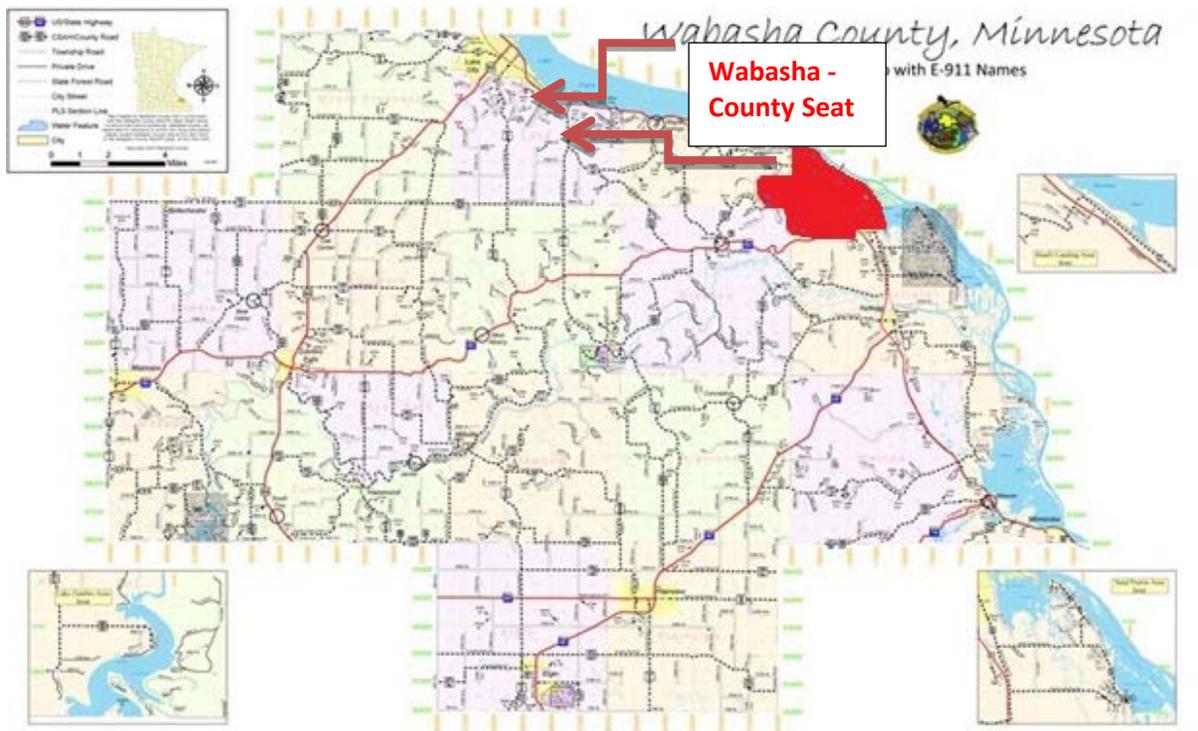




Comprehensive Local Water Plan

2015-2025 (with 2020 update)





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Executive Summary

Profile

Wabasha County is located in the southeastern portion of Minnesota (see below map). It is bordered by the Mississippi River to the east with bordering counties including; Goodhue County to the north and west, Olmsted county to the south and southwest, and Winona County to the southeast. Wabasha County has a total land area of 351, 891 acres (550 square miles). Seventeen townships or parts of townships are contained within Wabasha County, along with 11 cities. The City of Wabasha, the county seat, lies approximately 30 miles northwest of the City of Winona, 35 miles north of the City of Rochester and 70 miles southeast of Minneapolis/St. Paul.

According to the Minnesota Census of the Land information, Wabasha County's dominant land use is cultivated land (53.7%), followed by deciduous forest (25.3%) and grasslands (13.1%). Over the past years there has been a decrease in the size of feedlots, not only by animal units, but by how many exist in Wabasha County. Due to the loss of feedlots, there were not as many animals to feed, which caused a decrease in permanent vegetation or hay, wheat, alfalfa, which caused an increase in cash, row crops, such as corn and beans. A slight loss of deciduous forest has been occurring and may have a slight decrease in the same percentage over the next five years, due to commodity prices. It is unlikely Wabasha County will experience any significant changes in the next five years.

Population and Population Trends

The population of Wabasha County at the 2010 census was 21,676, according to information provided by Rochester, MN Metropolitan Statistical Area. The average population growth over the last ten years was 66 people or a 0.3% increase. The Minnesota Demographic Center estimates there may be a 0%-5% increase in population between now and 2040, which is not a significant increase.

Water Resources Profile

Due to the geology contained in Wabasha County there is an abundance of Karst features found throughout the county. Karst features include sinkholes, springs, caves, disappearing streams, and blind valleys. These karst features can be direct corridors between the surface and ground water. The direct link between surface and ground water makes the county's ground water more susceptible to contamination from surface water pollution. This makes the protection of surface water a higher priority in Wabasha County since it can be a direct threat to human health.

Background of Comprehensive Local Water Management Plan

Resolution

The Wabasha County Board of Commissioners designated the Wabasha County Soil & Water Conservation District as the Local Unit of Government responsible for the management of the Comprehensive Local Water Management Plan. The Wabasha County water planning process started when the Board of Commissioners passed a resolution on March 27th, 2012 to enter into the Comprehensive Local Water Planning (CLWP) process under chapter 103B.311 and 103B.315. On June 28, 2012 Wabasha County Board of Commissioners approved a resolution requesting an extension. On August 21, 2012, the Southern Region Water Planning Committee approved the extension with a December 31, 2014 deadline for completion of the Comprehensive Local Water Plan. The original Comprehensive Local Water Management Plan was adopted July 2, 1990 and was updated in 1995. The second plan was adopted on December 19, 2007 and was effective through the expiration date was December 31, 2014.

Purpose of the Comprehensive Local Water Management Plan

The purpose of the comprehensive local water management plan is to address potential and existing water resource related issues and establish goals to protect, enhance, and manage water resources for Wabasha County. Citizens of Wabasha County heavily rely on its water resources for drinking, recreation, and production. It is important that the county take a proactive approach to protect these resources by addressing priority concerns identified by citizens, agencies and the task force committee. The water management plan will provide a framework and guideline for implementing action to address the identified priority concerns, goals and objectives.

It is written in Minnesota Statute 103B.301 to 103B.355 that a local water management plan must be written and also states several requirements that need to be included:

1. The plan must cover the entire county.
2. The plan must address problems in the context of watershed units and groundwater systems.
3. The plan must be based upon principals of sound hydrologic management of water, effective environmental protections, and efficient resource management.
4. The plan must be consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or ground water systems.
5. The final requirement speaks to the duration of the plan (5 or 10 years) and the use of other plans when preparing the local water management plan.

Summary of Priority Concerns

The following priority concerns were identified through reviewing task force surveys that had been sent out and received with varying degrees of concerns listed, including citizen input through interviews, survey input, and follow up with any questions about their data, responses from other local units of government through surveys, follow up calls, and interviews, and from recommendations from state agencies and local and regional associations through surveys and networking. Grouping the data helped to create the top priority concerns for this water plan. The 2008-2012 Wabasha County Comprehensive Water Plan listed the top 5 priority concerns as soil

erosion, nutrient and manure management, SSTS/ground water protection, forest and pastureland, and impaired waters. The 2012-2022 Wabasha County Comprehensive Water Plan indicates the following priorities in no particular order:

OLD PRIORITIES

- 1) Soil Erosion
- 2) Nutrient and Manure Management
- 3) SSTS/Groundwater Protection
- 4) Forest and Pastureland
- 5) Impaired Waters

NEW PRIORITIES

- 1) Soil Erosion
- 2) Nutrient and Manure Management
- 3) SSTS/Wells/Groundwater
- 4) Forest and Pastureland
- 5) Watershed Management Approach
- 6) Urban Issues

The priority concern, called impaired waters in the 2008-2012 Comprehensive Water Plan, was eliminated in this priority concerns scoping document. After reviewing the feedback that was received it was necessary to broaden the old priority into watershed management approach and urban issues. The subject matter has become a larger issue in the last 5 years, thus the need for an expanded view and different approach to dealing with impaired waters. There was a need to eliminate the priority of impaired waters, and add the two priorities of watershed management approach, and urban issues, which addresses everything involving impaired waters, just at a narrower scope. Each of the new priority concerns will address different issues that include impaired waters from different sources.

Each of the listed concerns is broken down with a summary of the individual feedback, listed next. Following the summary listings, the individual feedback is also included. Fortunately, all of the feedback was contained within one, or more of the priority concerns.

Soil Erosion -

- Enforce Row Crop setbacks–Minnesota Department of Natural Resources
- Upland treatment to slow erosion from fields – Trout Unlimited
- Erosion and sediment control through retention ponds, waterways, terracing – Trout Unlimited
- Working through soil health to increase infiltration to reduce runoff and erosion -
- Implementation of cover crops– Whitewater Watershed Project
- Installation and maintenance of waterways – Whitewater Watershed Project
- Education on and compliance with existing rules and regulations such as shoreland and sensitive features buffers – Whitewater Watershed Project
- Implementation of no till practices–
- Reduce upland runoff and restoring floodplain connectivity – The Nature Conservancy
- Include buffers, natural floodplains, and areas of perennial vegetation – The Nature Conservancy
- Improved nutrient management – the Nature Conservancy
- Improve crop rotations – the Nature Conservancy

- Add more residue – The Nature Conservancy
- Use more reduced tillage – The Nature Conservancy

Nutrient and Manure Management

- Nutrient runoff from farmland after fertilizer, herbicides, and pesticides applications– Wabasha County Farmers Union
- Nutrient runoff from farmland after manure applications -
- Overuse of both fertilizer and manure applications -
- Implementing livestock, feedlot, and manure management -
- Runoff from city lawns, gardens, and infrastructure– Wabasha County Farmers Union
- Education on nutrient and manure management – Whitewater Watershed Project

SSTS/Wells/Ground Water

- Unused, Unsealed wells – Minnesota Department of Health
- Wellhead protection of public water supplies - Minnesota Department of Health
- Water quality of private wells – Minnesota Department of Health
- Address failing septic systems – Whitewater Watershed Project
- Septic systems needing repair
- Communities in need of proper community sewer systems (Theilman, Weaver, and Minneiska) – Minnesota Pollution Control Agency

Forest & Pasture Land

- Implementation of rotational grazing
- Properly managing forest land
- Protecting environmental buffers
- Control of invasive species
- Promote Grazing – Whitewater Watershed Project

Watershed Management Approach

- Watershed restoration and protection approach
- Targeting BMP's to align local plans while engaging ag partners (civic engagement)
- Work with upstream counties to control runoff and slow the flow – Wabasha County Farmers Union
- Ag drainage, wetlands and water retention
- Protecting, maintaining, and expanding priority natural areas for watershed health – The Nature Conservancy

- Increased use of BMP's, increased use of NRCS and SWCD programs – Whitewater Watershed Project

Urban Issues

- Runoff filtration issues with stormwater drainage
- Sedimentation and nutrient delivery to streams from lawns and infrastructure without filtering
- Use of chemicals within city parks
- Lack of shoreland buffers in urban settings
- Educational needs on water quality issues and karst geology – Whitewater Watershed Project

Assessment of Priority Concerns

Soil Erosion

(text in this section largely taken from Minnesota Department of Ag website <http://www.mda.state.mn.us/en/protecting/conservation/practices.aspx>)

Soil erosion results from topsoil loss that occurs more quickly than soil formation processes that can replace it; this process is continual due to natural causes and accelerated by animal and human activities. These factors added to the rolling to steep topography of Wabasha County can cause soil erosion rates well above the tolerable soil loss amount (T), T being 2 to 5 tons per acre/per year, depending on soil type.

Land management practices such as changes in traditional crop rotations, residue management and tillage practices have led to an increase in soil erosion. The decline in livestock farming has caused permanent vegetative crops such as hay and pasture to be converted to row crop production, especially corn and soybeans.

There are many “best management practices” (BMP's) available to help decrease soil erosion throughout Wabasha County. BMP's for agricultural land include; contour farming, buffers, no-till farming, cover crops, grassed waterways, terraces, rotational grazing, soil health, etc. These practices help to stabilize soil, which in turn will help prevent or reduce soil erosion. Some of these practices are described in the following:

Gully or Grade Stabilizations – “an embankment or spillway built across a drainageway to prevent soil erosion. Grade stabilization structures are especially important in areas of Minnesota where sediment loading from gully erosion is a major water quality concern...”
(<http://www.mda.state.mn.us/protecting/conservation/practices/gradestab.aspx>)

Gullies tend to advance upslope at overfalls (small, concentrated waterfalls) below which turbulent water undercuts the head of the gully & dash; a process called head-cutting. Grade stabilization

structures control the way water falls to lower elevations, preventing gullies from forming or advancing.

There are many types of grade stabilization structures. Some are full-flow, allowing water to flow freely over a spillway. Others look like a pond and are designed to detain water behind an embankment. Grade stabilization structures are also used to stabilize erosion-prone sites where a tributary or tile drainage outlet enters a channel such as a ditch from the side; the grade stabilization structure slows the flow of water from the higher elevation of the tributary or side-inlet (where water is entering) to the lower elevation of the channel.

Why install grade stabilization structures?

Environmental benefits

- Reduces soil erosion by preventing gullies from forming or advancing at field/ravine edges and other overfalls where concentrated water flow causes head-cutting
- Reduces peak stormwater flows
- Protects water quality by reducing sediment loading in rivers, streams, ditches, lakes and wetlands
- Reduces sediment loading protects fish and other aquatic habitat
- Structures with water storage provide a source of water for wildlife

Practical benefits

- Prevents productive topsoil from being carried away by gully erosion
- Prevents gullies from eating away at fields, making them difficult to farm
- Minimizes expensive gully repairs
- Prevents siltation of cropland, roadways and other property



The above photos show a grade stabilization structure and a stable outlet for controlled timed release of water flow.

Grass Waterways – “Grass waterways are a type of conservation buffer; they downhill grassed channels, generally broad and shallow, designed to prevent soil erosion while draining runoff water from adjacent cropland. As water travels down the waterway, the grass vegetation prevents erosion that would otherwise result from concentrated flows. Grass waterways also help prevent gully erosion in areas of concentrated flow
(<http://www.mda.state.mn.us/en/protecting/conservation/practices/waterway.aspx>).”



The above represents a well-functioning waterway. This photo was taken during the flooding period on September 23, 2010.

Contour Farming / Stripcropping - “Contour farming is growing crops "on the level" across or perpendicular to a slope rather than up and down the slope. The rows running across the slope are designed to be as level as possible to facilitate tillage and planting operations on the contour (<http://www.mda.state.mn.us/en/protecting/conservation/practices/contourfarm.aspx>).”

‘Stripcropping is growing strips of row crops such as corn and soybeans alternate in a planned rotation with equal-width strips of close-growing crops such as forages, small grains or sod, all arranged systematically across a field. (<http://www.mda.state.mn.us/en/protecting/conservation/practices/contourstrip.aspx>).’

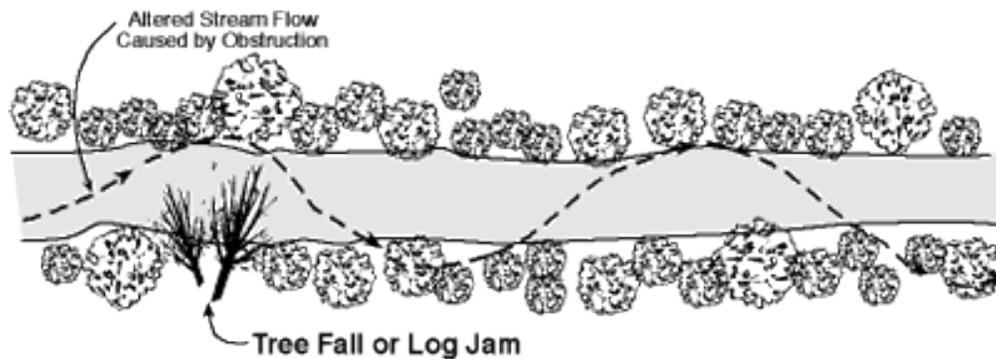


Contour stripcropping including hay in rotation is highly beneficial for erosion reduction on the steep slopes of Wabasha County.

Streambank Stabilization and Lakeshore Protection - “Streambank stabilization and protection involves using vegetation or materials such as riprap or gabions to stabilize stream, river or ditch banks or lake or reservoir shores, protecting them from erosion or sloughing. It also includes removing snags or debris from banks and channels to improve stream flow and minimize bank erosion caused by high-velocity water flowing around the obstructions (<http://www.mda.state.mn.us/protecting/conservation/practices/streambank.aspx>).”

Sediment loading is a major water quality concern in Minnesota, and streambank erosion is a significant source of sediment in some Minnesota landscapes. Streambank and lakeshore protection is especially important for restoring and protecting surface water quality in these landscapes.

Riparian Corridor With New Obstruction



Riparian Corridor After Obstruction

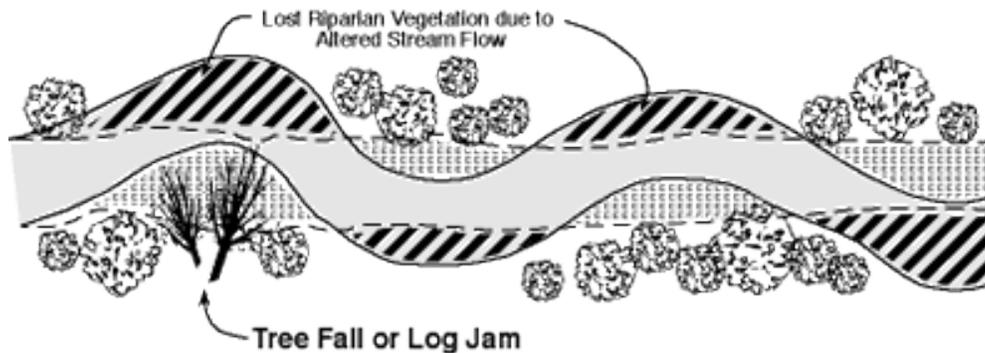


Diagram showing how obstructions (fallen trees, logs or other debris) can alter a stream's course and cause bank erosion. Image courtesy of Ohio DNR

Why protect streambanks and lakeshores?

- Stabilizes banks and shores, preventing further erosion and degradation
- Improves water quality by reducing sediment loads in surface waters
- Helps maintain the capacity of waterways to handle floodwaters, preventing flood damage to utilities, roads, buildings and other facilities
- May aid compliance with Minnesota drainage laws and shoreland regulations
- May avoid or lower landowner or government expenses for dredging sediment from lakes and drainage ditches
- Enhances habitat for fish and other aquatic species by improving water quality and moderating water temperature
- Creates cover for wildlife if vegetation is used
- Beautifies banks and shorelines

In 2013 stream bank stabilization on the Zumbro River in Kellogg was completed to mitigate the effects of the 2010 flood. Initially 800-900 feet was installed to protect homes in immediate danger. A second phase of funding allowed the stabilization to be extended to the majority of the river bend ensuring a lasting installation. This was highlighted in BWSR's publication March 2014 Snapshots (<http://www.bwsr.state.mn.us/news/webnews/march2014/4.pdf>).



This picture shows completion of Phase II of that project.

Several projects were completed in 2013 under the Phase I grant. Those included another stream bank and shoreline protection project, a grade stabilization structure and grassed waterways.



Picture above is a Phase I stream bank stabilization / shoreland project

Nutrient and Manure Management

The September 2014 Minnesota Nutrient Reduction Strategy identifies various sources of nitrogen loading and strategies for reducing those loads for each point and non-point source.

Many of the sources are considered throughout the priorities identified in this document. Practices that reduce erosion would be beneficial to also reducing nutrient loading. Nutrients attach to soil particles; if more soil is secured the nutrients attached would be as well. Urban sources are discussed in the Urban Issues Priority Concern section. Woodland and vegetative practices are recommended in the Forest and Pasture Land sections. The Minnesota Nutrient Reduction Strategy September 2014 with contributions from multiple stakeholders will be used as an overall guide to strategizing goals and implementation plans for nutrient and manure management. Nutrients can be particularly hazardous to groundwater quality due to the presence of this soils over bedrock in much of Wabasha County.

At the onset of writing of this plan Wabasha County housed a feedlot officer who administered the County Feedlot Program through a cooperative arrangement between the MPCA and County government. In August of 2014 Wabasha County “undelegated” their feedlot regulatory authority and returned those responsibilities to the State.

The Wabasha SWCD, at the time of plan writing, houses an Area Feedlot Technician who has capability to work in the 11 southeast Minnesota counties in Area 7. The technician, along with other District and federal staff provide technical and financial assistance options for nutrient and manure management.

Livestock production comprises much of Wabasha County agriculture. The County was ranked 9th in the State for cattle and calves inventory. Cattle and calve inventory was 68,630, hogs and pigs inventory estimates were 8,851, 2,655 layers, and 1,109 sheep and lambs.
http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Minnesota/

2015 INFORMATION PROVIDED BY MPCA REGARDING REGISTERED FEEDLOTS IN WABASHA COUNTY	
Feedlot Amount	Number
Number of feedlots registered in Shoreland with 10-299 AU	66
Number of feedlots registered outside Shoreland with 50-299 AU	66
Number of NON-NPDES sites greater than/equal to 300 AU	32
Number of feedlots registered with NPDES permits	5
Total	527
Number of sites with 10 AU or more in Shoreland	70
Number of sites with 10 AU or more that are both in shoreland and in a Drinking Water Supply Management Area (DWSMA)	1

Assistance to landowners to evaluate feedlots is offered. FLEVAL and MinnFarm are model tools that take a “fixing” approach to feedlot compliance. These tools can predict phosphorous runoff concentrations at the feedlot discharge point. It can also be used to determine other

pollutants. It produces options that are mostly low cost such as roof gutters, limit animal units, increase actual feedlot size, create buffer strips, setbacks, fencing, proper lot management etc. These options can provide effective alternatives to landowners if they maintain them as recommended.



The first photo above shows a before feedlot “fix” picture. The 2 photos beneath show the results of the “fix.” This project was cost share through “319 Funding”, federal dollars obtained by the SE Water Resource Board and allocated to Counties.

The Local Water Management Task Force recognizes a need for continued education and assistance to landowners to achieve compliance. Threats due to non-compliance are a concern due to immediate potential for surface and groundwater degradation. Sandy river terraces and other highly permeable soils tend to leach waste water easily. Aquifers and drinking water become contaminated via abandoned or unsealed wells and contamination of groundwater by surface water recharge. Surface water is affected by feedlot runoff from open ditches, over topping and failing earthen lagoons, open lot runoff, gullies through a feedlot, etc.

Land application of fertilizer or manure are potential sources of non-point source pollution to both groundwater and surface water. Technical and financial assistance is available for nutrient management planning. The plans will determine the inputs and outputs of a given cropped field. They can be utilized as an ongoing tool to help minimize nutrient inputs and still attain desirable yields. Nutrient management plans are a great tool which helps minimize nutrient inputs and commercial input costs while still attaining desirable yields. There is also an opportunity for landowners to enroll in the Conservation Stewardship Program (CSP) and be rewarded for practicing conservational land stewardship.

SSTS/Wells/Ground Water

These three concerns are grouped together because SSTS (subsurface sewage treatment systems) discharge sewage to the soil that eventually infiltrates to groundwater and wells pull water from groundwater aquifers to the land surface for drinking water as well as other uses. Groundwater also feeds the baseflow of Wabasha County's many streams and rivers.

SSTS

Description

Septic systems can serve a variety of establishments including residences, restaurants, campgrounds, businesses, and schools. These gathering places that have bathroom and kitchen facilities, not discharging sewage to wastewater treatment facilities, should be discharging sewage to a properly functioning SSTS. A SSTS or a septic system is a combination of tanks or other treatment devices providing initial treatment of sewage which ultimately discharges the sewage into the soil for final treatment. Sewage contains pathogens, nutrients both phosphorus and nitrogen, and possibly other chemicals used in kitchens and bathrooms. A properly designed, constructed and functioning SSTS can treat sewage adequately before the treated wastewater percolates into the ground.

Regulations

Wabasha County enforces Minnesota Rules Chapters 7080-7083 through the Subsurface Sewage Treatment System Ordinance. Wabasha County Public Health Department implements the SSTS program.

Wabasha County SSTS 2013 Report to MPCA

In 2013 Wabasha County had 3200 full time dwellings and 960 seasonal dwellings with septic systems. There are also 42 other establishments that use septic systems. Of the total number of

systems, it is estimated that 73% are compliant. In other words, if these septic systems were inspected they would pass a compliance inspection that indicated they met state requirements. Of the remaining systems, an estimated 18% are considered failing and 7% are considered to be imminent public health threats (IPHT). Examples of systems that would be considered IPHT are those where sewage backs up into a house, surfacing systems, 'straight pipes' (meaning they discharge to a ditch or river), or cesspools. Failing systems are those that could not meet the vertical separation distances in the soil and are considered to be failing to protect groundwater.

Small Unsewered Communities

In addition to the concerns with failing or IPHT septic systems, small communities that are unsewered therefore not served by a wastewater treatment facility, may also be problematic. The concern here relates to the fact that in small communities there may be small parcels and parcels may have limiting factors that would make it difficult to put in replacement individual septic systems in the future. These small communities may over time have problems addressing their wastewater needs through individual septic systems because of the lack of usable space for replacement systems. Small unsewered communities that are of particular concern include Minneiska, Theilman, Weaver and Millville.

Wells

Safe Drinking Water Act and Public Water Supplies

All residents of Wabasha County rely on groundwater for their drinking water via water supply wells. Approximately 2/3 of Wabasha County residents rely on ten community public water supplies for water. These communities are Elgin, Hammond, Hiawatha Estates Subdivisions (I, II, and III), Kellogg, Lake City, Mazepa, Millville, Plainview, Wabasha, and Zumbro Falls. In addition there are 40 other establishments that are considered non-community public water supplies. These would include campgrounds, rural churches and businesses. All of these systems fall under the Safe Drinking Water Act regulations that are carried out in Minnesota by the Minnesota Department of Health Drinking Water Protection Section. The other 1/3 of the Wabasha county residents are served by private wells in their homes. Private water supply wells are not regulated under the Safe Drinking Water Act.

Minnesota Well Code

The proper construction of new wells, reconstruction or repair of existing wells and the proper sealing of unused wells is regulated under Minnesota Rule Chapter 4725 also known as the "Minnesota Well Code". Wabasha County Board of Health has been delegated the authority to enforce the well code for well construction and sealing except for the construction and sealing of community public water supply wells where the responsibility remains with the Minnesota Department of Health. Much has been learned over time about proper well construction. Since 1974, all new water wells constructed in Minnesota must meet the location and construction requirements of the "Minnesota Well Code".

Well and Aquifer Vulnerabilities

Water supply wells can provide safe water for many years. However, as water supply wells age, they will deteriorate and eventually lose their ability to keep contaminants out of the water. In addition, wells that were constructed many years ago may not have been drilled in a manner that

keeps out contaminants. They also may have been constructed into aquifers that are now considered too shallow and not covered with sufficient geologic protective layers to keep out surface contamination.

Water supply wells and the aquifers that provide the water to these wells can be assessed for their vulnerability/susceptibility to surface contamination. Such an assessment typically would consider well construction, geologic sensitivity or the intrinsic ability of the earth's geologic materials to protect a well or well field from contaminant sources. Also by evaluating the water chemistry data especially the presence of contaminants in well water samples can help determine the vulnerability.

Hydrologists at the Minnesota Department of Health Source Water Protection Unit have assessed the vulnerability of all public water supply wells. Of the ten community public water supply systems in Wabasha County, nine have wells that are considered to be vulnerable to contamination. To address these issues as well as developing other protective measures for public water supply wells and the aquifers that supply the wells, community systems have to develop Wellhead Protection Plans. In Wabasha County nine out of the ten communities have developed or are developing wellhead protection plans.

Nitrate-Nitrogen

The most common contaminant found in vulnerable water supply wells is nitrate. Nitrate is an oxidized form of nitrogen. Nitrate which is very soluble in water easily leaches into the groundwater. The Safe Drinking Water Act standard for nitrate-nitrogen is 10 ppm or mg/l and is based on short term exposure of infants. This is also the health risk limit above which MDH recommends not be used by private wells owners where water would be ingested by infants (< than 6 months of age). Nitrate is an indicator of vulnerability, is commonly present when other contaminants are also present (an indicator analyte) and is inexpensive to measure. The presence of nitrates at concentration of 3 mg/l or greater would be attributed to activities on the land surface.

There are several sources of nitrate-nitrogen data for wells. Public water supply wells are routinely sampled as part of the monitoring requirements under the Safe Drinking Water Act. Private well owners are encouraged to take samples for nitrate and coliform bacteria (indicator for the presence of pathogens) and nitrate and coliform bacteria are required to be sampled when a new well is drilled. Many private well water samples are sent to the Olmsted County Southeastern Minnesota Water Analysis Laboratory (SEMWAL) for analysis.

In addition to this information, Wabasha County and Wabasha County SWCD have participated in the Southeast Minnesota Volunteer Nitrate Monitoring Network. This well network was developed with uniformly distributed wells in southeast MN counties. The wells were sampled for nitrate from 2007-2012. The network has now been renamed the Southeast Minnesota Domestic Well Monitoring Network and was expanded to sample additional parameters, such as arsenic, metal, and gross alpha radiation at select locations. Olmsted County currently collects samples for all counties in the program and evaluation is ongoing.

Unused Unsealed Wells

As previously stated, older wells can deteriorate. That is certainly the case with wells that are no longer in use. These wells, sometimes called "abandoned" wells, can pose a serious threat to groundwater quality by providing a pathway for contaminants to travel deep into groundwater,

bypassing the natural protection usually provided by layers of clay, silt, and other geologic materials. This can threaten water quality in city water wells, wells that serve local business, or private wells that serve individual homes. Communities that have completed part 2 of wellhead protection plans should have an inventory of unused unsealed wells. However, there is not a comprehensive inventory of unused unsealed wells for the county.

Groundwater

As source of water to trout streams and rivers

Springs and seeps are surfacing groundwater that provide the source of trout streams in Wabasha County. The water coming from springs and seeps is cold water which is needed for trout and other coldwater aquatic species. There are 96 miles of DNR designated trout streams in Wabasha County. Zumbro River as the main warm water stream(s), along with part of Lake Zumbro could be included. The main stem of the Zumbro (below the lake) provides various recreation opportunities for canoeing, tubing and fishing for an assortment of gamefish species including walleye, sauger, smallmouth bass and channel catfish on approximately 60 miles of river. The North Fork of the Zumbro in Wabasha County is approximately 10 miles long and provides fishing for the same species as well as trout. These streams and the larger rivers, the Zumbro, and Whitewater provide significant recreational opportunities for the residents of Wabasha County as well as people visiting the area.

Nitrate-nitrogen (N) in springs, trout waters and rivers

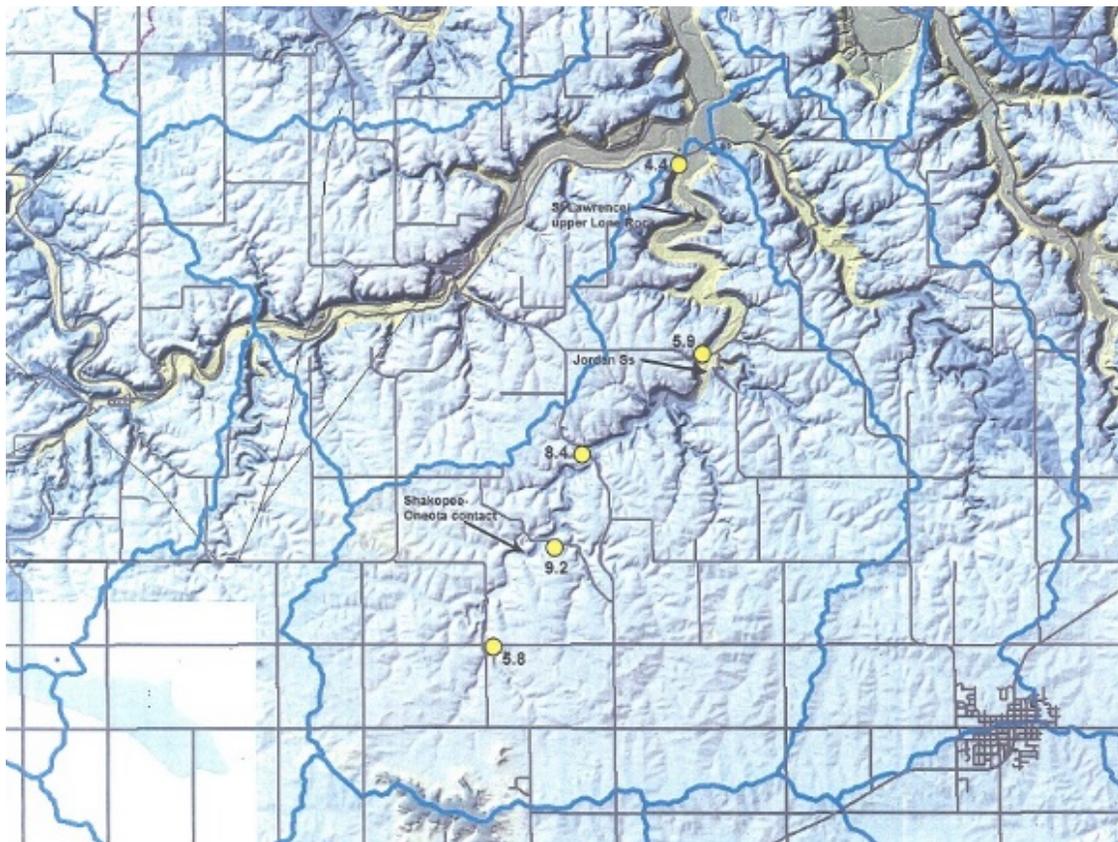
Minnesota recently initiated two state-level efforts related to N in surface waters. The Minnesota Pollution Control Agency (MPCA) is developing water quality standards to protect aquatic life from the toxic effects of high nitrate concentrations. The standards development effort, which is required under a 2010 Legislative directive, draws upon recent scientific studies that identify the concentrations of nitrate harmful to fish and other aquatic life (MPCA 2013).

Also in place is a state-level Nutrient Reduction Strategy, as called for in the 2008 Gulf of Mexico Hypoxia Action Plan. Minnesota contributes the sixth highest N load to the Gulf and is one of 12 member states serving on the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force. The cumulative N and phosphorus (P) contributions from several states are largely the cause of a hypoxic (low oxygen) zone in the Gulf of Mexico. This hypoxic zone affects commercial and recreational fishing and the overall health of the Gulf, since fish and other aquatic life cannot survive with low oxygen levels. Minnesota is developing a strategy which will identify how further progress can be made to reduce N and P entering both in-state and downstream waters (MPCA 2013).

In general observations of nitrate in surface waters indicate that:

- Baseflow via agricultural groundwater is the primary transport mechanism of nitrogen loading in southeast Minnesota; see Nutrient Reduction Strategy (MPCA 2013)
- Baseflow nitrates in the lower segments of trout streams sampled in Wabasha County are typically between 2- 4 ppm nitrate-nitrogen. The exception would be on the North Fork of the Whitewater River where concentrations are higher associated with higher percent of row crop agriculture. In headwater areas, higher nitrate concentrations may be

encountered with changing percentages of row crop agriculture (Watkins, Rasmussen, Streitz et al 2013).



The above example of Long Creek longitudinal sampling depicts decreasing nitrate concentrations moving downstream. The top site is an exception and may be lower because little or no groundwater is present that high in the watershed; this sample was executed by MPCA in December 2014)

- In general SE MN baseflow nitrate in trout streams is correlated with the percent row crop in the watershed (Watkins, Rasmussen, Streitz et al 2013).
- Regarding trends: the two long-term records we have (MDA monitoring at Cold Spring Brook and Gorman Creek headwater spring) show very little change over the past ~10 years but the slope of the line appears to be slightly positive. (Runkel, Anthony C.; Steenberg, Julia R.; Tipping, Robert G; Retzler, Andrew J. (2014). OFR14-02, Geologic controls on groundwater and surface water flow in southeastern Minnesota and its impact on nitrate concentrations in streams. Minnesota Geological Survey. Retrieved from the University of Minnesota Digital Conservancy, <http://hdl.handle.net/11299/162612>).

Link to Other Priority Concerns

Nitrate-nitrogen is a common contaminant in groundwater. Sources of nitrogen to the groundwater can be quite localized but on a regional basis is associated with the use of

commercial fertilizer on row crops, primarily corn. Therefore to decrease nitrate-nitrogen levels in drinking water wells, springs, streams and rivers requires improvement in the management of this nutrient in row crop agriculture as discussed under the Nutrient and Manure Management priority concern. Also land in perennial grass cover does not leach nitrogen like row crop land. Therefore in priority areas maintain or increase perennial cover as further discussed in Forest & Pasture Land.

Forest and Pasture Land

The landscape of Southeast Minnesota, and the area of Wabasha County as one area in particular, is unique. The steep rolling forested hills and oak savannahs containing diverse habitats are enjoyable to those who dwell there and a draw to tourists and nature lovers.

Forest land is the second highest land use at approximately 25% and managed pasture land ranks third and approximately 13% of Wabasha County land use.

Well managed rotational grazing systems improve the health of plants.

Wabasha County SWCD and members of the task force who contributed to the development of this Comprehensive Water Plan are members of the Minnesota Forest Resource (MFRC) Council Southeast Landscape Committee. Those members contributed to the “SE Landscape Plan: A Regional Plan to Guide Sustainable Forest Management” in 2014 and it is currently pending approval. A draft for public review draft is currently available on Minnesota Forestry Resource Council site:

http://mn.gov/frc/documents/council/landscape/SE%20Landscape/SE%20Update_2014/2014_SE_Landscape_Plan-Public_Comment_DRAFT-2.pdf. Final draft approval is anticipated soon. Referral to that plan is advised for planning purposes to attain ecological, social, and economic goals for forestry in Wabasha County and all of southeast Minnesota.

Agroforestry is a growing area of research and practice that is being promoted by participating agencies in Minnesota. These practices utilize existing woodlands and create systems that are economically and environmentally beneficial on the landscape while viewing forestry as a component as an overall resource concern within other systems, such as incorporating trees and/or shrubs with crops or livestock.

Properly managed grazing systems that identify and protect sensitive features provide perennial cover and contribute to lessening erosion and improvements in soil health; and they can even be beneficial, if intensively managed, in reducing streambank erosion problems. Improperly managed systems contribute to impacted soils that don't allow infiltration, contribute to stream sediment loads and reduce natural diversity.

Much of Wabasha County's forest and pasture land is placed in steep sloped blufflands, often with highly erodible soils, or in riparian areas that have marginal land use properties. Woodlands are used recreationally throughout the year by hunters, hikers, anglers, wildlife, and outdoor enthusiasts. Increased forage production of a well managed grazing system is beneficial to producers who continue to market their products for public consumption. It is important to manage and prevent invasive species, erosion issues, and loss of habitat and corridors and seek to increase value and acres of these systems.

Since the priority concerns were developed and went through an assessment process, the issue of Aquatic Invasive Species (AIS) Prevention has been brought forward through legislative funding that is overseen by the Department of Natural Resources (DNR). The SWCD administers the program through an agreement with Wabasha County and houses an AIS Program Coordinator. This coordinator is working with DNR to implement the program according to their requirements and fit duties to complement and assist with current DNR AIS prevention work. The SWCD has chosen to put focus on threats and potential threats to streams in the County and on education for all ages.

Watershed Management Approach



(Diagram - MPCA) (ZWP)

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place. <http://water.epa.gov/type/watersheds/whatis.cfm>. John Wesley Powell, scientist geographer, we summarizes the description of a watershed:

"that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

Wabasha County is part of 3 major watersheds are shown on the map below. The County also crosses, in a lesser fashion, the Lower Chippewa and the majority of the contributing area of that watershed is in Wisconsin.

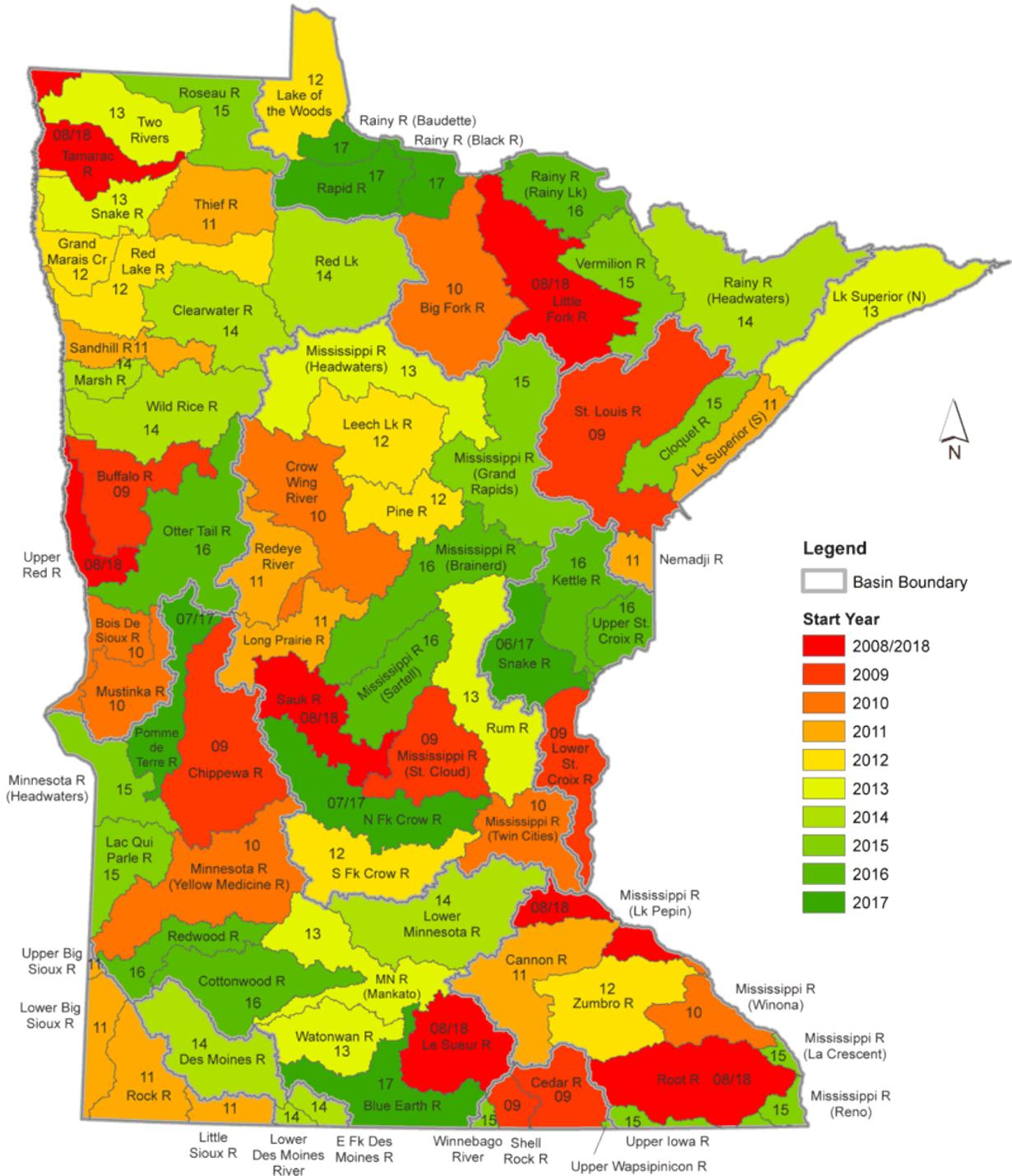


Map shown is portion of map taken from <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/basins/basins-and-watersheds-in-minnesota.html>

The other 3 watersheds are the Mississippi River-Lake Pepin (07040001) Watershed that includes the counties of Dakota, Scott, Goodhue, Wabasha, and Washington in Minnesota and Mississippi River-Winona (07040003) Watershed that includes the counties of Wabasha, Olmsted, and Winona in Minnesota. A large portion of the County crosses the Zumbro River (07040004) Watershed and includes the Minnesota Counties of Steele, Goodhue, Wabasha, Olmsted, Rice, and Dodge. Wabasha County has been a corroborative participant with other Counties and Districts to strategically plan for solutions to water quality concerns.

“The passage of Minnesota’s Clean Water Legacy Act in 2006 provided policy framework and money for state and local governments to accelerate efforts to monitor, assess, and restore impaired waters, and to protect unimpaired waters. Following the passage of the Act, the MPCA began implementing what it calls the Watershed Approach. There are 81 major watersheds in Minnesota. Intensive water quality monitoring and assessments will be conducted in each of these watersheds every 10 years. During the 10-year cycle, the MPCA and its partner organizations work on each of the state's watersheds to evaluate water conditions, establish priorities and goals for improvement, and take actions designed to restore or protect water quality. When a watershed's 10-year cycle is completed, a new cycle begins.

The primary feature of the watershed approach is that it focuses on the watershed's condition as the starting point for water quality assessment, planning, implementation, and measurement of results. This approach may be modified to meet local conditions, based on factors such as watershed size, landscape diversity, and geographic complexity (e.g. Twin Cities metro area).” <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/watershed-approach/index.html>. The state is divided into watersheds as the map below shows.



As part of the protection and restoration of water quality planning MPCA developed a process to identify and address threats to water quality in each of these major watersheds. This process is called WRAPS or the Watershed Restoration and Protection Strategy. WRAPS has four major steps or phases. Step 1. Monitor water bodies and collect data Step 2. Assess the data Step 3. Develop strategies to restore and protect the watershed's water bodies Step 4. Conduct restoration and protection projects in the watershed. The watershed approach was adopted by the MPCA in 2008 to follow the recommendations by the Clean Water Council and as directed by

the Minnesota Legislature. And, significant funding is provided by the Minnesota Clean Water Fund.

As stated MPCA's website, <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/watershed-approach/index.html>,"the improved system allows efficient and effective use of public resources in addressing water quality challenges across the state. Concentrating efforts at the major watershed scale ensures:

- an ongoing, predictable cycle for water quality management and evaluation
- a more efficient approach to addressing impairments
- a common framework for monitoring, TMDL studies, assessments, setting required pollutant reductions, and implementation strategies
- improved collaboration and innovation
- increased stakeholder interest and local support
- a reduction in the cost of improving the quality of waters

The water quality management cycles for the 81 major watersheds are staggered, with 8 to 10 watersheds beginning a new cycle each year. By 2017, all watersheds will have at least begun their first cycle, and those that began in 2008 will enter their next cycle."

The MPCA is currently in the process of conducting WRAPS for a number of watersheds. Wabasha SWCD has already participated on 2 of those assessments for the Mississippi-Winona watershed that included portions of the Whitewater River in Wabasha County and the Lake Pepin with Goodhue County SWCD. Zumbro River assessment is upcoming. These projects identify water quality stressors as well as potential solutions.

The SWCD, in light of this approach, now identifies subwatersheds and uses the same assessment strategy, along with any information gained from the larger watershed assessments to plan for restoration and protection within the larger watershed framework. Current assessments include East Indian Creek, Miller-Gilbert Creek (partnering with Goodhue County), and Cold Spring Brook. These kinds of subwatershed evaluations will be ongoing to prioritize projects for funding proposals.

Urban Issues

The majority of this plan, as well as past plans, relates water quality and quantity issues and solutions to rural and agricultural sources and applies solutions to those settings. Citizens in expanding urban setting have vested interest and responsibility in water quality issues, as well. All cities in Wabasha County are either built along public waters, have drainage that contributes to them, or wetlands that provide filtration for groundwater and streams.

Consideration must be given to runoff filtration issues resulting from stormwater drainage. Proper filtration is also important for sediment and nutrients delivered to streams from lawns and infrastructure.

Education to municipals and residential landowners on water quality issues and the karst geology of our region would be valuable. Providing education on use of chemicals on lawns and how those are delivered with waste and sedimentation to groundwater and streams would also be worthwhile. While agricultural producers are generally familiar with calculating application rates

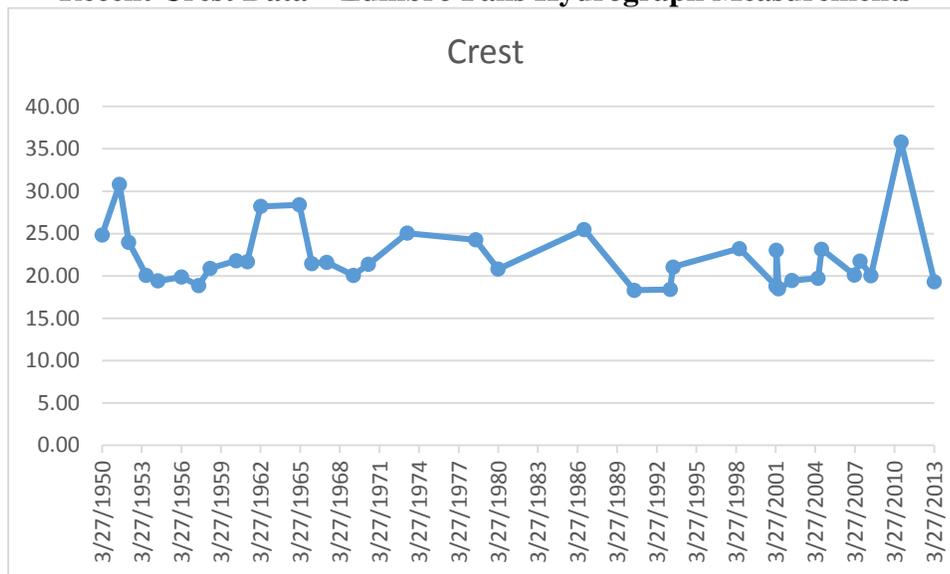
for fertilizers and pesticides, many urban landowners are not and tend to over apply. There may be a need to assess use of chemicals in city parks, many of those are at edges of public waters.

Quantity of flow is related to urban practices, as well. Impervious surfaces quickly move water into storm drains or directly into streams or rivers, carrying nutrients and sedimentation with it. Incorporating storage practices that slow release or provide filtration, such as rain gardens, roof top gardens, rain barrels, alternative vegetative lawn solutions, stormwater management areas, and utilizing pervious surface applications would help lessen quantity of water contributing to flooding, keep water where it can be utilized by municipals and landowners, and provide filtration for water quality improvement.

Discussion of Flood Events

In recent years Wabasha County has experienced flood events that have resulted in millions of dollars of property damage. Flooding is a concern of the Wabasha County Local Water Management Task Force and it must be addressed. The following river crest data listing above flood stage crests is taken from a US Geological Survey hydrograph in Zumbro Falls, one of the most impacted areas in the flood of 2010, and listed on the National Weather Service website, <http://water.weather.gov/ahps2/hydrograph.php?wfo=arx&gage=zumm5>. Note that the flood stage categories listed in feet are: Major Flood Stage - 26, Moderate Flood Stage - 24, Flood Stage - 18, Action Stage - 15.

Recent Crest Data – Zumbro Falls Hydrograph Measurements



Wabasha County will continue to experience flood events. The above information lists only one central location on the Zumbro River. Wabasha County also has many miles of streams to consider and the eastern portion of Wabasha County sits on the Mississippi River and all are affected by out of County upstream weather, spring melt, and flooding events. Flooding is a contributing factor to all watersheds and affects all of the other priority concerns listed in this plan in one way or another. Taking a watershed approach to flood prevention and remediation is

one avenue to help lessen the amount of property damage and impacts to human life. Identifying problems and finding solutions to lessen the contribution of peak flow into streams and rivers, along with the sediment and nutrients carried with the flow, will minimize the impacts to watersheds and subwatersheds. SWCDs and watershed groups, such as Zumbro Watershed Partnership and Whitewater Joint Powers Board, currently meet to strategize solutions to help reduce peak flow and to improve water quality. All residents of Wabasha County are impacted by floods due to the demand on emergency services and interruption of essential services, as well as the financial tax funded sources required to repair public infrastructure. There are strategies and actions priority concerns discussed in this Local Water Management Plan that can also be considered flood mitigating activities. Practices that control erosion, isolate nutrients, slow runoff, and those practices that are vegetative in nature and keep water available for growth will also reduce peak flow contributing to flooding.

Goals, Objectives, Actions, and Implementation Plan of Priority Concerns

Soil Erosion – the goal is to limit and reduce erosion and control sediment associated with land use practices.

Annual Cost Estimate: \$344,200

Objective 1: Provide technical and financial assistance to Wabasha County landowners who are interested in reducing erosion and sediment by implementing management practices thereby contributing to the effort to improve water quality.

Action Item 1a: Continue to work with Wabasha County landowners, residents and youth to provide information, education, and options to reduce soil erosion and improve water quality. Tools to be used are landowner personal contacts, educational events, media and public outreach. (1 news article per year, 80 landowner contacts, 1 educational day for community, 1 Conservation Day for youth, school visits, create an SWCD Facebook page)

Partners: SWCD, NRCS, DNR, Participating Professionals, County Schools

Time Line: 2015 - 2024

Cost: \$7,500/yr.

Action Item 1b: Seek funding and landowner interest to install 5 seeded acres of waterways, 5 structures, 1 terrace and 3 WASCOD systems per year. Pending funding, it is estimated that 5 more structure and basin systems per each HUC12 could be installed. This would treat approximately 1,000 to 1,500 acres per year.

Partners: SWCD, NRCS

Time Line: 2015 - 2024

Cost: \$85,000/yr.

Action Item 1c: Seek funding to create cost share program and work with landowners to install 250 acres of contours/strip cropping annually.

Partners: SWCD, NRCS

Time Line: 2015 - 2024

Cost: \$14,500/yr.

Action Item 1d: Continue to provide staff time to promote, install and maintain long-term conservation programs such as RIM and work with partner agencies to promote easement programs such as CRP, WRP and stream easements. Ideally obtain funding to staff a Farm Bill Assistance Technician and use some FTE funding for these programs.

Partners: SWCD, County Staff, Landowners

Time Line: 2015 - 2024

Cost: \$30,000/yr.

Action Item 1e: Identify priority and sensitive area solutions and justify funding for some stream bank projects. Participate on and seek funding for 1 project per year.

Partners: SWCD, DNR, Trout Unlimited, NRCS, TNC, SE Landscape Committee

Time Line: 2015 - 2024

Cost: \$50,000/yr.

Action Item 1f: Plan erosion control practices in target watersheds. Utilize information from WRAPS, as developed, to ensure planned practices are prioritized and targeted to address specific resource concerns. There are approximately 21 HUC 12 watersheds and 3 HUC 8 in Wabasha County. Use best available offsite planning, create mailing notifications to notify landowners and gain interest in plan.

Partners: SWCD, NRCS, DNR, SE Landscape Committee, Landowners

Time Line: 2015 - 2024

Cost: \$5,000/yr.

Objective 2: Increase, retain, and maintain perennial vegetation and improve soil health throughout Wabasha County.

Action Item 2a: Develop and send one mailing per year. Put together one package of current educational materials annually that includes the environmental and economic benefits of improved soil health. Use media forms to disseminate information. Write 1 newspaper articles per year on the topic. Hold field days and educational events that promote best management practices that improve soil health such as cover crops, conservation tillage, and crop rotation, including hay in rotation, and field and road borders. (1 event per year)

Partners: SWCD, NRCS, DNR, MDA, U of M Ext.

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Action Item 2b: Continue to use existing funding sources available through NRCS and find new sources to implement practices and create a District program to improve soil health such as cover crops (80 acres/yr.), no-till (80 acres/yr.), crop rotation including hay in rotation, (250 acres/yr.), and field and road borders (7 acres/yr.).

Partners: SWCD, NRCS, DNR, MDA, U of M Ext.

Time Line: 2015 - 2024

Cost: \$56,200/yr.

Objective 3: Enforce Row Crop set Backs

Action Item 3a: Educate Township and County board supervisors, County staff and landowners on the Shoreland Ordinance and the importance of buffers. Do this through agency meetings (4/yr.), public meetings (1/yr.), and educational events (1/yr.). Increase efforts with mailings (3/yr. for first year, then 1/yr.) and media articles (3 for first year and then 1/yr.).

Partners: SWCD, TWP, County Staff, Elected Officials, DNR

Time Line: 2015 - 2024

Cost: \$30,000 in implementation year, \$23,000/yr. beyond

Action Item 3b: Utilize GIS land use buffer to identify location needs of buffers on layer developed in 2012 through the SE Water Resources Board.

Partners: SWCD, County Staff, Landowners

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Action Item 3c: Provide Wabasha County Environmental Services Department with proper technical support when addressing buffer related issues.

Partners: SWCD, County Staff

Time Line: 2015 - 2024

Cost: \$7,500/yr.

Action Item 3d: Coordinate with NRCS and FSA for CRP enrollments. Potentially apply for grant funds to support a buffer programs.

Partners: SWCD, NRCS, FSA, DNR, SE Landscape Committee, TNC

Time Line: 2015 - 2024

Cost: \$25,000/yr.

plus land payments.

Action Item 3e: Target landowners of marginal lands that are not enrolled in CRP or other long-term conservation programs for educational mailings. Work with partners and use available sources or seek new funding sources to implement long term conservation programs for those areas.

Partners: SWCD, DNR, SE Landscape Committee, TNC

Time Line: 2015 - 2024

Cost: \$25,000/yr. for cooperative work,
plus land payments.

Action Item 3f: Promote 50 acres/yr. of harvestable buffers to landowners who can utilize those perennial crops.

Partners: SWCD, DNR, SE Landscape Committee, TNC, Trout Unlimited, Pheasants Forever

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Nutrient and Manure Management – the goal is to improve water quality through best management practices and provide landowners with education and resources available implement practices.

Annual Cost Estimate: \$325,000

Objective 1: Educate and promote sound comprehensive nutrient management practices to County landowners. Provide technical and financial assistance where possible.

Action Item 1a: Utilize revised MDA Nitrogen Fertilizer Management Plan guidance on BMP evaluation. Create local advisory teams and seek involvement of local crop advisors and fertilizer retailers. Work with partners to have manure and management field days and educational events (2 events/yr.). Seek a research site for corn following alfalfa crediting research with partners.

Partners: SWCD, NRCS, MDA, Local Fertilizer Dealers and Applicators

Time Line: 2015 - 2024

Cost: \$8,500/yr.

Action Item 1b: Explore options and potential incentives for livestock operations with less than 300 animal units to take proper manure and alfalfa credits. Gain information

that will provide background on existing commercial fertilizer use to provide on farm nutrient budget. Do two “fixes” each year

Partners: SWCD, NRCS, MDA, U of M

Time Line: 2015 - 2024

Cost: \$45,000/yr.

Action Item 1b: Continue manure spreader calibrations, manure sampling and nutrient management education. Provide information on financial incentives for manure storage and nutrient management. Inform producers about the benefits of grid sampling to prevent over application of nutrients.

Partners: SWCD, NRCS, MDA, U of M

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Action Item 1c: Promote and market cost-share programs that assist in nutrient management plan writing and practice installation for 5 landowners per year.

Partners: SWCD, NRCS, MPCA, U of M

Time Line: 2015 - 2024

Cost: \$24,000/yr.

Action Item 1d: Educate 10 landowners per year about and review feedlot rules, as well as the methods and value of reducing runoff from their lots, and the importance of record keeping with feedlot owners.

Partners: SWCD, NRCS, MPCA, U of M

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Action Item 1e: Identify 2 large manure storage projects biannually that would improve environmental quality and provide pollution reduction. Seek funding, such as Clean Water Funding, to work with landowners providing education and technical assistance and to implement the projects.

Partners: SWCD, NRCS, MPCA, U of M

Time Line: 2015 - 2024

Cost: \$350,000/biannually

Objective 2: Identify target areas and sensitive features for nutrient applicators, decision makers and planners in GIS formats.

Action Item 2a: Seek funding, possibly an Accelerated Implementation Grant that would utilize LIDAR, WRAPS, DNR Maps, Shoreland Mapping, and existing methods to identify feedlots with direct connection to intermittent or perennial streams, and riparian areas to help prioritize targeted projects.

Partners: SWCD, NRCS, MPCA, DNR, ZWP, County Staff, Landowners

Time Line: 2015 - 2024

Cost: \$18,500/yr.

Action Item 2b: Use the information from 2a to provide technical and financial assistance to landowners to implement 2 feedlot fixes per year.

Partners: SWCD, NRCS, MPCA, DNR, ZWP, County Staff, Landowners

Time Line: 2015 - 2024

Cost: \$45,000/yr.

Objective 3: Provide information and education on the regulations and benefits of fertilizers and other chemical applications.

Action Item 3a: Host chemical/fertilizer applicators meeting each year with local cooperatives.

Partners: SWCD, Local Cooperatives, MPCA, County Staff, Elected Officials

Time Line: 2015 - 2024

Cost: \$2,000/yr.

Action Item 3b: Host chemical/fertilizer applicators meeting each year with cities, townships, and County applicators. Include urban and private landowners and businesses.

Partners: SWCD, LGU's, MPCA

Time Line: 2015 - 2024

Cost: \$2,000/yr.

SSTS/Wells/Groundwater – The goal is to continue to assess water sources in Wabasha County for impairments and take actions to improve the groundwater and surface water resources and to increase septic system compliance.

Annual Cost Estimate: \$42,000

Objective 1: Wellhead protection of public water supplies.

Action Item 1a: Promote RIM and Continuous CRP in DWSMAs characterized as highly or very high vulnerability. Letters and site visits to landowners in those areas. (2 projects per year)

Partners: SWCD, MDH, NRCS, FSA

Time Line: 2015 - 2024

Cost: \$5,600/yr.

Action Item 1b: Promote nitrogen management BMPs in conjunction with public water supplies in vulnerable DWSMAs. Publicize through landowner contact, field days and gatherings with landowners, and demonstration projects.

Partners: SWCD, MDA, MDH, NRCS, SEMNWRB

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Action Item 1c: Provide support to cities as needed in Wabasha County to carry out their Wellhead Protection Plans.

Partners: SWCD, MDA, MDH, City Government Staff

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Objective 2: Assist private well owners in protecting and/or improving their drinking water supplies.

Action Item 2a: Use well records to identify abandoned wells. Seek funding for student worker or other staff to this and to send out a brochure and letters to County residents for

discovery/disclosure of abandoned wells. Work to identify and GPS wells not existing on MDH records.

Partners: SWCD, County Staff, MDH

Time Line: 2015 - 2024

Cost: \$7,500/yr. for summer intern

Action Item 2b: Pursue Well Sealing Grant in Clean Water Funding to provide a program to seal abandoned wells. Target Drinking Water Supply Management Areas (DWSMAs) or areas within 5 miles of DWSMAs. (Seal 5 wells per year)

Partners: SWCD, MDH

Time Line: 2015 - 2024

Cost: \$2,500/yr.

Objective 3: Water quality of private wells.

Action Item 3a: Identify areas of high priority based on MDH Nitrate probability map and the Wabasha County Geologic Atlas Sensitivity to Pollution (Plate 10), and areas with historically high nitrates or other contaminants in private well water by review of past research.

Partners: SWCD, MDA, MDH, County Staff, SEMNWRB

Time Line: 2015 - 2024

Cost: \$3,500/yr.

Action Item 3b: Continue to participate in sampling and analyses of private wells to obtain water chemistry data including Southeast Minnesota Domestic Well Monitoring Network. Administer and maintain the network of citizen volunteer nitrate monitors in Wabasha County. Organize sample collection from volunteers annually to maintain baseline data and share data sets with other local and state agencies involved with well data each year.

Partners: SWCD, MDA, MDH, SEMNWRB, private landowners

Time Line: 2015 - 2024

Cost: \$5,000/yr.

Action Item 3c: Hold nitrate clinics and educational events for public information and outreach. Seek possible funding sources such as BWSR CWF Community Partners grants.

Partners: SWCD, MDA, MDH, NRCS, SEMNWRB

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Action Item 3d: Seek funding sources to offer free nitrate tests and education materials for homes with pregnant women to provide increases awareness of impacts of nitrates in water in homes with young children.

Partners: SWCD, MDA, MDH, NRCS, SEMNWRB

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Objective 4: Identify and address imminent threats to public health from septic systems.

Action Item 4a: Continue to offer low interest loan funding through MDA's AgBMP Loan Program and continue to seek alternative cost share funding.

Partners: SWCD, County Staff, MDH, MDA

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Objective 5: Help communities in need of proper community sewer systems.

Action Item 5a: Assist Theilman, Weaver, and Minneiska in finding solutions to implement a proper community sewer system to protect water quality.

Partners: SWCD, County Staff, MDH, MDA

Time Line: 2015 - 2024

Cost: \$6,400/yr.

Forest and Pasture land – the goal is to increase and improve quality acreage with the use of better BMP’s through forestry and promote rotational grazing.

Annual Cost Estimate: \$248,000

Objective 1: Promotion and implementation of rotational grazing.

Action Item 1a: Educate producers on the economic and environmental benefits of rotational grazing. Hold field days and tours. (1 event per year)

Partners: SWCD, NRCS, WJPB, Grazing Associations

Time Line: 2015 - 2024

Cost: \$2,000/yr.

Action Item 1b: Work with 3 landowners per year to establish rotational grazing, with well managed rotational grazing practices, in marginal land or riparian areas. (Seek District funding to implement 3 rotational grazing systems/yr.)

Partners: SWCD, NRCS, WJPB, Grazing Associations

Time Line: 2015 - 2024

Cost: \$22,500/yr.

Objective 2: Promote retention and best management of forest land.

Action Item 2a: Continue to have multi-agency cooperation to develop forestry based programs and participate in planning and implementation processes. Collect, organize and evaluate data relating to forestry and share data between agencies and local officials. Find ways to improve the delivery of technical and financial assistance on forest management to private landowners and find ways to increase funding for private forest management.

Partners: SWCD, DNR, NRCS, U of M, SE Landscape Committee, TNC

Time Line: 2015 - 2024

Cost: \$5,000/yr.

Action Item 2b: Seek financial assistance program options to restore and establish forest land. Focus on programs with a life span such as CRP or RIM or land purchase by agencies such as DNR or TNC interested in connecting wildlife corridors. (10 acres per year)

Partners: SWCD, NRCS, U of M, SE Landscape Committee, TNC, DNR

Time Line: 2015 - 2024

Cost: \$5,000/yr.

plus land payments.

Action Item 2c: Promote the Ecological Classification System (ECS) and Native Plant Community (NPC) system as a guide to developing land management strategies. Include NPC classification in stand examination procedures and use this information to inform cover type site selections. Use this information to identify and protect important or critical ecological areas within the region. Provide education to 10 landowners per year on economic and environmental benefits of proper forest management.

Partners: SWCD, DNR, NRCS, U of M, SE Landscape Committee, TNC, WJPB

Time Line: 2015 - 2024

Cost: \$4,500/yr.

Action Item 2d: Provide forestry management education to landowners and encourage them to get Forestry Plans. (Provide education to 10 landowner contacts per year and hold one forestry educational event)

Partners: SWCD, County Staff, DNR, NRCS, U of M, SE Landscape Committee, TNC, WJPB

Time Line: 2015 - 2024

Cost: \$8,500/yr.

Action Item 2e: Seek funding for watershed forestry initiative such as Healthy Forests Healthy Waters (currently in progress in East Indian Creek) to address overall landscape issues in individual watershed. Focus on one watershed every 2 years. Address overall resource concerns and implement forest health projects for 10 landowners per year.

Partners: SWCD, County Staff, DNR, NRCS, U of M, SE Landscape Committee, TNC, WJPB

Time Line: 2015 - 2024

Cost: \$45,000/yr.

Action Item 2f: Explore program options to establish riparian buffers in formerly grazed or cropped areas. Seek programs with a life span such as CRP or RIM. Work with agencies such as TNC or DNR that purchase marginal land and restore to connect riparian corridors. Offer as an assistance option in enforcing the Shoreland Ordinance.

Partners: SWCD, NRCS, MDA, U of M, SE Landscape Committee, TNC, DNR, WJPB

Time Line: 2015 - 2024

Cost: \$22,500/yr.

Action Item 2g: Support and promote agroforestry initiatives. Support staff training and education on agroforestry practices. Pass along information and resources to landowners. Seek funding sources for install 20 acres of agroforestry practices annually.

Partners: SWCD, NRCS, MDA, U of M, SE Landscape Committee, TNC, DNR

Time Line: 2015 - 2024

Cost: \$15,000/yr.

Action Item 2h: Hold field days and educational events that highlight and promote good forest management practices and give direction to landowners. Provide youth education on forestry for the next generation. (1 event/yr., 1 youth education opportunity/yr.)

Time Line: 2015 - 2024

Cost: \$3,000/yr.

Objective 4: Promote best management practices for control of invasive species.

Action Item 4a: Continue to provide information and education via mail, media, landowner outreach and educational events. (1 mailer, 2 news articles, 1 educational event per year)

Partners: SWCD, County Staff, DNR, NRCS, U of M, SE Landscape Committee, TNC, WJPB

Time Line: 2015 - 2024

Cost: \$5,000/yr.

Action Item 4b: Continue to track invasive threat potential and map progress of existing species. Monitor progression of discovered threats.

Partners: SWCD, County Staff, DNR, NRCS, U of M, SE Landscape Committee, TNC, landowners

Time Line: 2015 - 2024

Cost: \$2,500/yr.

Action Item 4c: Continue to apply for Clean Water Funding for the Cooperative Weed Area Management Program (CWMA)

Partners: SWCD, DNR, NRCS, U of M, SE Landscape Committee, TNC, landowners

Time Line: 2015 - 2024

Cost: \$7,500/yr.

Action Item 4d: Continue to implement the AIS Prevention Program through currently hired AIS Program Coordinator. Follow current plan and develop as needed or required.

Partners: SWCD, DNR, County

Time Line: 2015 - 2024

Cost: \$100,000/yr. (approximate current funding through legislative action)

Watershed Management - the goal is to work with cooperative partners taking a watershed approach for measurable improvement of water quality.

Annual Cost Estimate: \$304,000

Objective 1: Utilize the watershed restoration and protection approach for planning and implementation strategy.

Action Item 1a: Partake in intensive HUC8 and HUC12 collaborations and BMP implementation. Establish 1 subwatershed every other year as a target. Identify stressors and resource concerns. Work with landowners to line up projects, implement practices with available funding sources such as EQIP. Seek funding through Clean Water Funding for implementation of identified practices.

Partners: SWCD, NRCS, MPCA, ZWP, DNR, TNC, WJPB

Time Line: 2015 - 2024

Cost: \$75,000 per watershed

Action Item 1b: Provide education to landowners and the general public. Organize tours that showcase watershed implementation areas and present the environmental benefits achieved. (1 tour every 2 years as watershed projects are completed)

Partners: SWCD, NRCS, MPCA, ZWP, DNR, TNC, WJPB, elected officials
Time Line: 2015 - 2024 **Cost:** \$3,000/biannually

Action Item 1c: Participate in Watershed Resource and Protection Strategies (WRAPS) projects for area within Wabasha County. Example WRAPS projects include the Mississippi-Lake Pepin, Mississippi-Winona, and Zumbro River.

Partners: SWCDs, County Staff, Elected Officials, MPCA, WJPB
Time Line: 2015 - 2024 **Cost:** \$4,500/yr.

Action Item 1d: Collaborate with partner agencies for One Watershed One Plan planning and projects. Seek BWSR funding to implement one comprehensive plan per major watershed.

Partners: SWCDs, County Staff, Elected Officials, ZWP, MPCA, WJPB
Time Line: 2015 - 2024 **Cost:** \$4,500/yr.

Objective 2: Protect, maintain, and expand priority natural areas for watershed health.

Action Item 2a: Target largely unimpaired areas of natural diversity for protection. Identify potential stressors and watershed BMPs that will control the threat potential.

Partners: SWCD, NRCS, DNR, TNC, SE Landscape Committee, Trout Unlimited, Pheasants Forever, MPCA, MDA
Time Line: 2015 - 2024 **Cost:** \$7,500/biannually

Action Item 2b: Continue to pursue funding for identified and prioritized projects in the East Indian Creek Watershed to complement the Healthy Forests Healthy Waters projects being done through DNR funding.

Partners: SWCD, BWSR, NRCS, DNR, TNC, SE Landscape Committee, Trout Unlimited, Pheasants Forever, MPCA, MDA
Time Line: 2015 - 2024 **Cost:** \$90,000/biannually

Action Item 2c: Continue work on Miller-Gilbert Creek project prioritization in partnership with Goodhue County. Using strategies identified in Mississippi Lake Pepin WRAPS, establish projects planned and continue to decrease pollutant loads and peak flow to streams and rivers and other water sources.

Partners: SWCD, NRCS, DNR, TNC, SE Landscape Committee, Trout Unlimited, Pheasants Forever, MPCA, MDA
Time Line: 2015 - 2024 **Cost:** \$160,000/biannually

Action Item 2d: Continue work to identify and prioritize subwatershed areas and utilize WRAPS and other research sources to strategize on a watershed level to decrease pollutant loads and peak flow to rivers, streams, and water sources. Plan and seek funding for restoration and protection.

Partners: SWCD, NRCS, DNR, TNC, SE Landscape Committee, Trout Unlimited, Pheasants Forever, MPCA, MDA
Time Line: 2015 - 2024 **Cost:** \$160,000/biannually

Action Item 2e: Promote Wetland Banking sites to increase water storage in watersheds. Establish restoration of 35 acres of restored/created wetlands per year to reduce volume entering streams and detrimental impacts on water quality.

Partners: SWCD, County Staff, DNR, USACE

Time Line: 2015 - 2024

Cost: \$4,500/yr.

plus land payments

Urban Issues – the goal is to address urban issues with the municipalities and townships to improve water quality through the use of urban BMP’s.

Annual Cost Estimate: \$65,000

Objective 1: Address educational needs concerning water quality issues and karst geology.

Action Item 1a: Assess urban issues as a part of Wellhead Protection activities. Work with cities providing technical assistance in determining possible contributors to public drinking water quality.

Partners: SWCD, City Government Staff, MDH, MDA

Time Line: 2015 - 2024

Cost: \$1,000/yr.

Objective 2: Provide education and technical and financial assistance to address nutrient and sediment runoff from urban areas.

Action Item 2a: Survey municipalities to determine staff familiarity with techniques to reduce runoff from urban settings. Extract needs for outreach and assistance in communities. Constitute a basis for determining the extent of outreach needed.

Partners: SWCD, County Staff, City Government Staff, TNC, MPCA, BWSR

Time Line: 2015 - 2017

Cost: \$1,500

Action Item 2b: Support workshops and demonstration sites for and in municipalities that illustrate techniques for reducing runoff from urban settings and work with municipalities in designing a system to report improvements in urban runoff management.

Partners: SWCD, County Staff, City Government Staff, TNC, MPCA, BWSR

Time Line: 2015 - 2024

Cost: \$1,500/yr.

Action Item 2c: Provide professional workshops for municipalities and contractors to educate and demonstrate runoff/erosion control at construction sites biannually.

Partners: SWCD, County Staff, City Government Staff, MPCA, BWSR

Time Line: 2015 – 2024

Cost: \$1,000/yr.

Action Item 2d: Promote an annual tour of homes and commercial sites that demonstrate techniques that reduce runoff.

Partners: SWCD, County Staff, City Government Staff, MPCA, BWSR, private homeowners, elected officials

Time Line: 2015 – 2024

Cost: \$1,500/yr.

Action Item 2e: Encourage homeowners to reduce runoff

Partners SWCD, County Staff, City Government Staff, MPCA, BWSR, private homeowners, elected officials

Time Line: 2015 – 2024

Cost: \$1,500/yr.:

Objective 3: Encourage homeowners to reduce runoff from their property.

Action Item 3a: Develop a rain barrel and compost bin program. Provide education to landowners through mailings, create brochures and hold educational events and have annual rain barrel/compost bin sale.

Partners SWCD, County Staff, City Government Staff, private landowners

Time Line: 2015 – 2024

Cost: \$1,500/yr.

Action Item 3b: Educate landowners on environmentally beneficial lawn care. Discuss reduction of fertilizer and pesticides. Remind them not to cast sweepings, chippings, animal waste into the street. Show alternatives to traditional yards, such as no mow options. Do this through media articles and promote at educational events. Talk to local community organizations.

Partners SWCD, County Staff, City Government Staff, Community Organizations, private landowners

Time Line: 2015 – 2024

Cost: \$1,000/yr.

Action Item 3c: Develop a rain garden/rooftop garden educational program. Include practices that decrease impervious surfaces. Target areas that would benefit from rain garden installation. Raise landowner interest and cooperation through mailings, media, speaking at community events, and door to door contact. Provide education on rain garden system and benefits. Create implementation plan.

Partners SWCD, County Staff, City Government Staff, Community Organizations, private landowners

Time Line: 2015 – 2024

Cost: \$3,500/yr.

Action Item 3d: Seek funding to implement rain/rooftop/impervious replacement garden program through BWSR and available sources.

Partners SWCD, County Staff, City Government Staff, Community Organizations, private landowners

Time Line: 2015 – 2024

Cost: \$30,000/biannually

Objective 4: Develop systems to address untreated stormwater.

Action Item 4a: Develop relationships with Cities to assess needs for untreated stormwater. Research work already done in other areas of the state for example. Develop an implementation plan.

Partners: SWCDs, City Government Staff, County Staff, BWSR, MPCA
Time Line: 2015 – 2024 **Cost:** \$1,500/yr.

Action Item 4b: Use developed implementation plan to apply for funding to administer a program to address stormwater issues, such as an Accelerate Implementation Grant through BWSR or other.

Partners: SWCDs, City Government Staff, County Staff, BWSR, MPCA
Time Line: 2015 – 2024 **Cost:** \$18,000/yr.

Objective 4: Review, implement and enforce shoreland and bluffland ordinances in urban areas.

Action Item 1a: Provide urban education to local municipal staff and landowners on the shoreland and bluffland ordinances and work to provide information on the benefits of maintaining those systems. (1 educational event per year)

Partners: County Staff, City Government Staff, SWCD, DNR, TNC, Community Organizations
Time Line: 2015 – 2024 **Cost:** \$1,500/yr.

Action Item 1b: Continue to enforce and regulate shoreland and bluffland ordinances in urban areas.

Partners: County Staff, SWCD, City Government Staff, DNR
Time Line: 2015 – 2024 **Cost:** \$15,000/yr.

Implementation Schedule – Ongoing Activities

Ongoing Programs

The Priority Concern Scoping Document contains information of concerns that were not directly addressed in this update of the plan. This section contains programs which are currently being implemented to help address those concerns. Thus, as a committee, we decided that including those concerns would be repetitive. This ongoing programs section will inform the reader of current activities which relate to water resources in Wabasha County.

USDA Wetland Regulations (Swampbusters)

This wetland provision of the Farm Bill requires agricultural producers to protect and maintain wetlands on their property in order to be eligible for USDA Farm Program benefits.

WCA

The Wetland Conservation Act of 1991 states that a “no net loss” of drained, filled or excavated wetlands shall occur without a replaced/restored wetland to replace them. The replaced/restored wetland should be of equal or greater size and quality. Wetlands administration falls upon the Local Government Unit (LGU), the Wabasha SWCD through a memorandum of understanding (MOU) between the SWCD and Wabasha County, and the DNR. The LGU issues exemptions, no-loss or replacement plan determinations for drainage excavation or filling activities in wetlands.

DNR Waters Permits

The DNR can also administer WCA in certain instances. DNR does have public waters permits that cover a wide range of activities in when working with lakes, stream, and wetlands. During their permit process, the SWCD is often asked to review and comment on specific projects for WCA and erosion issues.

Feedlots

Wabasha County’s feedlot program includes inspections, education, and enforcement of Minnesota Rules Chapter 7020 and oversees permitting for new and expanding facilities that have under 1000 animal units.

“This chapter governs the storage, transportation, disposal, and utilization of animal manure and process wastewaters and the application for and issuance of permits for construction and operation of animal manure management and disposal or utilization systems for the protection of the environment. This chapter does not address wastes from fish. This chapter does not preempt the adoption or enforcement of zoning ordinances or plans by counties, townships, or cities.” <https://www.revisor.mn.gov/rules/?id=7020.0200>

Minnesota Pollution Control Agency provides funding occurs through the Natural Resources Block Grant for general services. Wabasha County has currently chosen to be undelegated and it does not receive NRBG funding for feedlot services. MPCA conducts required inspections and regulates policy to landowners directly. Other funding could be provided through Clean Water Funding if applied for and approved

CRP

Wabasha County SWCD has worked on the Conservation Reserve Program (CRP) and Continuous CRP (CCRP) enrollments and reenrollments for the past several years through a contribution agreement obtained by the Minnesota Association of Soil and Water Conservation Districts (MASWCD) with the Farm Service Agency (FSA) and NRCS. Currently there are approximately 5,850 acres enrolled in CRP and enrollments and reenrollments continue in Wabasha County.

State Cost Share Program

This program is administrated at the state level by the Board of Water and Soil Resources and locally by the SWCD. This program provides funding for landowners to implement conservation practices on their land. There is also an option for the SWCD to use the funding to provide technical assistance to landowners for federally funded projects. Wabasha SWCD has used this option for several years to cover a portion of costs to employ a District Technician.

EQIP

Environmental Quality Incentive Program is a USDA administered program intended to provide incentives to USDA qualified farm program operators in implementing BMPs on the land. The Natural Resource Conservation Service (NRCS) in Wabasha County funnel about \$250,000 to \$300,000 worth of incentives to landowners annually.

Cost-share practices include grassed waterways, terraces, grade stabilization structures, sediment basins, reduce/no tilling practices, grazing systems, etc. The Wildlife Habitat Incentive Program (WHIP) is another program that provides technical assistance and cost-share opportunities to landowners interested in restoring and enhancing wildlife habitat and fish habitat.

SSTS

The County's SSTS program includes inspections, education, and enforcement of Minnesota Rules Chapter 7080 and oversees permitting for new septic systems. Ag BMP loans are available for upgrading existing systems and well sealing at a low interest rate.

Wells

New well construction, well sealing or any reconstruction or repair of an existing well that modifies the well casing needs to be done by a licensed well contractor. An approved well

construction or well sealing permit is needed before work begins. This office reviews and issues well and well sealing permits to ensure compliance with Minnesota Rules. We take certified water samples when requested. We also provide information on wells and water quality.

Individual Sewage Treatment Systems

Any time a new septic system is to be installed or an existing system is replaced or repaired, an approved septic system permit is required. This permit must be approved before any construction takes place. This office reviews applications and approves septic permits. This office also takes complaints and investigates the validity of complaints relating to septic systems. We also provide enforcement on non-compliant systems. Information on septic systems can also be obtained through this office.

Wellhead Protection

Communities that provide safe drinking water to the public should have some sort of wellhead protection plan established. Basically a wellhead protection area is an area surrounding a well where water is captured and recharges the drinking water supply. This area should be delineated and boundaries clearly labeled. The process of developing a wellhead protection plan needs to be a coordinated effort between; the community where the plan is located, local unit of government, Wabasha County Public Health and the Minnesota Department of Health. Managing land use in this area can have a major influence on a communities drinking water supply in the future.

TMDL

The Minnesota Pollution Control Agency (MPCA), through the Clean Water Act, is the lead agency for conducting the Total Maximum Daily Load (TMDL) studies in the state of Minnesota. TMDL studies can show the source of a particular pollutant and how much (load) of a pollutant a water body can support and steps that can be taken to reduce the pollutant source (Implementation Plan). Lake Pepin TMDL study is currently underway, along with many other water bodies across SE Minnesota. A list of completed, current and future TMDL studies can be found on the MPCA website which is included in the appendix.

Floodplain Management and Shoreland Management

Floodplain Management and Shoreland Management are DNR programs that are administered by the LGU. The Environmental Services Department acts as the LGU for Wabasha County.

The overall goal of the Shoreland program is to preserve and enhance the quality of surface waters, preserve the economic values of shoreland properties and ensure the sustainable use of water and related resources. Under this program restrictions and management guides are followed when a development is in the vicinity of surface water. These guidelines focus on the realization on the value of shoreland areas, and applying best management practices when construction work is needed.

The overall goal of the floodplain program is to reduce flood damages and to protect public health, safety, and welfare.

Shoreland and floodplain BMP's and regulations will continue within Wabasha County. New Emergency Management Agency maps have been compiled and Wabasha County will continue to work with landowners to complete compliance within the shoreland zone.

Appendix

Helpful Web Links

Wabasha County Links

Wabasha County SWCD

<http://www.wabashaswcd.com>

Wabasha County

<http://www.co.wabasha.mn.us/>

Board of Water and Soil Resources (BWSR) Links

Wetlands

<http://www.bwsr.state.mn.us/wetlands/index.html>

State Cost-Share Manual

<http://www.bwsr.state.mn.us/cs/index.html>

Water Plan Information

<http://www.bwsr.state.mn.us/planning/CLWM/index.html>

Minnesota Association of Soil and Water Conservation Districts

<http://maswcd.org/>

Erosion Control Links

Erosion Control Technology Council

<http://www.ectc.org/index.asp>

Minnesota Erosion Control Association

<http://www.mnerosion.org/>

MPCA Stormwater Manual

<http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html>

Minnesota Natural Resources Conservation Service

<http://www.nrcs.usda.gov/wps/portal/nrcs/site/mn/home/>

Minnesota Department of Agriculture (MDA)

General

<http://www.mda.state.mn.us/>

Phosphorous Free Law Information

<http://www.mda.state.mn.us/protecting/waterprotection/phoslaw.aspx>

Minnesota Department of Health (MDH) Source Water Assessment Site (Wellhead Protection)

<http://www.health.state.mn.us/divs/eh/water/swp/index.htm>

Minnesota Department of Natural Resources (DNR)

Waters <http://www.dnr.state.mn.us/waters/index.html>

Minnesota Pollution Control Agency (MPCA)

Manure Application setback Information

<http://www.pca.state.mn.us/publications/wq-f8-11.pdf>

TMDL Link

<http://www.pca.state.mn.us/water/tmdl/>

Clean Water Act Section 319

<http://www.pca.state.mn.us/water/319.html>

Surface Water Assessment (Water Quality Data)

<http://www.pca.state.mn.us/data/eda/index.cfm>

The Minnesota Nutrient Reduction Strategy

<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/nutrient-reduction/nutrient-reduction-strategy.html>

Zumbro Watershed Partnership

<http://www.zumbrowatershed.org/>

Whitewater River Watershed Project

<http://www.whitewaterwatershed.org/index.htm>

Minnesota Forest Resource Council (MFRC)

<http://mn.gov/frc/>

Information on the MFRC Southeast Landscape Committee

http://mn.gov/frc/initiatives_llm_committees_southeast.html

The Nature Conservancy (TNC), Minnesota

<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/minnesota/>

United State Department of Agriculture (USDA) Links

CRP, EQIP, WHIP and Other Related Programs

<http://www.mn.nrcs.usda.gov/programs/>

Web Soil Survey

<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>