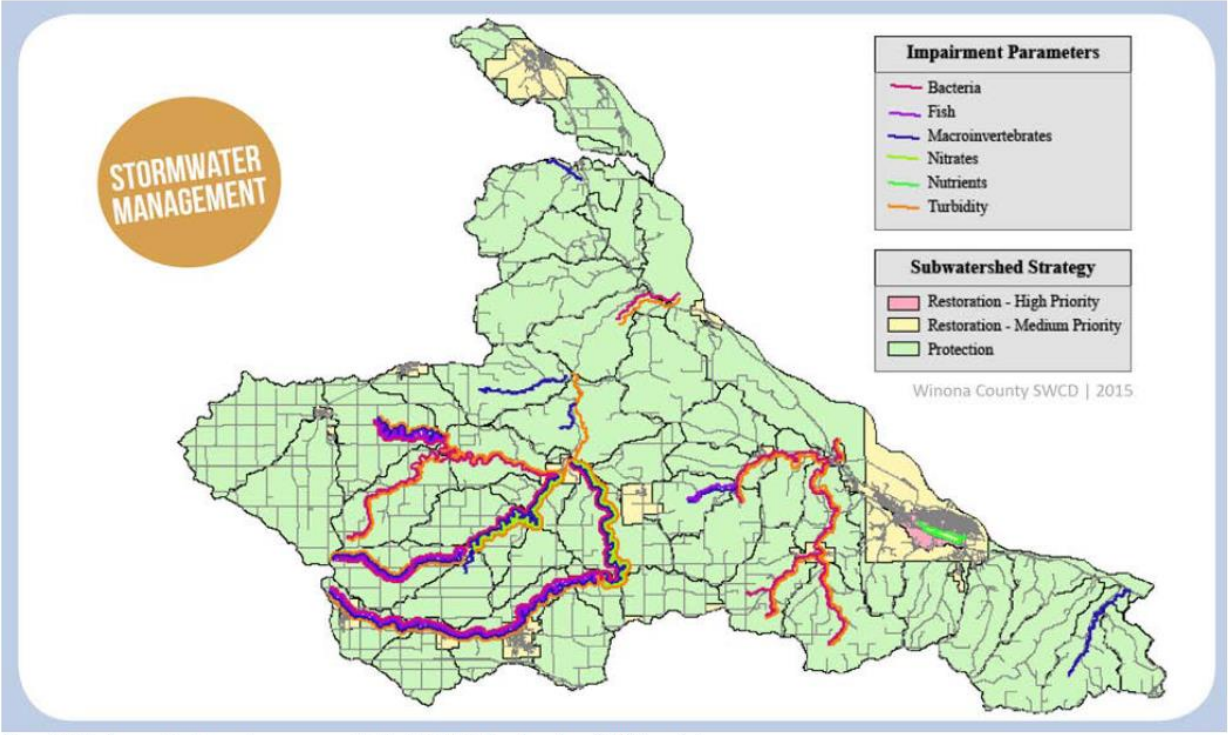


Figure 28. Priority areas for stormwater management in the MRWW. Delineations show 12HUC boundaries.

Mississippi River-Winona WRAPS, page 61 – Priority areas for Stormwater Management

Resolution to Incorporate the Summary of Watercourses into the Stockton-Rollingstone-Minnesota City Watershed District Watershed Management Plan

Whereas; Minnesota Statutes Chapter 103F.48 requires soil and water conservation districts (SWCDs) in consultation with local water management authorities, to develop, adopt, and submit to each local water management authority within its boundary a summary of watercourses.

Whereas; The Board of Water and Soil Resources has adopted Buffer Law implementation Policy #6 'Local Water Resources Riparian Protection ("Other Watercourses")' which identifies steps SWCDs are required to take in developing said inventory.

Whereas; Winona County SWCD has adopted a Descriptive inventory of other watercourses and provided it to Stockton-Rollingstone-Minnesota City Watershed District (SRMCWD) on June 14, 2017.

Whereas; designated "Other Watercourses" do not require a buffer per the Minnesota State Buffer Law but do represent important areas in the County. Protection of them is encouraged and supported through voluntary conservation measures through the SRMCWD Watershed Management Plan; and

Whereas; Minnesota Statutes Chapter 103F.48 requires a local water management authority that receives a summary of watercourses identified under this subdivision must incorporate an addendum to its comprehensive local water management plan or comprehensive watershed management plan to include the SWCD recommendations by July 1, 2018.

Whereas; Minnesota Statutes Chapter 103F.48 does not require a plan amendment as long as a copy of the included information is distributed to all agencies, organizations, and individuals required to receive a copy of the plan changes.

Therefore be it resolved that; The summary of watercourses or "other waters" for SRMCWD shall be incorporated as an addendum in its current watershed management plan.

Be it further resolved that; SRMCWD authorizes staff to provide a copy of the addendum and any supporting information to be distributed to all agencies, organizations, and individuals required to receive a copy of the plan changes.

Adopted at Stockton, Minnesota, this 13th day of August, 2018.

Stockton-Rollingstone-Minnesota City Watershed District

Resolution 2018-020

Incorporate the Summary of Watercourses into the Winona County Comprehensive Local Water Management Plan and the Winona County Portion of the Root River Comprehensive Watershed Management Plan

Minnesota Statutes Chapter 103F.48 requires soil and water conservation districts (SWCDs) in consultation with local water management authorities, to develop, adopt, and submit to each local water management authority within its boundary a summary of watercourses.

WHEREAS, the Board of Water and Soil Resources has adopted Buffer Law implementation Policy #6 'Local Water Resources Riparian Protection ("Other Watercourses")' which identifies steps SWCDs are required to take in developing said inventory; and

WHEREAS, Winona County SWCD has adopted a Descriptive Inventory of other watercourses and provided it to Winona County on June 14, 2017; and

WHEREAS, designated "Other Waters" do not require a buffer per the Minnesota State Buffer Law but do represent important areas in the County. Protection of them is encouraged and supported through voluntary conservation measures through the Winona County Comprehensive Local Water Management Plan and the Root River Comprehensive Watershed Management Plan; and

WHEREAS, Minnesota Statutes Chapter 103F.48 requires a local water management authority that receives a summary of watercourses identified under this subdivision must incorporate an addendum to its comprehensive local water management plan or comprehensive watershed management plan to include the SWCD recommendations by July 1, 2018; and

WHEREAS, Minnesota Statutes Chapter 103F.48 does not require a plan amendment as long as a copy of the included information is distributed to all agencies, organizations, and individuals required to receive a copy of the plan changes.

NOW THEREFORE, BE IT RESOLVED that the summary of watercourses or "other waters" for Winona County shall be incorporated as an addendum in its current local water management plan and comprehensive watershed management plan; and

BE IT FURTHER RESOLVED that Winona County authorizes staff to provide a copy of the addendum and any supporting information to be distributed to all agencies, organizations, and individuals required to receive a copy of the plan changes.

Adopted at Winona, Minnesota, this 10th day of April, 2018.

WINONA COUNTY BOARD OF COMMISSIONERS

Marcia L. Ward
Board Chair

Attest:

Kenneth J. Fritz
County Administrator

Resolution # 06-14-2017

Adopting the Summary of "Other Watercourses" for the

Winona County Soil and Water Conservation District (SWCD)

WHEREAS; Minnesota statures 103F.48 requires SWCDs in consultation with local water management authorities, to develop, adopt and submit to each local water management authority within its boundary a summary of watercourses for inclusion in the local water management plan.

WHEREAS; The Board of Water and Soil Resources has adopted Buffer Law implementation *Policy 6: Local Water Resources Riparian Protection ("Other Watercourses")* which defines steps SWCDs are required to take in developing said inventory.

WHEREAS; Winona Co SWCD has consulted with Winona County Water Planner and Planning Department staff and considered watershed data, water quality and land use information.

WHEREAS; Winona Co SWCD, Winona County Water Planner and Planning Department staff have assessed the water quality benefits that buffers and alternative practices would provide to local water resources that were not included on the Buffer Protection Map.

WHEREAS; Winona Co SWCD has prepared a rationale for inclusion or exclusion of waters that were not included on the Buffer Protection Map.

THEREFORE, BE IT RESOLVED that the "Other Watercourses" submitted by Winona County SWCD be the Decorah Edge influenced streams as noted on the attachment entitled; *Winona County SWCD Buffer Law "Other Watercourses"* dated 05-2017.

Ayes: 4 **Nays:** 0

Certified by Winona Co SWCD Chair: Leo Speltz

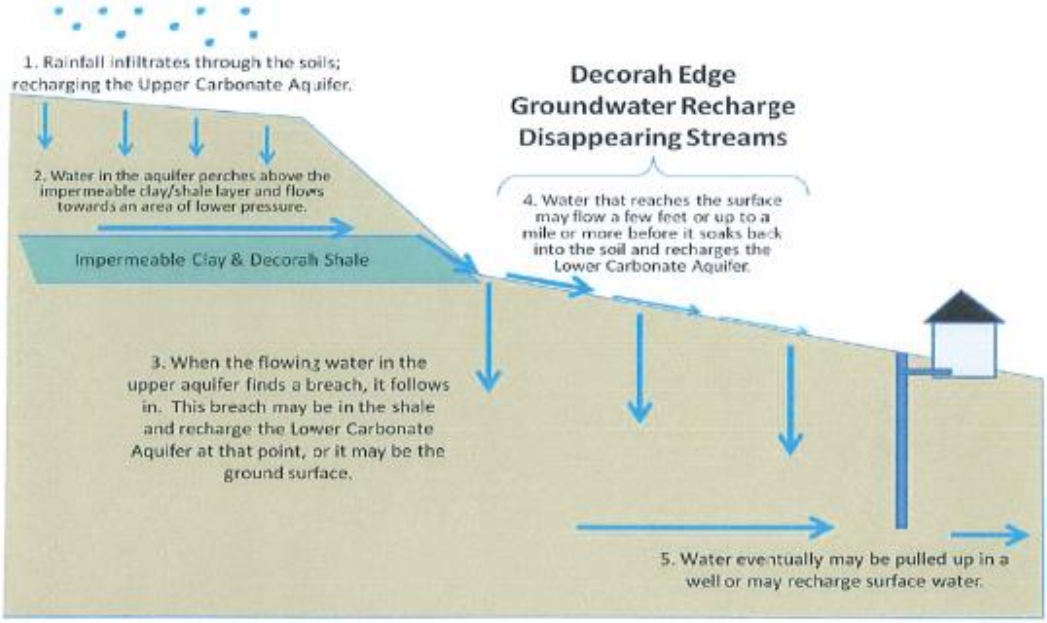
Leo Speltz

Date Adopted: June 14, 2017

Winona County SWCD Buffer Law "Other Watercourses"

Decorah Edge Influenced – Disappearing Streams

- Water Quality Concerns
  - Streams flowing from the Decorah Edge and soaking back into the ground; recharging groundwater
  - These waters often flow through pasture or cropland as they soak back into the ground
  - These streams may flow a few feet or up to a mile or more before recharging the groundwater
  - This groundwater may be pulled up in a well or may recharge surface water within a few miles

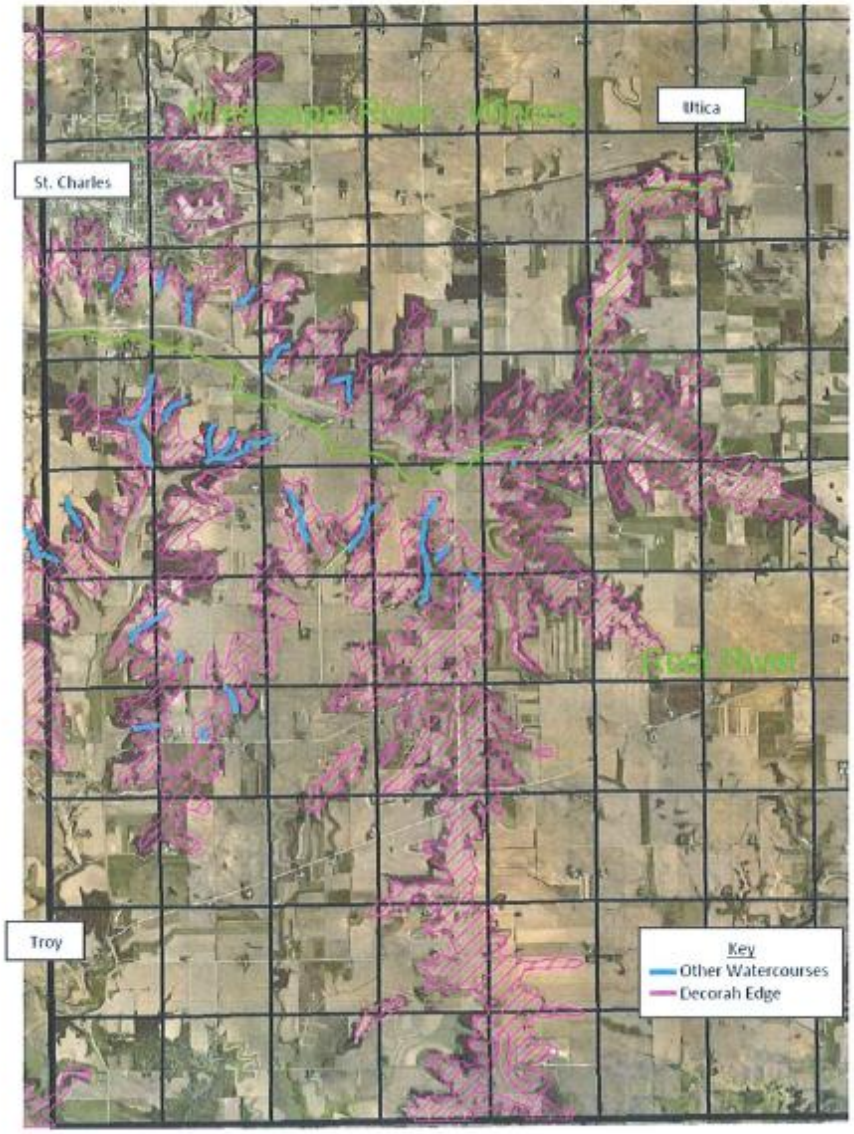


Local Ordinances/Water Plans

- Winona County Comprehensive Local Water Mgmt. Plan
  - Priority Concerns: Water Quality
    - Goal: Buffer all Sensitive Water/Land Interfaces
- Root River One Watershed One Plan
  (Root River Comprehensive Watershed Mgmt. Plan)
  - Surficial-subsurface Hydrologic Connections
- Other Existing Ordinances/Local Regulations in the area
  - Fillmore Co. Decorah Shale Overlay District
  - Olmsted Co. Decorah Edge Overlay District

Location:

- Mississippi River-Winona and Root River Watersheds
- Areas of Winona County include a portion of the Townships of:
  - St. Charles
  - Saratoga
  - Utica
  - Fremont
- This map shows potential locations but is not exact, nor is it all inclusive
- Field verification is needed on all potential sites if regulations are considered



* Most of these streams are currently buffered, but should be on the radar for potential water quality concerns in the future.

** Identification of a watercourse on this map does NOT make it subject to the regulatory requirements of the State Buffer Law.

Winona Co. SWCD 05-2017

May 2008 NRCS Assessment Report Summary

The Natural Resource Conservation Service (NRCS) 2008 Assessment Report included the following options for protection of the City of Stockton: no action, land treatment measures, buyout, dike and channel excavation (USACE 1994 Plan), diversion, large floodwater retention structures, and upland ponds with a 100-year floodwater runoff storage capacity. A brief summary of each of these options presented in the NRCS assessment in included here. For a more complete analysis of all of the options listed please refer to the complete NRCS Assessment Report.

No Action

A no action plan or maintaining the status quo would not reduce the flood damages in the future as existing problems would remain.

Land Treatment Measures

No land treatment measures were researched. The amount of protection required for the City of Stockton or Minnesota City would not be achieved by land treatment measures.

Stockton City Buyout

The only nonstructural flood damage reduction alternative considered for the City of Stockton was a buyout of all residential and commercial properties. This alternative would provide complete flood protection for all future storm events. This option was considered to be economically infeasible although pending buyouts and flood mitigation that occurred following the 2007 flood were not taken into account and could have made this option more practical. Additionally, the report states that a mix of buyouts and flood reduction measures may lower the cost of further making this alternative feasible.

USACE 1994 Plan

The main feature of the 1994 US Army Corps of Engineers (USACE) Plan involved in-stream excavation to create more volume capacity within the river, rip rap, and the construction of a dike. The NRCS indicates the cost benefit may make this plan feasible and recommended further study of this option.

Stockton Diversion

This alternative proposes a floodwater diversion structure around the City of Stockton. Whether the long or short diversion is installed, a reduced version of the USACE 1994 plan would still need to be constructed to provide Stockton the level of protection desired. With either diversion installed, the dike heights proposed in the USACE Plan could be lowered by approximately 3 feet. While reducing the amount of floodplain excavation required. This option was determined to be economically infeasible.

Large Floodwater Retention Structures

A hydrology model estimated the effects of potential floodwater retention structures upstream of Stockton. It was determined that building the retention structures alone would not provide protection to the 100-year flood level; therefore, additional damage reduction measures would need to be constructed around the city. For this analysis, the additional measures were assumed to be the same components as the 1994 USACE plan (dikes + floodplain modification) however their size would be reduced due to the reduced discharges provided by the retention structures. The study found that although the structures do provide flood protection benefits, they are not economically feasible.

Upland Ponds (with 100-year level runoff storage capacity)

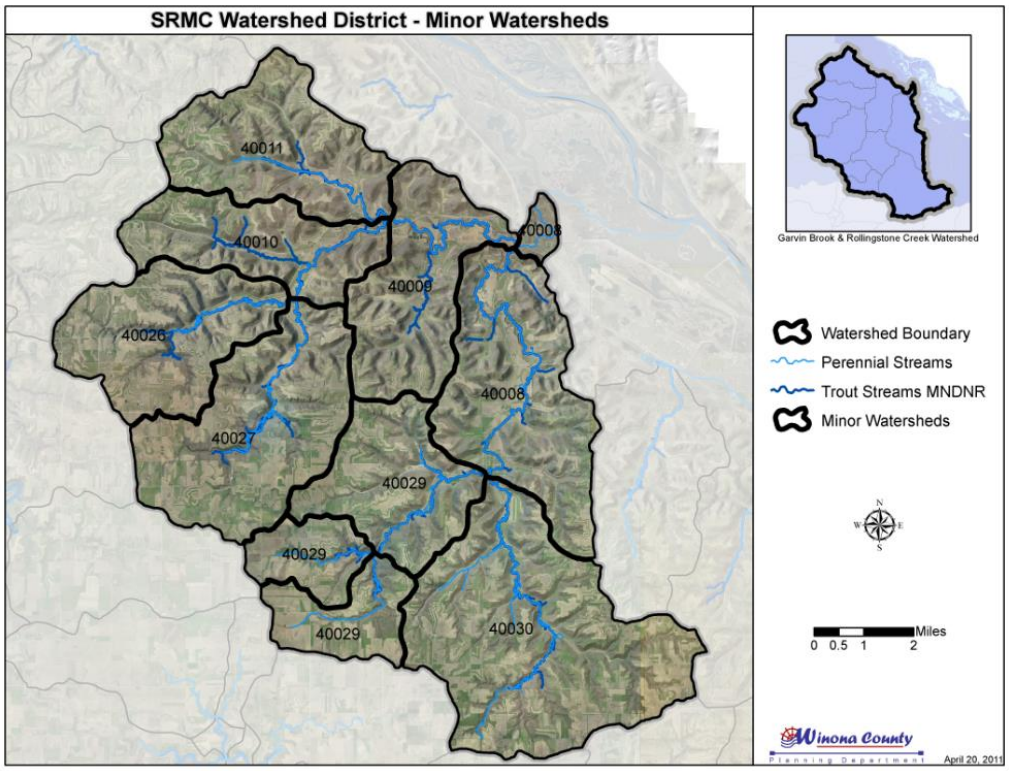
This alternative investigated the feasibility of installing several small “pond-sized” floodwater retention structures upstream of Stockton. In addition to the upland ponds, dikes around Stockton would be needed to provide the desired level of flood damage reduction. The upland floodwater storage pond alternative considered revealed that it could in fact reduce peak flows in Stockton during events up to the 100-year event. However, after completing a limited economic analysis, this alternative was removed from further consideration.

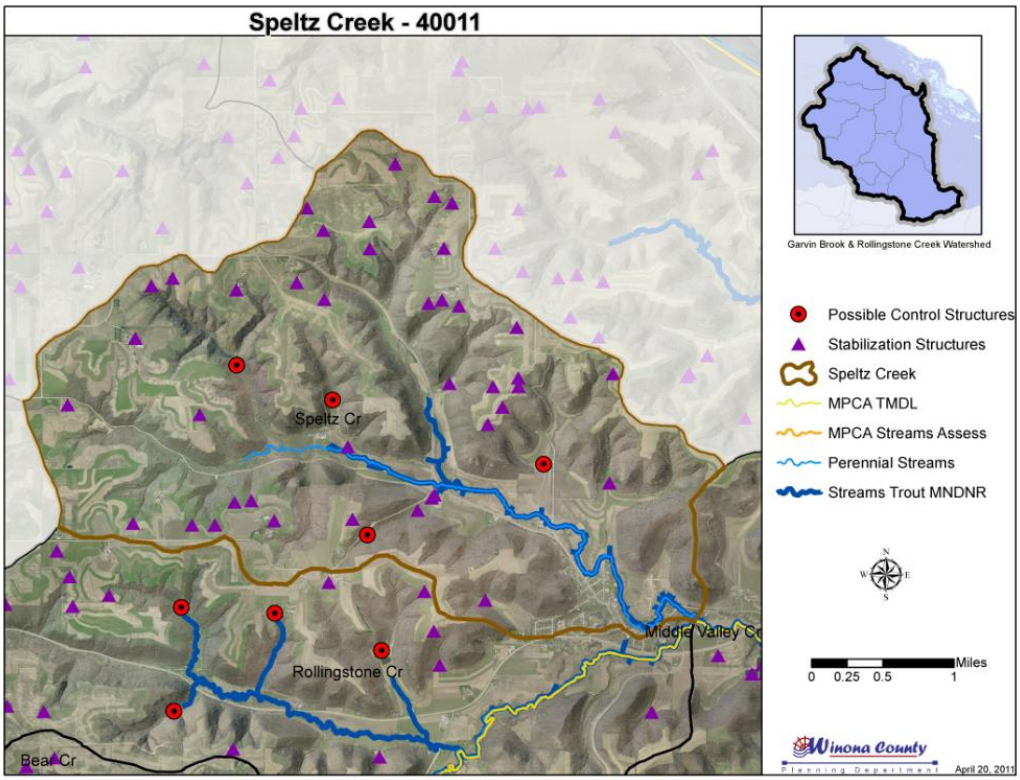
Conclusion

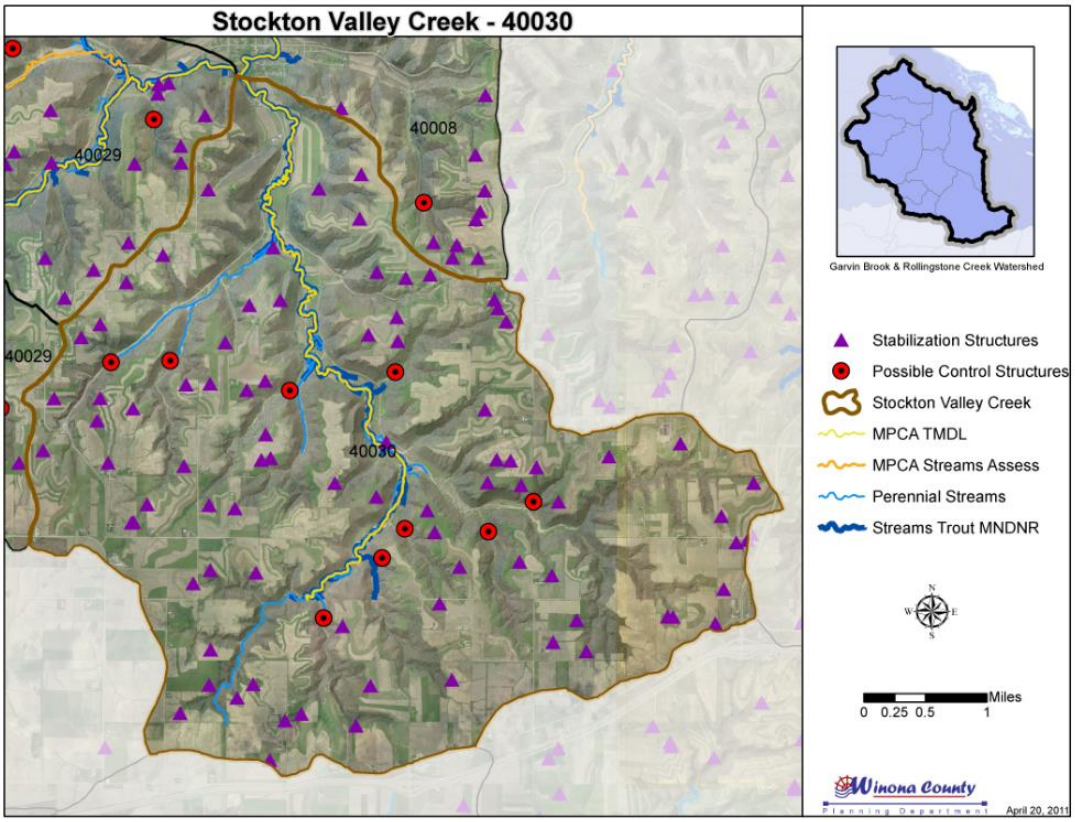
The NRCS Assessment concluded with the following statement concerning the options evaluated:

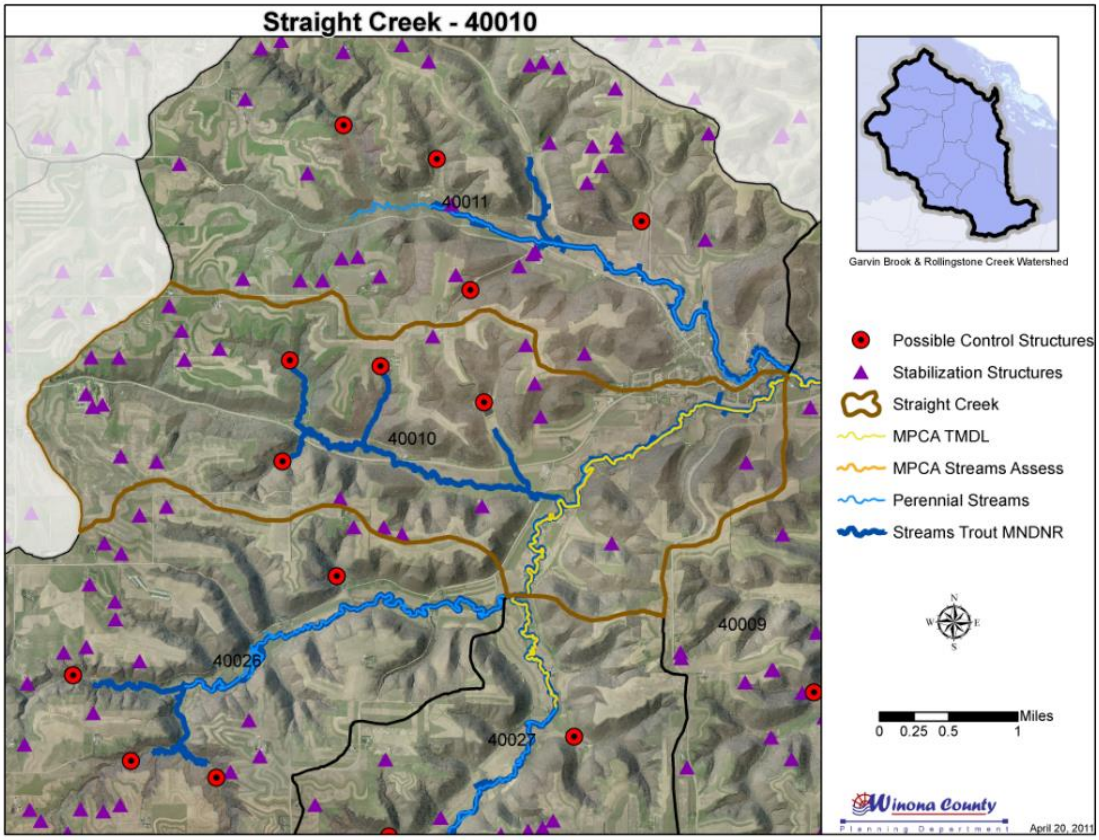
> Based upon the results of this assessment, the updated version of the USACE 1994 plan (Stockton-Dike and floodplain excavation) has the potential to be a feasible alternative to reduce the risk of flooding in City of Stockton. Additionally, the construction of a dike around the Gunderson Addition has the potential to provide economically feasible flood damage reduction. Based on this assessment, additional data would need to be collected to verify the feasibility, address environmental concerns, and obtain public input for the plans recommended for detailed study. Changes to any of these issues may affect the alternatives overall ratings.

Maps Depicting Structures for Minor Watersheds:






Stockton Valley Creek - 40030
40008
40029
40029
40030
Garvin Brook & Rollingstone Creek Watershed
Stabilization Structures
Possible Control Structures
Stockton Valley Creek
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 20, 2011


Straight Creek - 40010
40011
40010
40009
40026
40027
Garvin Brook & Rollingstone Creek Watershed
Possible Control Structures
Stabilization Structures
Straight Creek
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
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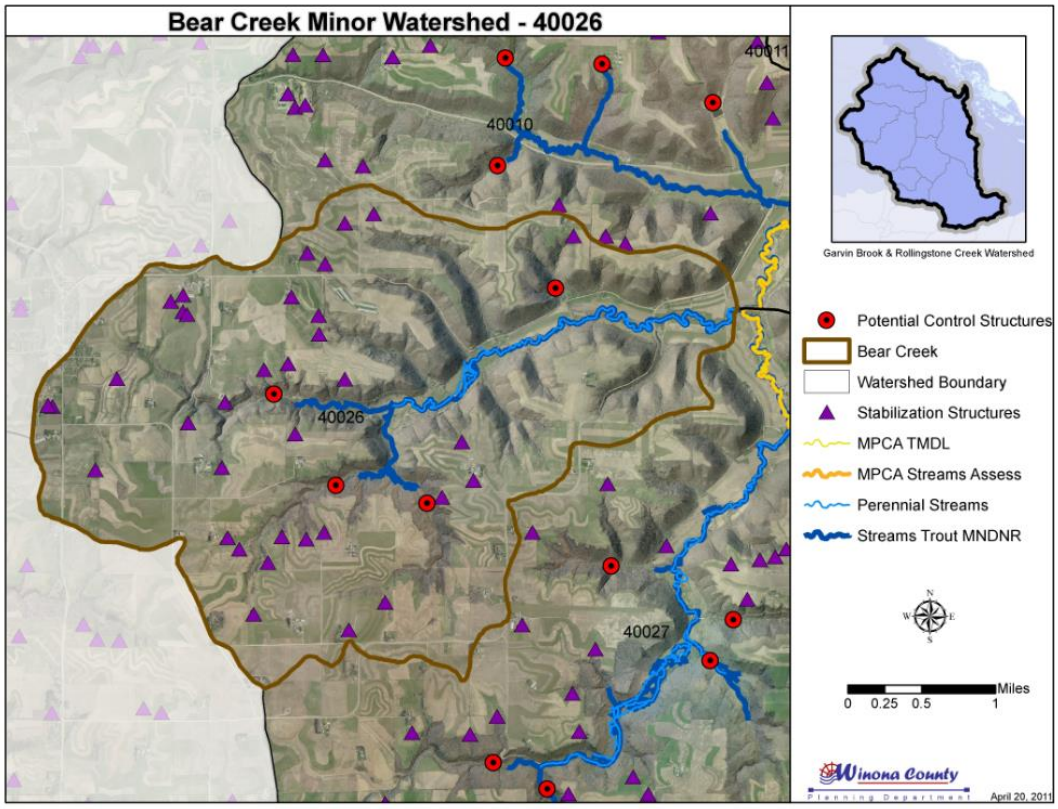
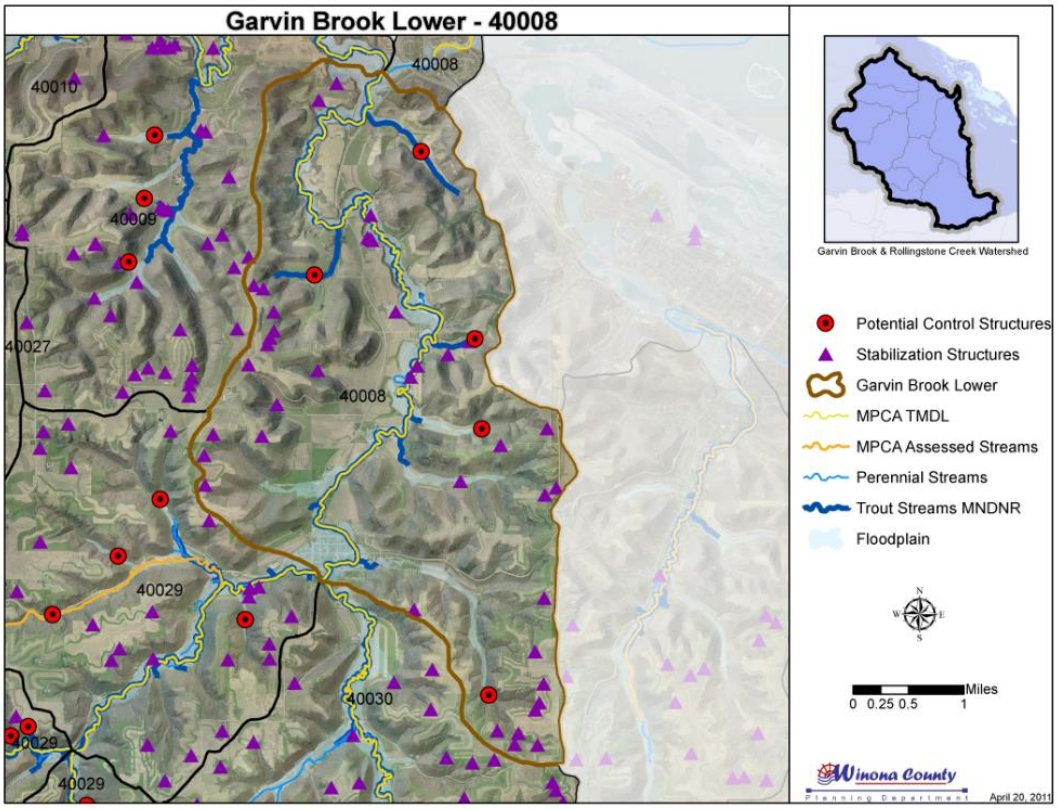
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 20, 2011


Bear Creek Minor Watershed - 40026
40011
40010
40026
40027
Garvin Brook & Rollingstone Creek Watershed
Potential Control Structures
Bear Creek
Watershed Boundary
Stabilization Structures
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 20, 2011


Garvin Brook Lower - 40008
40008
40010
40009
40027
40008
40029
40030
40029
40029
Garvin Brook & Rollingstone Creek Watershed
Potential Control Structures
Stabilization Structures
Garvin Brook Lower
MPCA TMDL
MPCA Assessed Streams
Perennial Streams
Trout Streams MNDNR
Floodplain
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Miles
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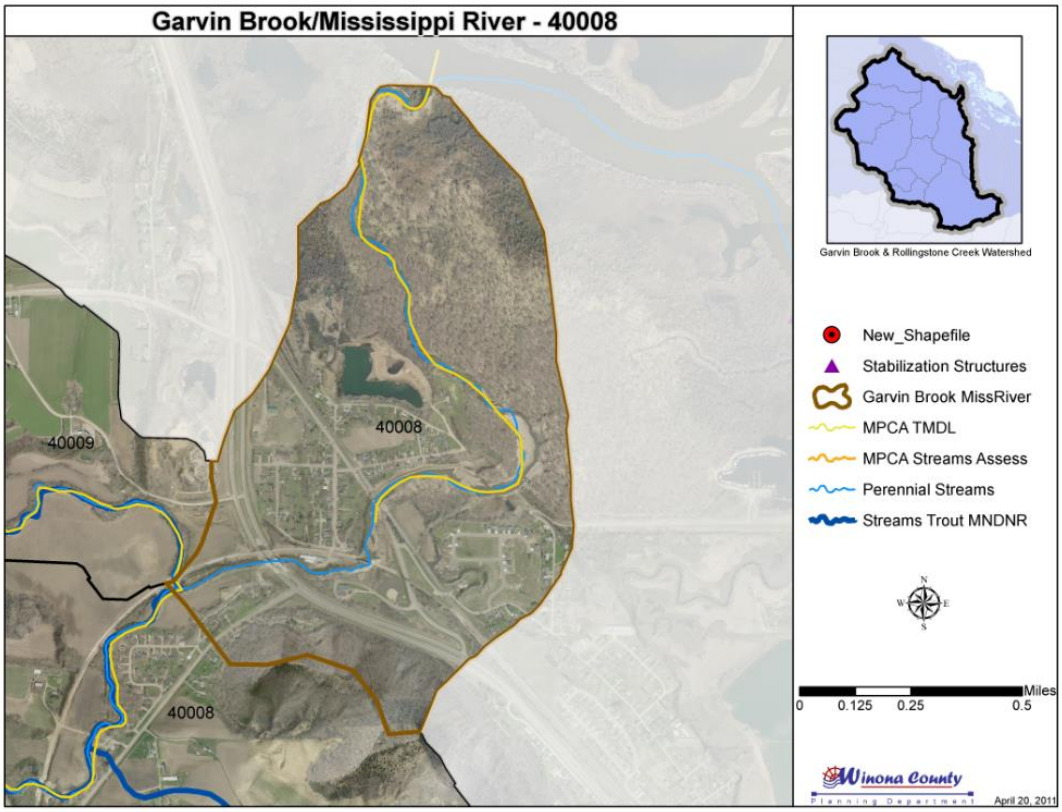
Winona County
Planning Department
April 20, 2011


Garvin Brook/Mississippi River - 40008
40009
40008
40008
Garvin Brook & Rollingstone Creek Watershed
New_Shapefile
Stabilization Structures
Garvin Brook MissRiver
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
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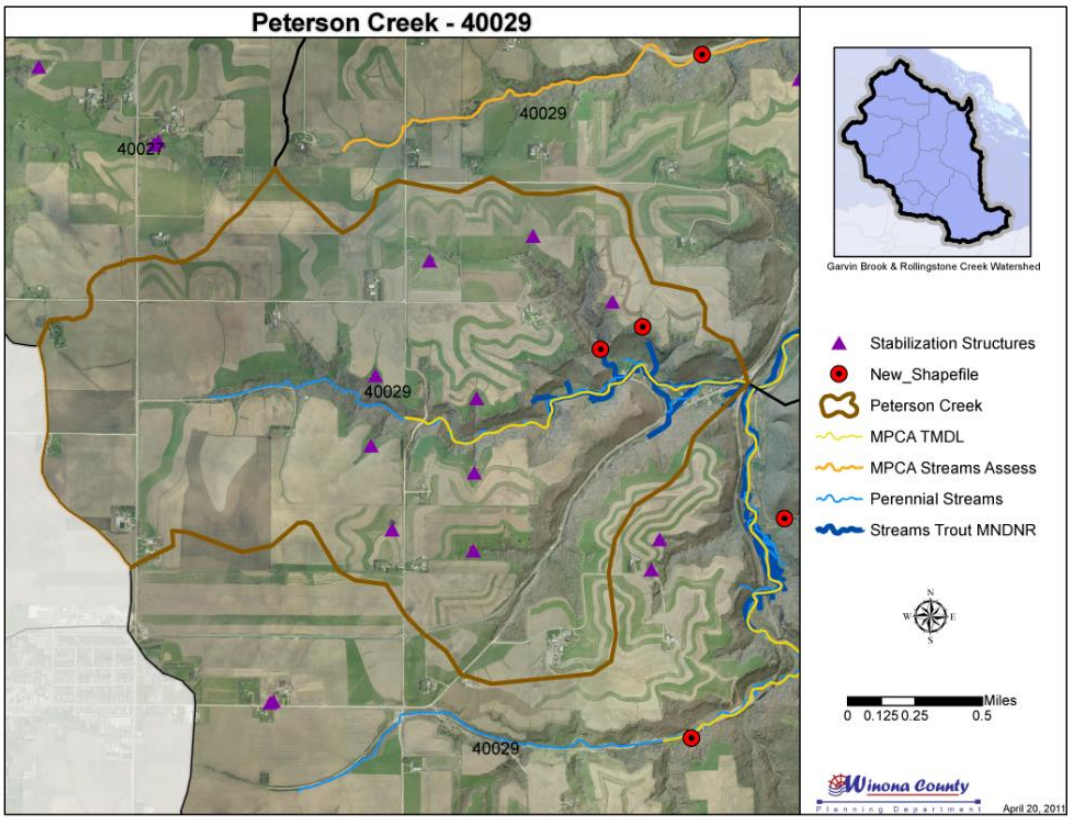
Winona County
Planning Department
April 20, 2011


Peterson Creek - 40029
40029
40027
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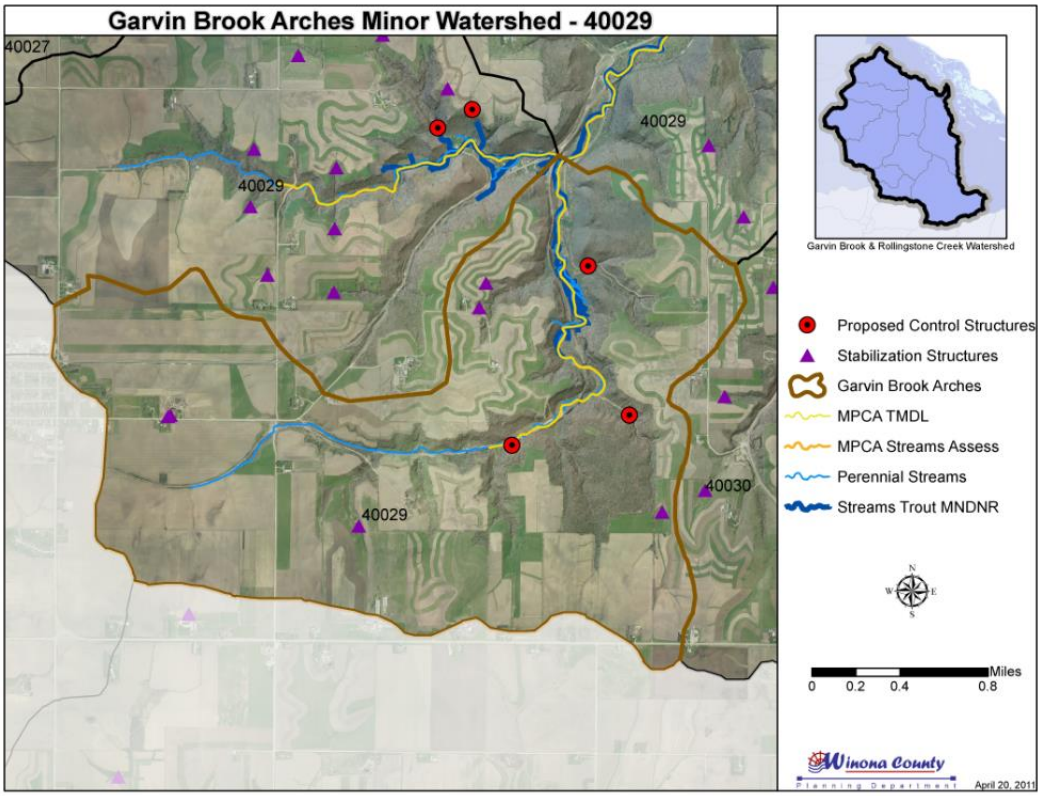
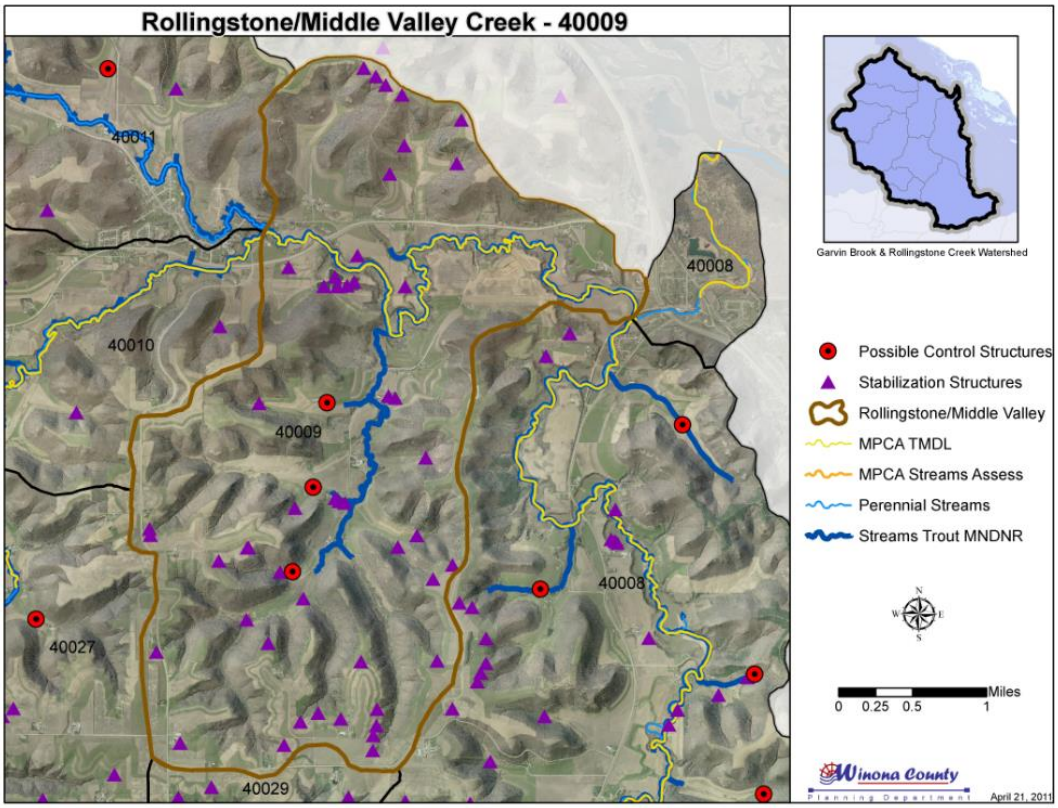
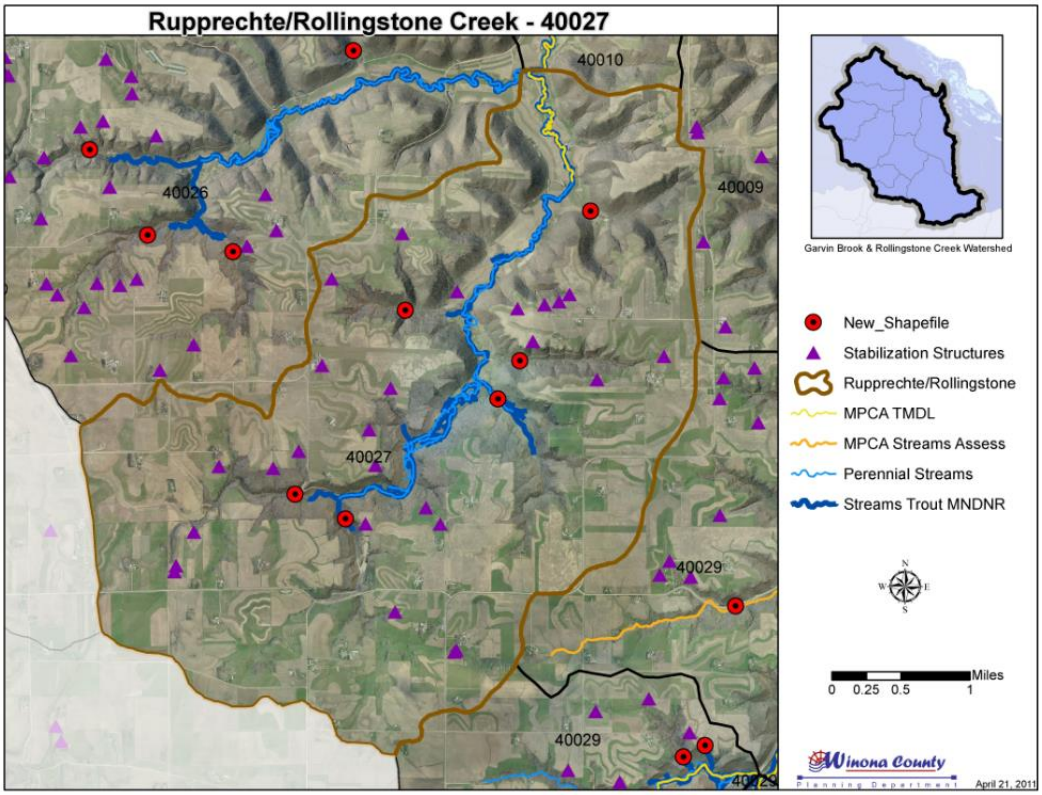
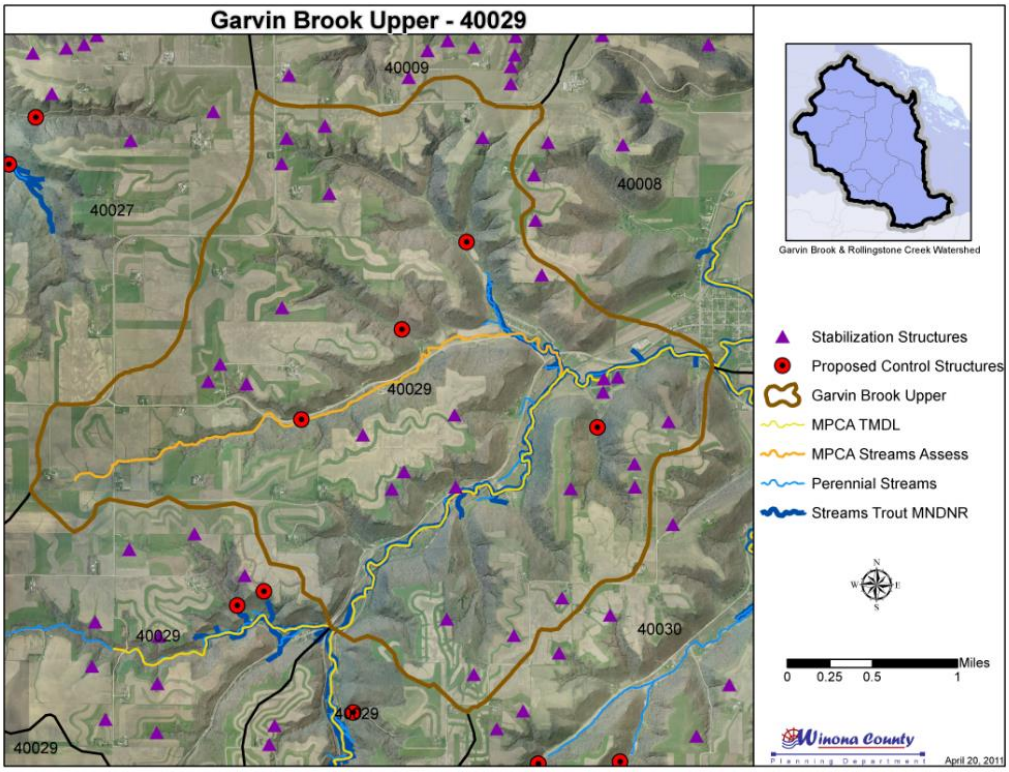
40029
Garvin Brook & Rollingstone Creek Watershed
Stabilization Structures
New_Shapefile
Peterson Creek
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.125 0.25 0.5
Winona County
Planning Department
April 20, 2011


Garvin Brook Arches Minor Watershed - 40029
40027
40029
40029
40029
40030
Garvin Brook & Rollingstone Creek Watershed
Proposed Control Structures
Stabilization Structures
Garvin Brook Arches
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.2 0.4 0.8
Winona County
Planning Department
April 20, 2011


Rollingstone/Middle Valley Creek - 40009
40011
40010
40009
40008
40008
40027
40029
Garvin Brook & Rollingstone Creek Watershed
Possible Control Structures
Stabilization Structures
Rollingstone/Middle Valley
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 21, 2011


Rupprechte/Rollingstone Creek - 40027
40010
40026
40009
40027
40029
40029
Garvin Brook & Rollingstone Creek Watershed
New_Shapefile
Stabilization Structures
Rupprechte/Rollingstone
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 21, 2011


Garvin Brook Upper - 40029
40009
40008
40027
40029
40029
40030
40029
40029
Garvin Brook & Rollingstone Creek Watershed
Stabilization Structures
Proposed Control Structures
Garvin Brook Upper
MPCA TMDL
MPCA Streams Assess
Perennial Streams
Streams Trout MNDNR
N
W
E
S
Miles
0 0.25 0.5 1
Winona County
Planning Department
April 20, 2011