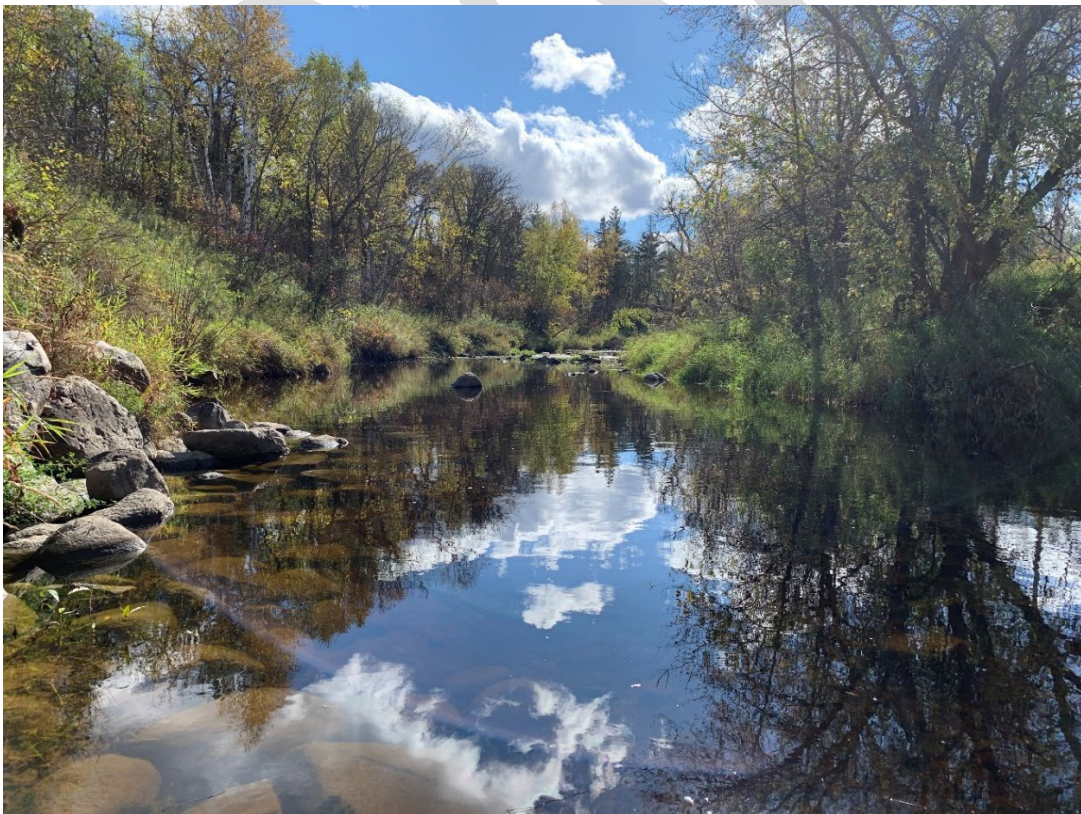


Overall Watershed Management Plan

of the

Two Rivers Watershed District

September 3, 2026



Overall Plan of the Two Rivers Watershed District

Roster of Board of Managers, Staff, & Consultants:

As of August 2026

Board Members	Title	Address	County	Term Ends
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Roger Anderson	Vice President	1561 110th Street Drayton, ND 58225	Kittson	10/31/2027
Daryl Klegstad	Secretary	4151 210th Street Halma, MN 56729	Kittson	10/31/2028
Gerald Olsonawski	Treasurer	P.O. Box 293 Hallock, MN 56728	Kittson	10/31/2028
Bruce Anderson	Manager	18960 170th Ave Greenbush, MN 56726	Roseau	10/31/2026
Scott Klein	Manager	1946 200th Street Hallock, MN 56728	Kittson	10/31/2026
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List of Common Acronyms

Local

TRWD	Two Rivers Watershed District
KSWCD	Kittson Soil & Water Conservation District
RSWCD	Roseau Soil & Water Conservation District
MSWCD	Marshall Soil & Water Conservation District

State

BWSR	Board of Water & Soil Resources
DNR	Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
HSEM	Homeland Security Emergency Management
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health

Federal

EPA	Environmental Protection Agency
NWS	National Weather Service
USGS	United States Geological Survey
NRCS	Natural Resources Conservation Service
USFWS	United States Fish & Wildlife Service

Regional

RRWMB	Red River Watershed Management Board
RRBC	Red River Basin Commission
RRRA	Red River Retention Authority
IWI	International Water Institute
FDRWG	Flood Damage Reduction Work Group
TSAC	Technical & Scientific Advisory Committee (FDRWG)
BTSAC	Basin Technical & Scientific Advisory Committee (IWI)
TAC	Technical Advisory Committee (RRWMB)

Foreword

The Two Rivers Watershed District was established as the second watershed district in the State of Minnesota on October 30, 1957, by order of the Minnesota Water Resources Board. Thereafter, in accordance with Minnesota Statutes, Chapter 112, the Minnesota Watershed Act, the Board of Managers adopted an Overall Plan for projects and improvements for reclamation, drainage, erosion and flood control, and improvement of lands, soils, waters, forest, wildlife, and projects therein. The Minnesota Water Resources Board prescribed the Overall Plan on November 14, 1958, and it was the first Overall Watershed Management Plan of any watershed district in the State of Minnesota prescribed under Minnesota Statute. The Two Rivers Watershed District, in its first Overall Plan revision completed in 1970, proposed several initiatives as solutions to water management problems within the District at that time. These solutions were categorized as flood control and prevention, flood plain and channel improvement, agricultural water management, reforestation and wind erosion protection, wildlife, maintenance of structures, pollution control, and groundwater.

The Overall Plan subsequently underwent several revisions and a major rewrite in 2004. That revision categorized management issues as either *Flood Damage Reduction* or *Natural Resources Enhancements*. This current revision carries forward many of the goals and objectives of previous plans, and provides a general update regarding data and information, completed projects, current issues, and proposed solutions and alternatives.

In 1981, the District adopted the *Rules of the Two Rivers Watershed District*, which governed projects in the District that affected the water resources. These Rules were updated and amended several times, most recently in 2017. The amended *Rules of the Two Rivers Watershed District* require that a permit be granted for any projects that involve ditching, diking, draining, road building, culvert installation or alteration, or any other works which alter the drainage patterns or water quality within the District.

The Two Rivers Watershed District currently has ongoing investigations dealing with water quality and water quantity. The District is actively involved with flood mitigation initiatives, water quality studies, educational initiatives, drainage ditch management, culvert inventories, erosion control, habitat management, natural resources enhancements and other water management activities. These programs and monitoring activities provide the Board of Managers with the data and information they need to make informed decisions regarding the water resources of the District.

The existing purpose and goals of the District are in conformance with the above policies and are outlined in MS 103D.201 Subd. 2. The TRWD intends to annually review this plan, specifically the goals, issues, strategies and preferred outcomes. This annual review will provide opportunity for the Board of Managers to evaluate progress, direct resources, and work with partners to plan, prioritize, and work on solutions. Progress can be tracked using the District's Annual Reports.

GOVERNANCE & ORGANIZATIONAL STRUCTURE

The TRWD Board of Managers is currently made up of 7 members including 2 from Roseau County and 5 from Kittson County. Board members are appointed to a 3-year term by their respective County Commission. The Board of Managers meets once per month to conduct the regular business of the District, and special meetings are occasionally held as necessary.

The TRWD currently employs three people, including a District Administrator and a District Technician who are full-time and a District Administrative Assistant who is part-time. Consulting firms are utilized on an as needed basis for project and general engineering and also an attorney is utilized as needed at the discretion of the Board of Managers.

The TRWD established By-Laws and follows them accordingly for meetings and day-to-day activities. In addition, the Board prescribed their first 'Overall Plan' in 1958, which was the first overall plan of any watershed district in the state of Minnesota. This plan has been updated several times over the years and was last extensively updated in 2004. This 2026 current updated version of the plan will continue to guide and direct the daily, monthly, and yearly operations of the District.

The District operates primarily under **Minnesota Statute 103D**, also known as the 'Watershed Law.' This statute gives watershed districts authority to work on flood control, drainage, water quality, water supply, and other issues that affect water natural resources within rivers, lakes, streams and groundwater. Eleven projects have been constructed, and another has been planned and is ready to be constructed. Nine projects, including 3 impoundments and 40 miles of watercourse channels, have been constructed by the TRWD. Many of these projects also include components to protect, improve or enhance water quality, aquatic and terrestrial habitat, and water quantity/supply. In addition, the TRWD utilizes **Minnesota Statute 103E (the Drainage Code)** to maintain 73 miles of legal drainage ditches. These ditches are primarily used for agricultural purposes but also serve as outlets for some city sanitary and storm sewers.

Several other MN statutes govern some of the work of the TRWD. These include 103F (Buffer Law), 13D (Open Meeting Law), and 471.345 (Uniform Municipal Contracting Law). Numerous other pertinent laws, statutes, and rules within the State of Minnesota also govern activities of the TRWD.

Two Rivers Watershed District Mission Statement:

It is the stated mission of the Board of Managers of the Two Rivers Watershed District ***to carry out all facets of the Minnesota Watershed Act as set forth in Minnesota Statute, Chapter 103D. It is the District's further mission to carry forth all activities and powers given under the Minnesota Drainage Code in Minnesota Statute, Chapter 103E. In carrying out its mission, the District will encourage the wise use of the water & aquatic natural resources within its boundaries and promote the general health and welfare of the citizens residing there.***

Associations:

The TRWD is a member of the Red River Watershed Management Board (RRWMB) and MN Watersheds. As a member of these organizations, the TRWD is affiliated with several other regional organizations including the Red River Retention Authority (RRRA), the Red River Basin Commission (RRBC), the International Water Institute (IWI), and the Red River Flood Damage Reduction Work Group (FDRWG). These various organizations work diligently in the areas of research and development, watershed education, advocacy, planning and permitting, and funding of projects and programs.

Citizen's & Technical Advisory Committees:

According to MN Statute 103D.331, the Board of Managers annually appoints both a citizen's (CAC) and a technical advisory committee (TAC) to advise and assist the managers on all matters affecting the interests of the watershed district and make recommendations to the managers on all contemplated projects and improvements in the watershed district. The Committees are to meet at least once per year and more frequently on an as needed basis.

The advisory committees generally consist of at least five members. If practicable, the advisory committee members selected should include a representative from each soil and water conservation district, a representative of each county, a member of a sporting organization, a member of a farm organization, and a representative of each federally recognized Tribal government within the watershed district. Other advisory committee members may be appointed at the discretion of the managers. The members must be residents of the watershed district, except representatives from Tribal nations, soil and water conservation districts, and counties, and serve at the pleasure of the managers.

In addition, the managers may appoint other interested and technical persons who may or may not reside within the watershed district to serve at the pleasure of the managers.

In 2026, as of the writing of this plan, there were 30 individuals appointed to the Citizen's Advisory Committee, representing townships, agricultural organizations, rural citizens and landowners, county commissioners, city mayors, county SWCD's, the Friends of Lake Bronson State Park, and other local organizations. A Technical Advisory Committee is also established, consisting of 16 staff employees representing MN DNR, MPCA, BWSR, county highway departments, SWCD's, environmental/conservation organizations, county zoning, county emergency management, NRCS, and others interested.

Watershed District Description

The land area of the TRWD encompasses 1,454 square miles. The boundary does not follow political boundaries, rather it follows drainage boundaries. The TRWD stretches 65 miles from the Red River on the western boundary to the eastern boundary located between the cities of Badger & Roseau. At its widest north-south point, the

TRWD stretches 33 miles. It is bordered to the north-west by the Joe River Watershed District; the north by the Province of Manitoba, Canada; the east by the Roseau River Watershed District; the south by the Middle-Snake-Tamarac Rivers Watershed District; and to the west by the Red River of the North, which is also the boundary with North Dakota.

A general map of the TRWD is shown in figure 1.0. The TRWD is located within parts of the political jurisdictions of Kittson, Roseau and Marshall Counties and also the Soil and Water Conservation Districts for these counties. There are 10 cities and all or parts of 55 townships within its boundary. Information on many of these jurisdictions can be found at the following websites: <https://www.nwrdc.org/counties-served> <https://www.maswcd.org/find-your-swcd>

The Two Rivers actually consists of three branches – the North, Middle and South Branch which come together and jointly outlet into the Red River of the North approximately 11 miles west and 2 miles north from the City of Hallock. Also within the area of the TRWD is a stand-alone separate system consisting of a number of drainage ditch systems and a natural coulee system. This ‘unnamed coulee’ and ditch system similarly come together and jointly outlet into the Red River of the North approximately 7 miles south and 7 miles west from the City of Hallock.

The **South Branch** Two Rivers arises southeast of Badger, Minnesota and flows in a southwesterly direction, through Greenbush, along the south side of MN Highway 11 until it reaches the Roseau and Kittson County line. It then turns northwesterly, flowing through Lake Bronson and Hallock where it joins the Middle Branch.

The **Middle Branch** Two Rivers drainage area begins east of the Kittson & Roseau County line, travels through the central portion of Kittson County, and outlets into the South Branch just east of the city of Hallock.

The **North Branch** Two Rivers drainage area begins in northwestern Roseau County, flows westerly through Lancaster and Northcote, and joins the South Branch to form the main stem Two Rivers about three miles east of its outlet into the Red River.

The southwest portion of the TRWD is a 360 square mile **stand-alone unnamed coulee system** that was added to the TRWD’s jurisdiction in the mid 1980’s. This drainage system is comprised of a series of coulees which outlet into legal drainage systems. These legal drainage systems then outlet into a series of coulee systems, which then outlet into the Red River. Cities within this area include Halma and Karlstad in the east and Kennedy and Donaldson in the west.

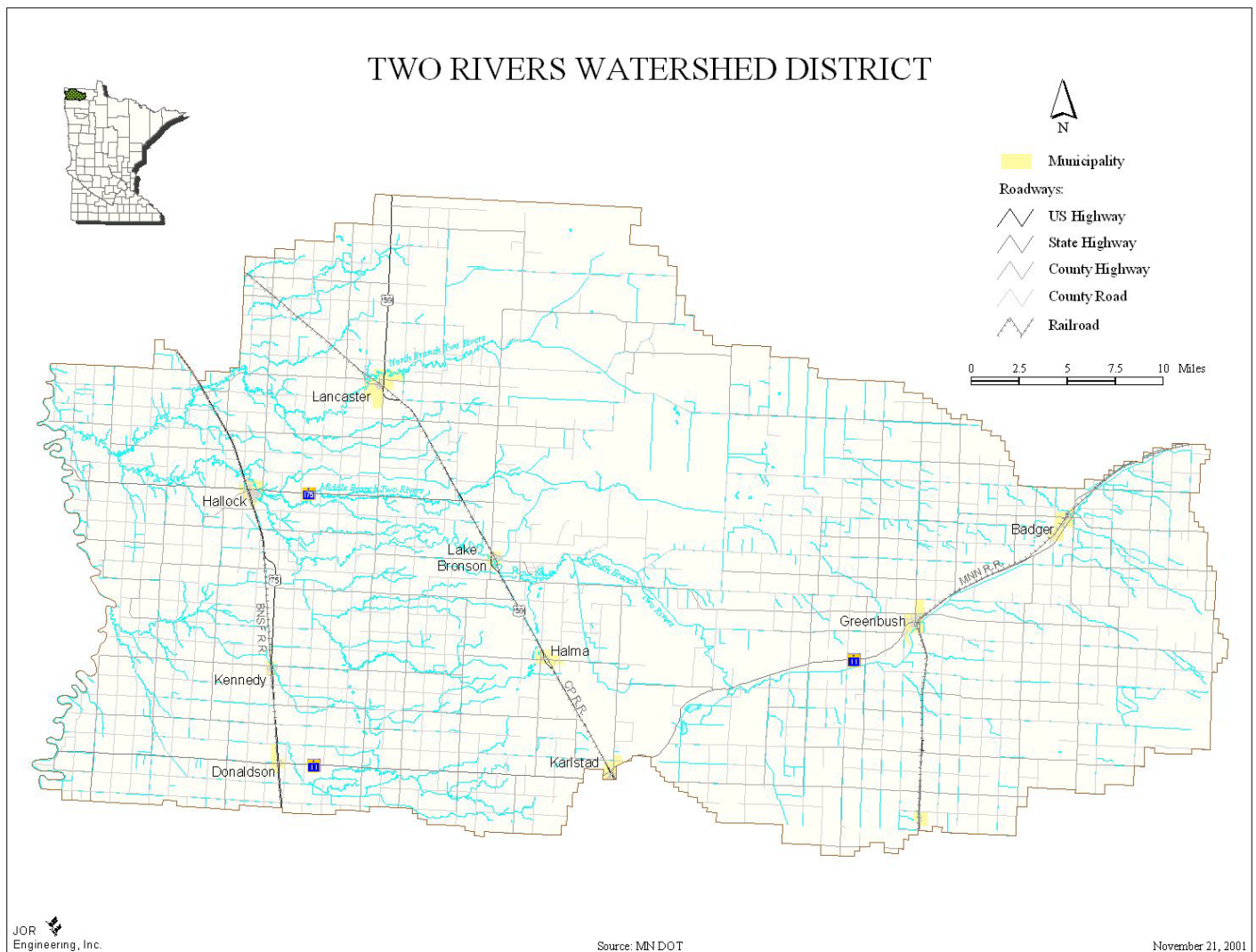


Figure 1.0

Population

Table 1 at the right shows population statistics from 1970 to 2020 for Kittson & Roseau Counties and the cities within the TRWD. This information was obtained from the US Census Bureau's

City / County	1970	1980	1990	2000	2010	2020
Roseau	11569	12574	15026	16338	15629	15331
Badger	327	320	378	470	375	429
Greenbush	787	817	790	784	719	682
Strathcona	31	47	34	29	44	25
Kittson	6853	6672	5767	5285	4552	4207
Donaldson	69	84	55	41	42	20
Hallock	1477	1405	1350	1196	981	906
Halma	96	97	59	78	61	58
Karlstad	727	934	910	794	760	710
Kennedy	424	405	324	255	193	176
Lake Bronson	325	298	262	246	229	178
Lancaster	382	268	337	363	340	364

website: <https://data.census.gov/>

Population within the TRWD continues a slow decline. Agriculture remains the primary economic driver in the area.

Physical & Other Features

When planning watershed projects and programs to address things like flooding, drainage, water quality and habitat, it is important to look at data and analysis of the physical and natural features that are present in the area. These features influence the volume, timing, velocity, and other characteristics of precipitation and runoff which determine water quantity and quality.

Many of the physical and man-made features like land use, soils, habitat, groundwater, and major watercourses within the TRWD are described in several other written reports that are readily available. Therefore, this plan will not go into great detail but instead some of these other sources are mentioned below.

The MN DNR prepared a “Watershed Context Report” for the Two Rivers in September 2017 and this is available at the following website:

<https://wrl.mnpals.net/islandora/object/WRLrepository%3A3360>

Although this report does not include the JD 10 and Unnamed coulee subwatersheds, it does give an accurate account of the watershed setting. It includes data a maps referring to the physical characteristics, landscape alterations, and human aspects.

Similarly, the USDA-NRCS prepared a “Rapid Watershed Assessment” for the Two Rivers around 2007. This document is available upon request. It is valuable in that it “provides initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. The assessments can help landowners and local leaders set priorities and determine the best actions to achieve their goals”. This document details land use, stream flow-riparian-crop-pasture information, common resource areas, farmland classification, soils, threatened and endangered species and socio-economic data.

Another document that discusses the watershed setting is the “Two Rivers Plus One Watershed One Plan” prepared jointly by Kittson and Roseau Counties and the Kittson and Roseau Soil & Water Conservation Districts. This document is available at the following website: <https://www.tworiversplusjpb.org/the-plan>

The MN Pollution Control Agency has performed monitoring and assessments within the Two Rivers Watershed District on a 10 year cycle. Two “Watershed Restoration and Protection Reports”, or WRAPS, are available for areas within the Two Rivers Watershed. The reports for the Two Rivers is at this website:

<https://www.pca.state.mn.us/watershed-information/two-rivers>

The reports for the JD 10 and Unnamed Coulee subwatersheds can be found here: <https://www.pca.state.mn.us/watershed-information/lower-red-river-red-river-of-the-north-tamarac-river>

Hydrologic Trends

Hydrology is obviously important in watershed planning. Not just the amounts of precipitation is an important factor, but also the intensity, timing, duration and location all can have drastic effects on how water moves through each subwatershed. When looking at problems and issues and considering goals and objectives, it is important to consider short and long term trends in precipitation and flow.

The information below is from the ‘Overview’ section of the following document citation: *Minnesota Department of Natural Resources. 2023. Evaluation of Hydrologic Change (EHC) Technical Summary: Two Rivers Watershed*. It is available at the following website: <https://wrl.mnpals.net/node/4102>

This is one tool that can be used to help evaluate and plan for projects and programs.

Overview - from Two Rivers EHC

Hydrologic change, or *alteration*, is a complex and dynamic concept affecting multiple water management aspects and watershed health. It is defined as “significant changes in the magnitude, duration, timing, frequency or rate-of-change of natural stream flows” (American Rivers 2017). Minnesota has experienced widespread changes in hydrology, often expressed as higher stream flow (Minnesota DNR 2020). These changes are known to affect stream channel stability, aquatic habitats, and water quality, and can also impact adjacent infrastructure and agricultural lands.

This summary provides an overview of changes in hydrologic conditions in the Two Rivers Watershed. The summary is based on a set of peer-reviewed tools and analyses selected by the Minnesota Department of Natural Resources (DNR) and developed into a standardized assessment called the *Evaluation of Hydrologic Change (EHC)*.

The EHC uses historical streamflow, precipitation, and other records over a period of at least 30 years to characterize hydrology in the watershed. Daily, monthly and annual data are assessed and compared before and after an identified point of greatest hydrologic change.

The summary specifically includes the following:

- The key hydrologic changes identified for this watershed
- An overview of critical concepts in the EHC and the data used to assess hydrologic change
- A review of the multiple tests used to identify the point of greatest hydrologic change
- An assessment of hydrologic data compared to other watersheds regionally and statewide

- A comparison of selected hydrologic metrics before and after the identified change point for each gage assessed, and associated levels of concern about watershed impacts
- An assessment of the influence of hydrologic drivers on discharge in this watershed

Generally, the EHC for the Two Rivers indicated that around 1992 there was a significant change in precipitation, which has led from moderate to extreme increases in all types streamflows in most cases. The table below from the report indicates water balance conditions prior to 1992 and compares them to post 1992.

Water Balance Table

What does it tell us?

The water balance table (**Table 5**) quantifies changes in the relationship between precipitation and discharge. The table compares the volume of water entering and exiting the watershed before and after the change point. Small changes in precipitation (P) or evapotranspiration (ET) can have significant effects on discharge (D). Comparing changes in discharge and precipitation can help determine the capacity of the watershed to store additional water.

How it works

The water balance table is populated by averaging annual volumes of discharge and precipitation before and after the change point. The difference between the discharge and precipitation values for each period is identified as evapotranspiration. Changes in water storage are assumed to be negligible over the span of many years and are not included in the water balance. Each hydrologic component in the budget equation is normalized by converting volume units to inches over the gage watershed to enable direct comparisons.

Change Point = 1992	<u>D</u>ischarge (in.)	ET (in.)	<u>P</u>recip (in.)	Runoff Ratio (<u>D</u>/<u>P</u>)
Pre 1992	2.4	17.5	19.9	0.12
Post 1992	4.5	19.7	24.2	0.19
Change	2.2	2.1	4.3	0.07

Table 5. Water balance (in inches over the watershed) for the South Branch Two Rivers at Lake Bronson (05094000)

In short, over the past 30 years average annual precipitation has increased in the watershed by 4.3 inches from what it was prior to 1992 - resulting in more runoff in many instances. This potentially affects flooding, erosion, damages to infrastructure, water quality and most all aspects of water management. More information about the EHC is available on the DNR website. The website provides access to EHC Technical Summaries for all watersheds assessed in 2020 and a statewide map and list of the U.S. Geological Survey (USGS) gages analyzed in those watersheds.

Prime Farmland –

Agriculture is the primary economic driver of the region. The vast majority of land within the area of the TRWD is either cropped, hayed, pastured, or in some sort of a conservation easement. The map in Figure 2.0 below uses information from the NRCS soil survey to show farmland class and capability for soils. Because of the farmland status, surface drainage ditches and increasingly sub-surface tile systems have efficiently drained the landscape in order to optimize ag production. Watershed planning efforts past, present and future aim to manage systems to allow for agricultural drainage but at the same time prevent flooding, erosion and sedimentation. The key is to strike a balance that is acceptable for all interests.

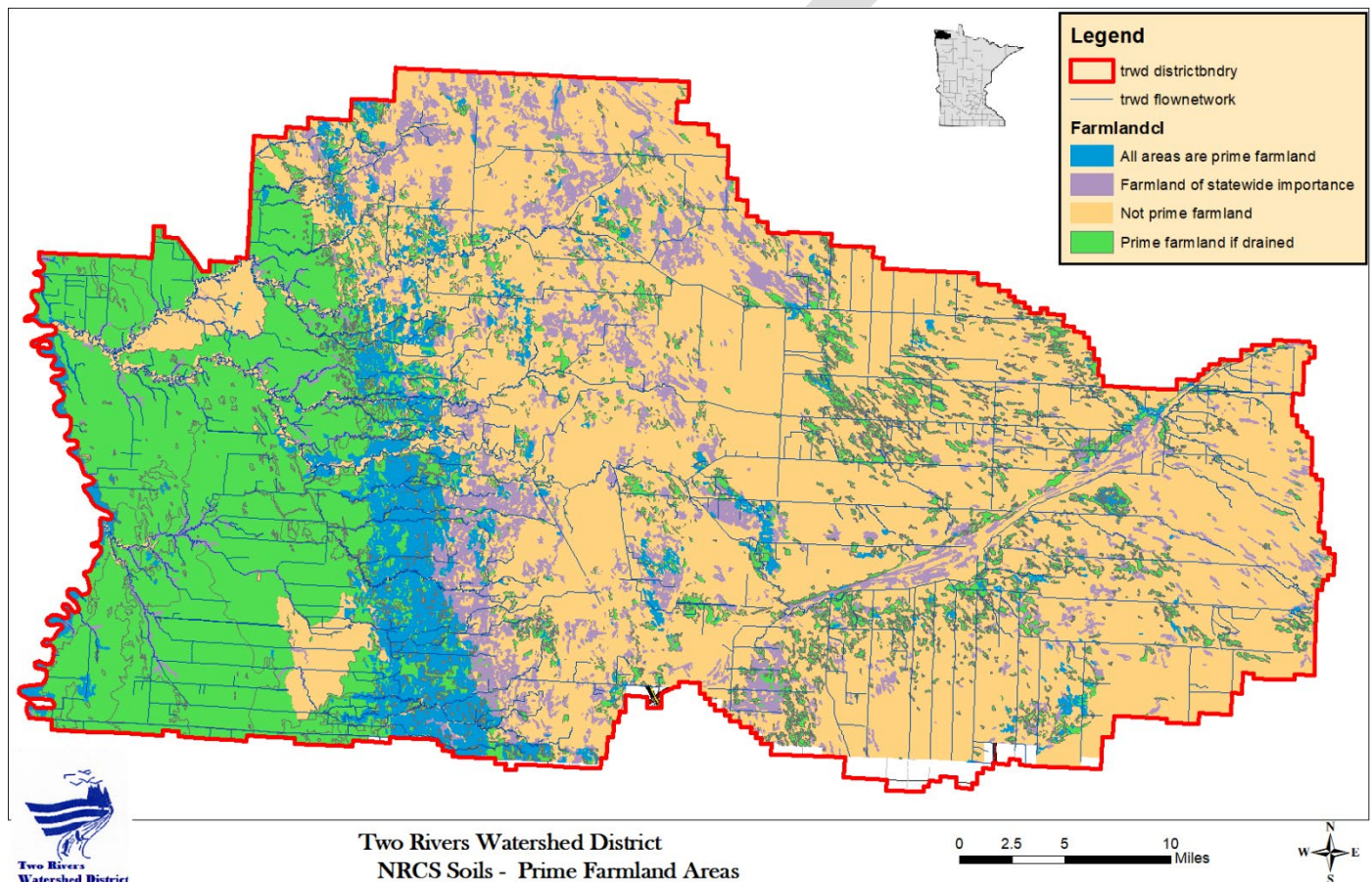


Figure 2.0

Elevation & Slope

The land in the TRWD is essentially very flat. The land in the western part, and particularly from about U.S. Highway 59 to the Red River generally has rich soil and is flat, open land devoted primarily to the raising of small grains, sugar beets, sunflowers, soybeans, canola, and other crops. From U.S. Highway 59 to the east soil is sand and loam, the land is not as flat and there is more brush and tree growth. Because of

steeper slopes, sandier soils, and other factors, this area of the District has more pasture, hay and conservation areas interspersed with cropland.

In the eastern portion of the watershed the fall is toward the west. The fall is quite rapid and as much as twelve to fifteen feet per mile. Some portions of the District, associated with beach ridges, experience 20 to 30 feet per mile drop. In the westerly twelve to fifteen miles of the watershed the lands are flat and the drop is not more than one or two feet to the mile.

Although the countryside appears flat in the watershed, there is a considerable difference in elevation between the headwaters and the mouth of the Two Rivers. In general, there is a 420 foot drop from the highest point in the District to the lowest point. The Lidar map in Figure 3.0 below depicts the elevation difference across the TRWD.

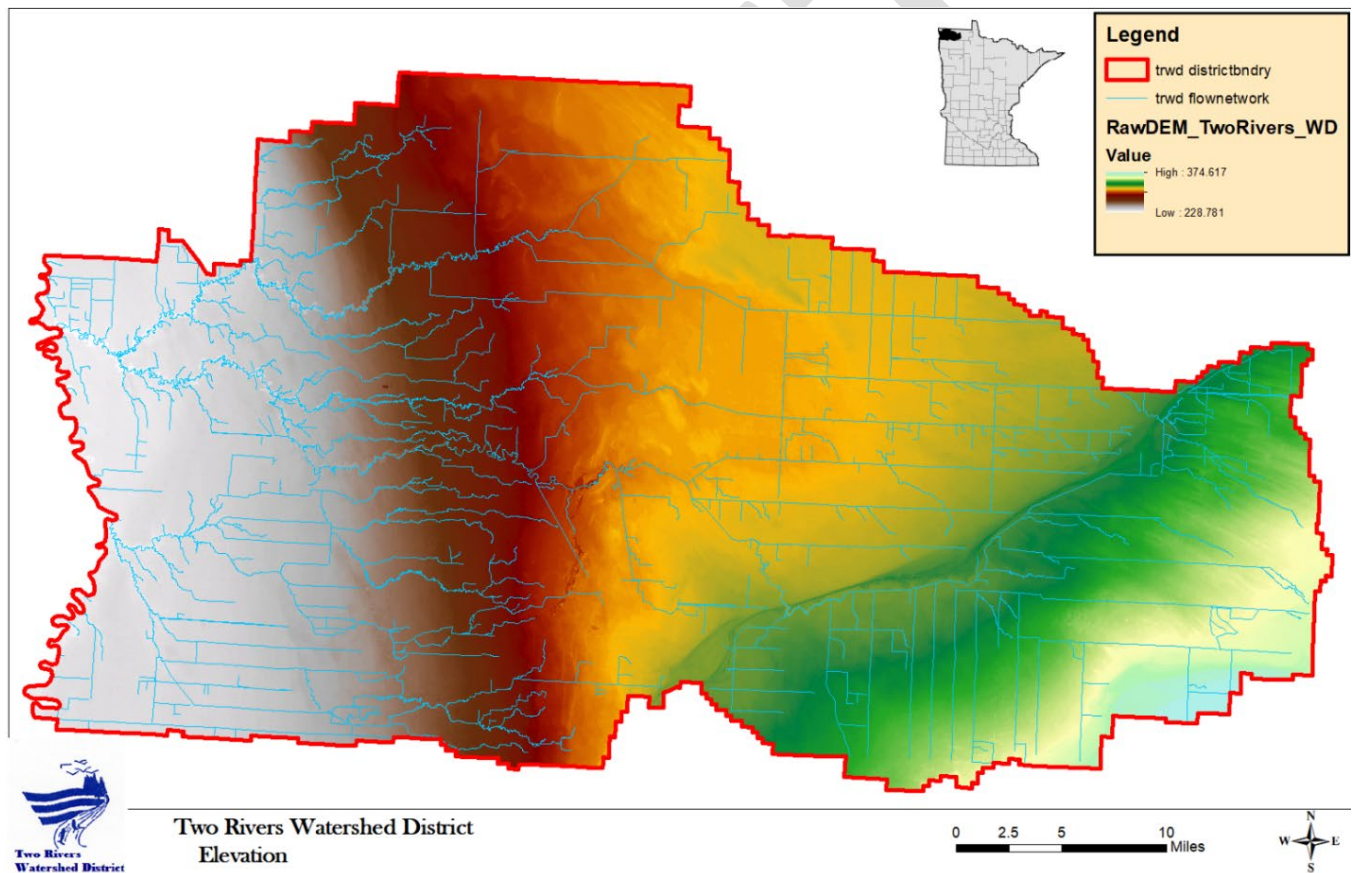


Figure 3.0

Description of Issues

Considerations For Decision Making Regarding Water Management Within the Two Rivers Watershed District.

Water management activities of the Two Rivers Watershed District in the past 25 years have generally focused on two core categories. These can be characterized as either “Flood Damage Reduction” (FDR), or “Natural Resources Enhancement” (NRE). For the purposes and mission of the Two Rivers Watershed District, FDR can further be broken into the categories of flooding and drainage, while NRE can be broken into water quality and habitat.

Flood Damage Reduction (FDR)

Flooding – Flooding has been a major issue within the TRWD in the past and continues to cause problems for residents, cities, public infrastructure and private farmland. Since 1993 there have been 15 Presidential disaster declarations for flooding within Kittson County and a similar amount in Roseau County. In addition to the federal declarations, there have been numerous events that have triggered State of Minnesota disaster funding.

Numerous studies have been conducted within the Red River valley because of the serious and extreme nature of these re-occurring flood events. The Red River Basin Commission, an international organization based in Moorhead MN, has prepared a Long Term Flood Solutions (LTFS) document for the Red River. It encompasses strategies for North Dakota, Minnesota, and Manitoba.

As a result of the LTFS process, a basin wide goal of reducing the peak flooding on the Red River by 20% has become a generally accepted goal. Storage of floodwater by detaining it within impoundment areas during a flood and then releasing it after flooding has subsided was one of the recommendations. Detailed engineering and modelling were used to compute how much storage was needed to be constructed within each tributary. For the Two Rivers under this goal, between 40,000 and 50,000 acre feet of storage are needed to meet the goal. The TRWD currently has constructed over 9,000 acre feet toward meeting this goal and has another 35,000 acre feet planned.

County all hazard mitigation plans have been prepared for Roseau, Kittson and Marshall counties. These plans identify various hazards such as storms, fire, and flooding and discuss the risk of each. For all counties within the TRWD, flooding is ranked as a high risk. Strategies for reducing flooding and flood damages are a high priority. Figure 4.0 below is from the Kittson County Hazard Mitigation Plan and shows potential impacts from a 100 year flood event.

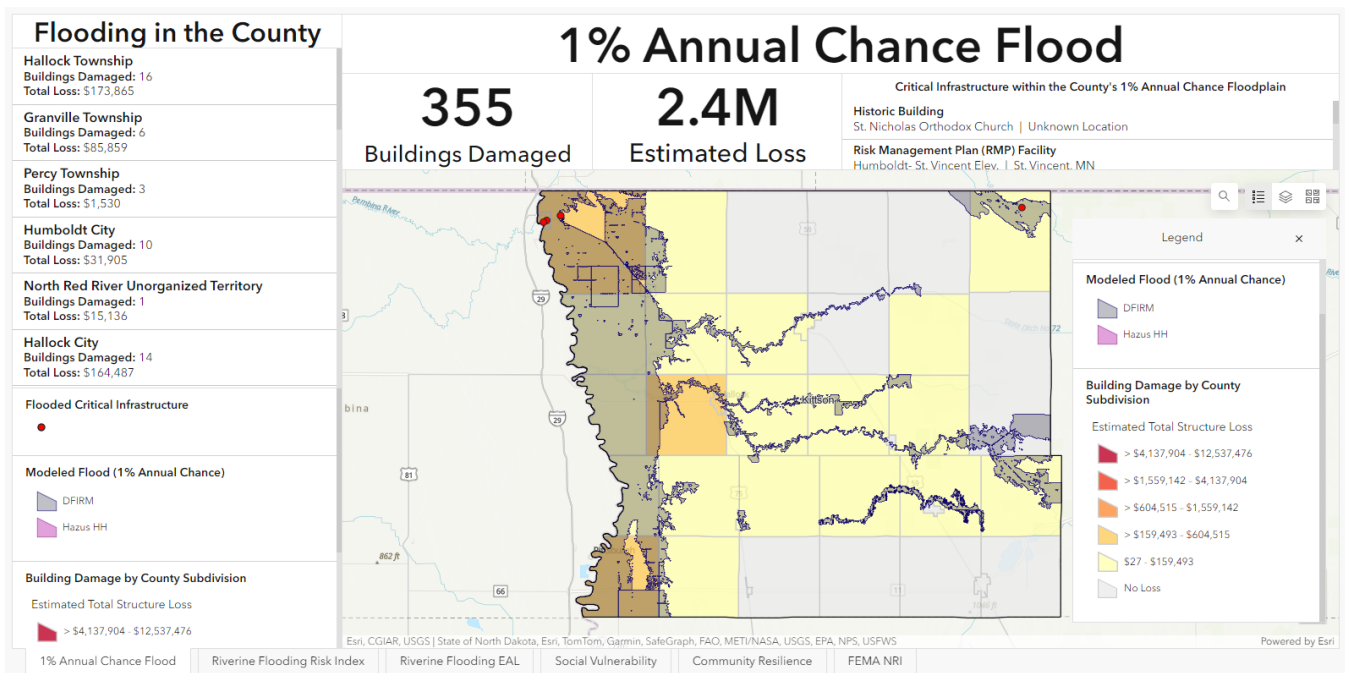


Figure 4.0: From: Kittson County Hazard Mitigation Plan, U-Spatial: <https://kittson-county-hmp-umn.hub.arcgis.com/pages/flooding>

A similar map and information for Roseau County can be found at this link: <https://roseau-county-hmp-umn.hub.arcgis.com/pages/flooding>

Figure 5.0 below shows areas that were examined for potentially storing and detaining flood water. It looked at existing areas that are currently controlled by an impoundment and other areas that could potentially be controlled. The results of this flow reduction strategy indicated that the 20% goal for flow reduction is feasible and achievable for the TRWD.

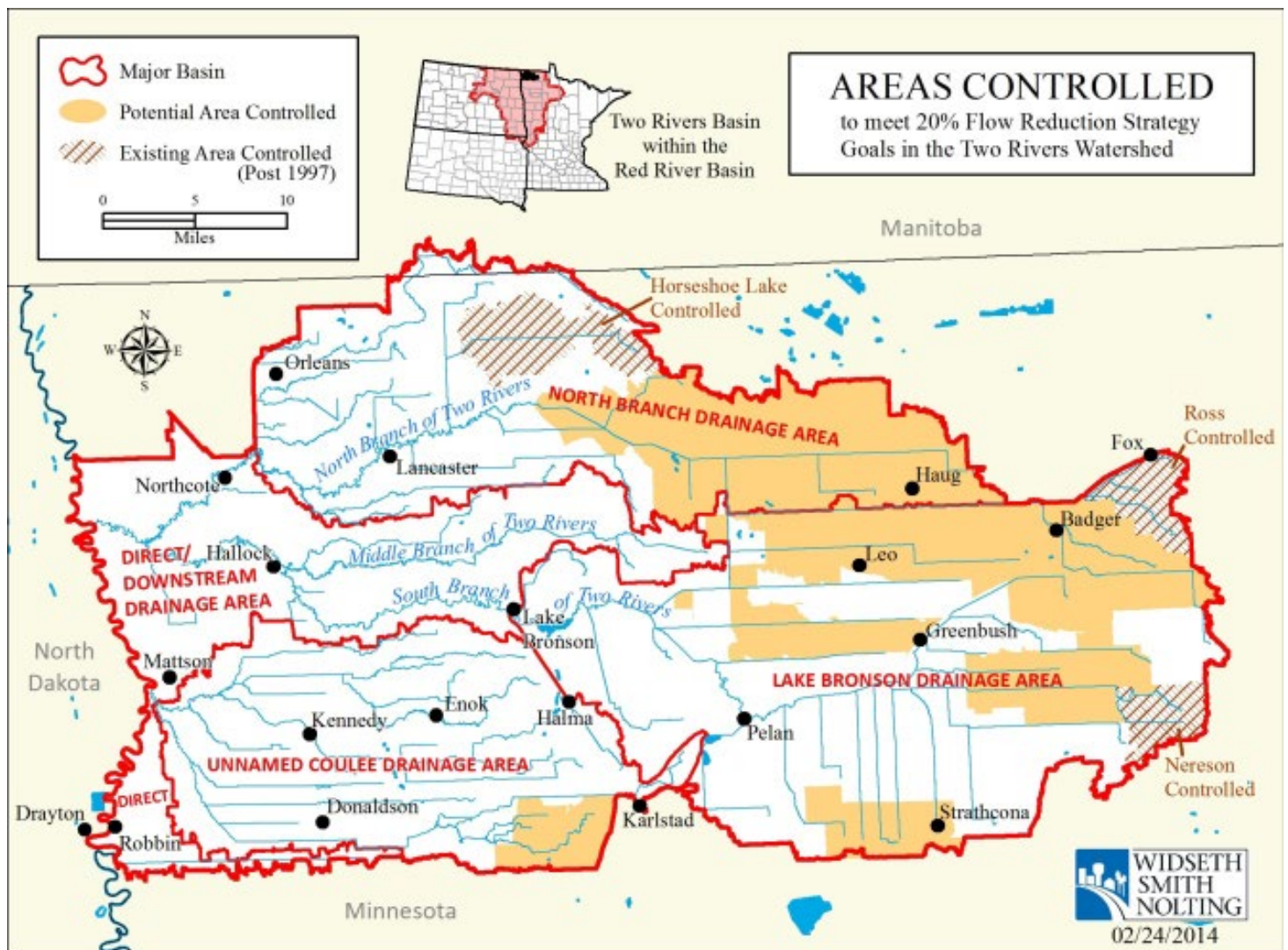


FIGURE 5.0

1998 MEDIATION AGREEMENT

Another flood related initiative in the Red River valley is the mediation agreement that is coordinated by the Red River Basin Flood Damage Reduction Work Group (FDRWG). The FDRWG is made up of representatives of federal, state and local water management agencies along with local citizens, landowners, and non-government agencies who have a conservation/environmental focus. This agreement was brought about by disagreements between state and federal agencies and local watershed districts that are members of the Red River Watershed Management Board. In the 1980's and 1990's there were disagreements over proposed flood impoundment. The arguments centered around potential negative environmental impacts resulting from the construction of projects and required permits for those projects. In 1998 the two sides came to a historic agreement so that these types of projects would be planned out to minimize negative impacts and to consider benefits not only for flood damage reduction but also to enhance natural resources.

Detailed information regarding the agreement and the work of the FDRWG along with links to the document(s) can be found at this link: <https://www.rrwmb.us/fdrwg>

The following is an excerpt from the agreement:

This agreement is the product of eight months of consensus-based, mediated negotiations by the Red River Basin Flood Damage Reduction Work Group (“Work Group”). It responds to a mandate from the Minnesota Legislature to resolve gridlock over state permitting flood damage reduction projects in the Red River Basin. The agreement is intended as the framework for a new, collaborative approach to implementing both flood damage reduction and natural resource protection and enhancement in the Red River Basin in ways that will benefit all Minnesota’s citizens. The keys to this new approach are clearly identified goals, comprehensive watershed planning, early consultation and collaboration on flood damage reduction projects among stakeholders, and a cooperative approach to permitting of those projects.

Definition of Early, Middle, and Late Areas Relative to the Red River Main Stem

Main Stem

This map identifies early, middle, and late runoff areas within the Red River basin relative to the main stem at the Canadian border. This generalized map was based on the evaluations of historical flood hydrographs, knowledge of more recent floods, and computed runoff travel times. This map can be used to help define which types of Flood Damage Reduction (FDR) measures to use in different areas of the basin to help reduce peak flows on the

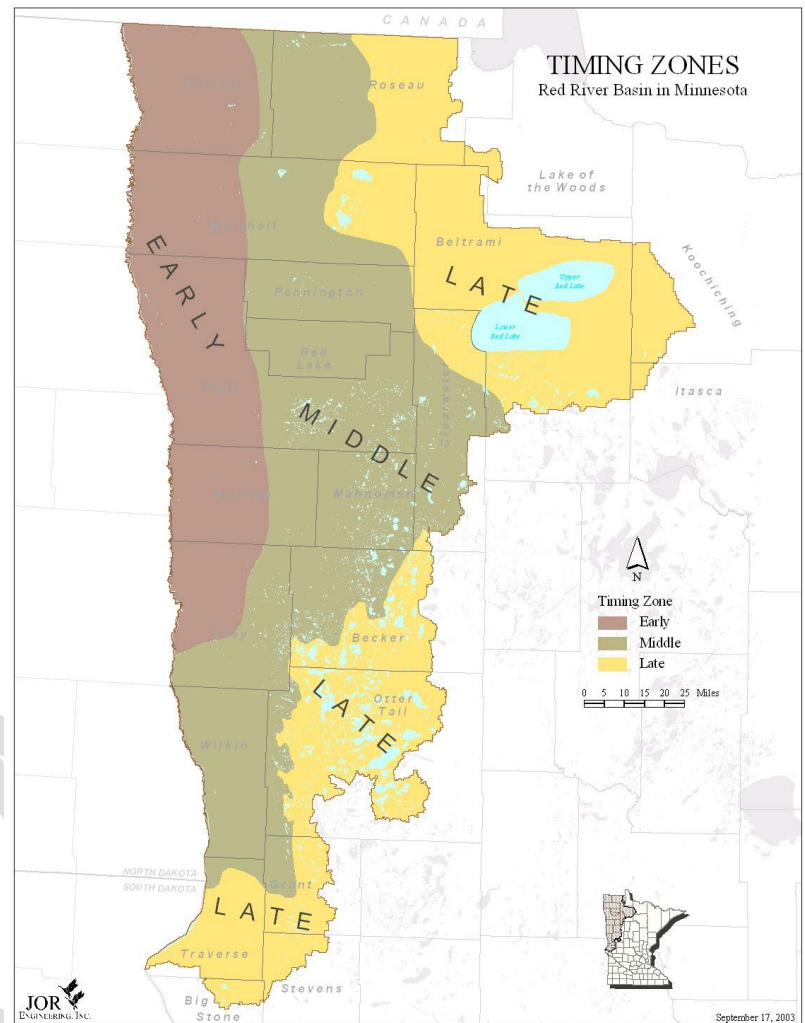


Figure 6.0

Red River main

stem, while also achieving local and watershed FDR goals. The lines between early, middle, and late areas are not exact. For example, smaller late areas may exist within the identified middle area. Therefore, this map should be used in conjunction with local knowledge of runoff timing.

The mediation agreement identifies the following broad based goals for flood damage reduction:

- 1) prevent loss of human life,
- 2) prevent damage to farm structures, homes & communities,
- 3) reduce damage to farmland,
- 4) reduce damage to transportation,
- 5) reduce damage to water quality from floodwaters coming into contact with contaminants,
- 6) reduce environmental damage caused by flood control projects,
- 7) reduce social and economic damage, and

8) reduce damage caused by flooding to natural resource systems.

The agreement also identifies natural resource enhancement goals, which are discussed later in this document.

Using various studies, models and information, several types of projects have been identified that can provide flood damage reduction benefits. These include projects that

- 1) Reduce Flood Volumes,
- 2) Increase Conveyance Capacity,
- 3) Increase Temporary Flood Storage, or
- 4) Provide Protection or Avoidance from flooding.

Many factors go into planning the type of project to construct, including where in the watershed a project is proposed to be located, the size of the area that is to be protected, the hydrologic and geologic features of the area, population and socio-economic factors.

The TRWD has constructed numerous projects to address flooding problems across the District, these include channel conveyance projects with setback levees, individual farmstead ring dikes to provide protection, impoundments to store floodwater, and ditching/diversion channels. The 'Flood Zones and Watershed Projects' map in Figure 7.0 depicts the TRWD's constructed and proposed impoundment projects, ditch systems it manages under Minnesota's ditch law, ring dikes built to protect farmsteads, and channel conveyance projects managed under Minnesota's watershed law. The map also shows their location with regard to FEMA's flood zones. When strategically located, these projects can be of great value in preventing flood damages.

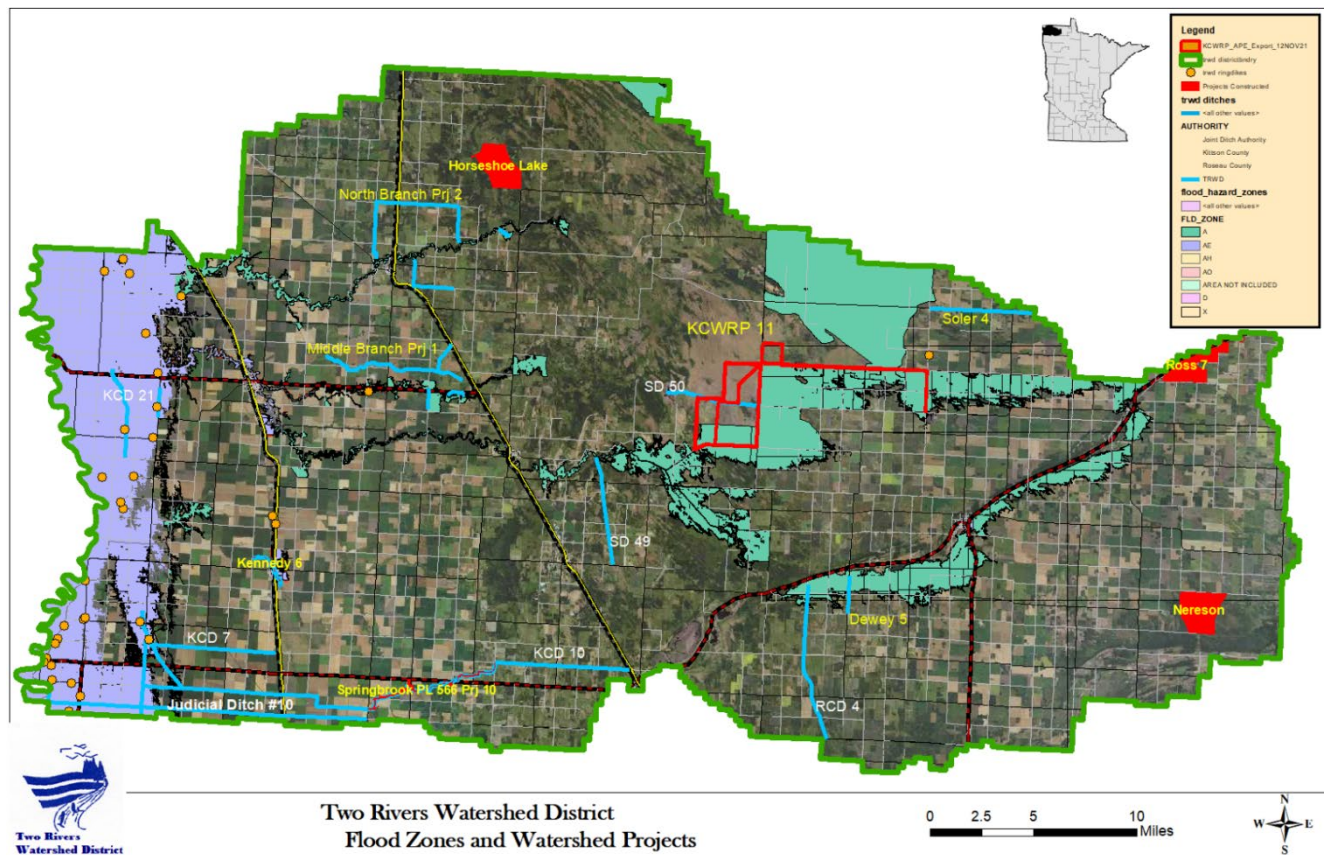


Figure 7.0

Drainage

Because of the area's farming economy, drainage within the TRWD is an important feature. Proper drainage increases crop productivity by removing excess water from the landscape and preventing crops from drowning out after large rain events. If properly planned, designed and constructed, drainage systems can not only provide agricultural benefits but also address water quality and habitat concerns. "Legal" drainage systems are those that were established under Minnesota's drainage laws, have a name and a number, and are either designated as a 'state ditch', a 'judicial ditch', a 'county ditch' or a 'watershed district' ditch. The vast majority of these ditches were established in the early 1900's when the land was first being settled and broken into farmland.

Historically these ditches were established, managed and maintained by the state, the court system, or counties. In the mid 1950's watershed districts were beginning to be established and the state of Minnesota and its judicial system began to get out of the drainage world. Today all legal ditches are operated and maintained by a 'drainage authority' which is either a county or a watershed district. The TRWD is the drainage authority for 9 systems along 73 miles of ditch. The TRWD also maintains 6 other watershed projects along 39 more miles, for a total of 112 miles of channel. Minnesota's drainage law governs how these legal ditches are managed, maintained, or modified and also pertains to new ditches.

Figure 8.0 depicts all of the drainage ditches within the TRWD and indicates who the drainage authority is for each ditch. Drainage authorities are either the TRWD, Kittson County, Roseau County, or a Joint County Drainage Authority for ditches that are located in more than one county.

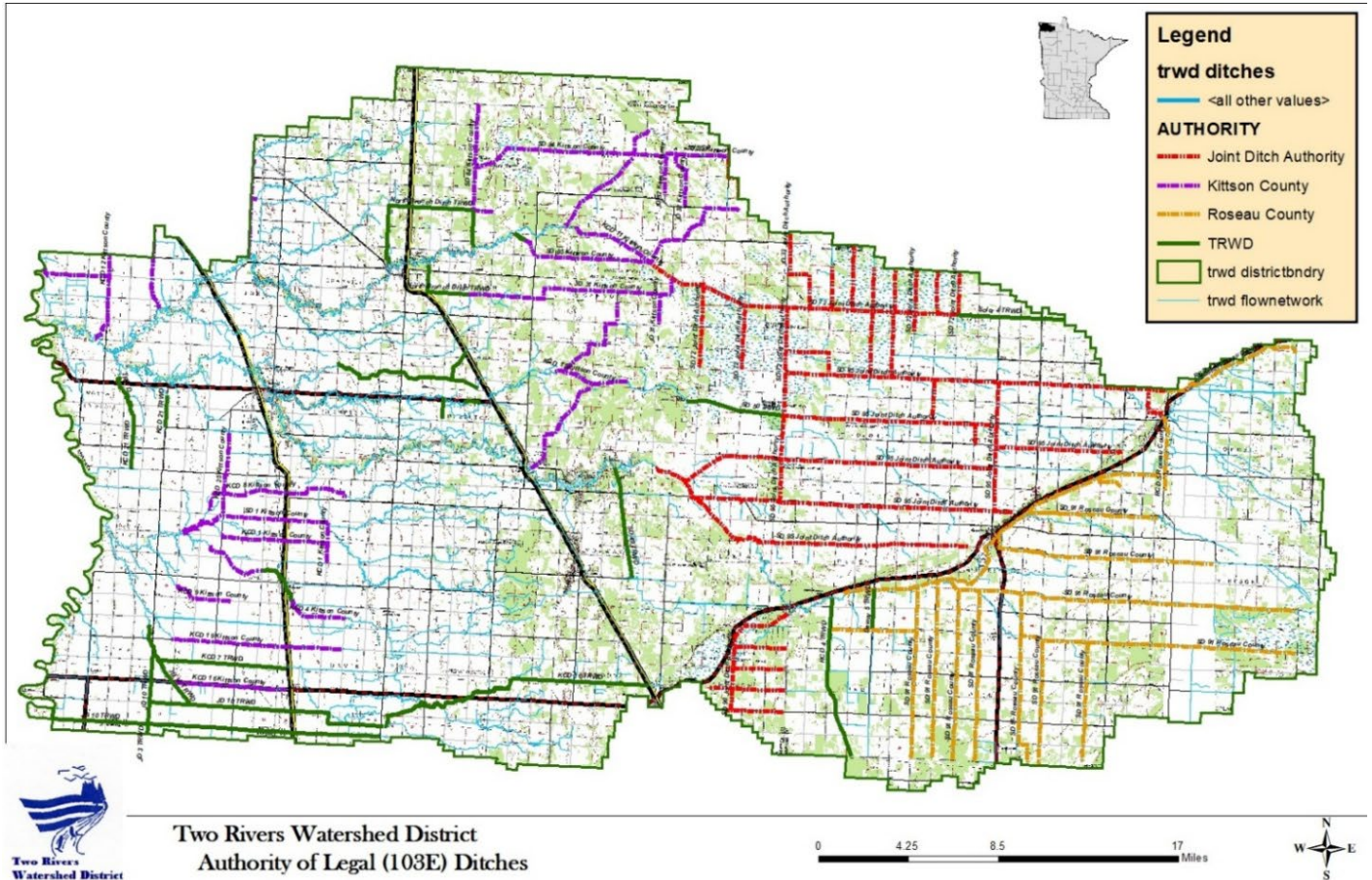


Figure 8.0

Regarding drainage, a regional goal in the Red River Valley and indicated in the regional Mediation Agreement, is to construct and maintain ditches in agricultural areas to have the capacity to manage a '10 year' runoff event. This equates to about a 3.5" to 4" rainfall in a 24 hour period and the goal is to be able to drain this runoff from adjacent cropland within a 24 to 48 hour period. This will reduce or prevent damage to crops for the most frequent rainfall events. If and when larger events occur it will result in some crop loss. The 10 year event has been widely accepted by watershed districts, state and federal agencies as compromise to enable drainage for ag productivity but at the same time prevent or reduce damages to natural resources from erosion, sedimentation, and water pollution.

Natural Resources Enhancement (NRE)

The Mediation Agreement identifies the following goals for NRE:

- 1) manage streams for natural characteristics,
- 2) enhance riparian and in-stream habitats,
- 3) provide diversity of habitats for stable populations to thrive over a long period of time,
- 4) provide connected, integrated habitat including compatible adjacent land uses,
- 5) enhance or provide seasonal flow regimes in streams for water supply, water quality, recreation, and support of biotic communities,
- 6) provide recreational opportunities,
- 7) improve water quality,
- 8) protect groundwater,
- 9) manage lakes for natural characteristics.

One tool that can be used to help achieve the above goals is the MN DNR Watershed Health Assessment Framework. According to the DNR's website, *"the Watershed Health Assessment Framework (WHAF) is an organized approach to help understand watersheds as interconnected natural systems. Using five core ecological components; Biology, Connectivity, Geomorphology, Hydrology, and Water Quality, the WHAF provides a consistent, comprehensive overview of the health of Minnesota's watersheds. The WHAF Delivers:*

- *A suite of map-based applications designed for exploration across scales*
- *Health scores calculated from spatial data and organized into five ecological components*
- *Downloadable watershed reports and data summaries*
- *Web pages with supporting system science information, references and other resources*

The WHAF is designed to foster a deeper understanding of our ecological systems by providing a platform for interactive exploration and collaboration as we seek to improve the health of our watersheds – our landscapes, our rivers and lakes, and our communities."

The following links provide watershed information and give a report card score.

Two Rivers:

https://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_70.pdf

Lower Red (JD 10 & Unnamed Coulee):

https://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_69.pdf

Water Quality

Water quality is important for natural resources not only as an indicator of the health of rivers and lakes, but also because water is used for drinking and recreation. Since 1991 the Two Rivers Watershed District has performed water quality monitoring and has established 10-12 sites where water samples are taken and various water quality parameters are measured. Parameters that are monitored include pH, dissolved oxygen, transparency/turbidity, water temperature, conductivity, nitrogen, phosphorous, total suspended solids, and E-coli (bacteria). The data collected is entered into a database and used to help assess rivers, coulees, ditches and their tributaries.

The MN Pollution Control Agency (MPCA) began an intensive monitoring and assessment program in 2014. The initiative is to sample watersheds within the state for a 2 year period and do this once every 10 years. The second cycle of this was completed in 2025 for the Two Rivers. MPCA coordinates with the TRWD, SWCD's and other local agencies in this endeavor. Water bodies are then classified into one of 7 "use classes"

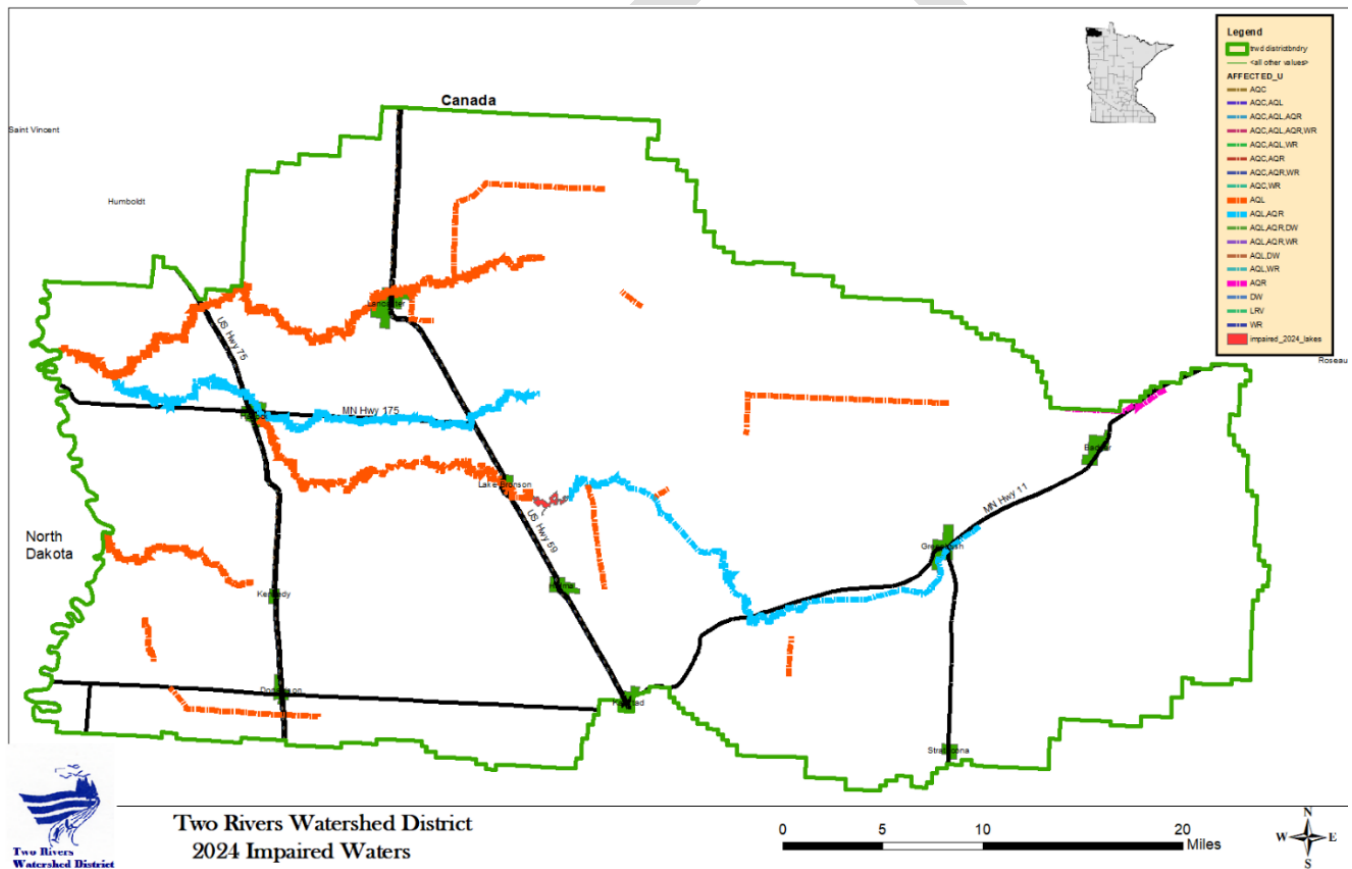


Figure 9.0

according to MN statute. They are then assessed against water quality standards set by state and federal guidelines. Once this is done, the MPCA publishes an ‘impaired waters list’ for each watershed in the state. The map (Figure 9.0) above shows the impaired waters within the Two Rivers Watershed District as identified in 2024. This list/map is periodically updated by the MPCA.

The MPCA has also written a series of reports known as 'Watershed Restoration and Protection Strategies' (WRAPS), monitoring and assessments, and stressor identification for each watershed. For the TRWD, these reports and other information can be found at the following links:

<https://www.pca.state.mn.us/watershed-information/two-rivers>

<https://www.pca.state.mn.us/watershed-information/lower-red-river-red-river-of-the-north-tamarac-river>

All of the data and information that is collected is available and is used by TRWD when planning, designing and constructing projects and also when considering various programs and cost share assistance.

Habitat

Although agriculture has a large presence within the TRWD, habitat also is an important aspect. In very general terms, about 2/3 of the area of the TRWD is agriculture and about 1/3 consists of habitat and areas managed for wildlife, either through state or private (non government) ownership or state and federal conservation easements. Notably, there are designations for existing native prairie, prairie rich fens, important bird areas, scientific and natural areas, and wildlife management for both game and non game species.

Numerous local, regional, state and federal plans have been written that address habitat management to help protect, enhance and improve habitat, wildlife populations and recreational opportunities. Plans of note include the Lake Bronson State Park plan, DNR Fisheries Management Plan for the Two Rivers, Fen Management Plan, and Prairie Plan. The map in Figure 10.0 depicts areas owned by the State of MN and managed by the MN DNR. Additionally, the Nature Conservancy owns and manages several large tracts within the watershed district.

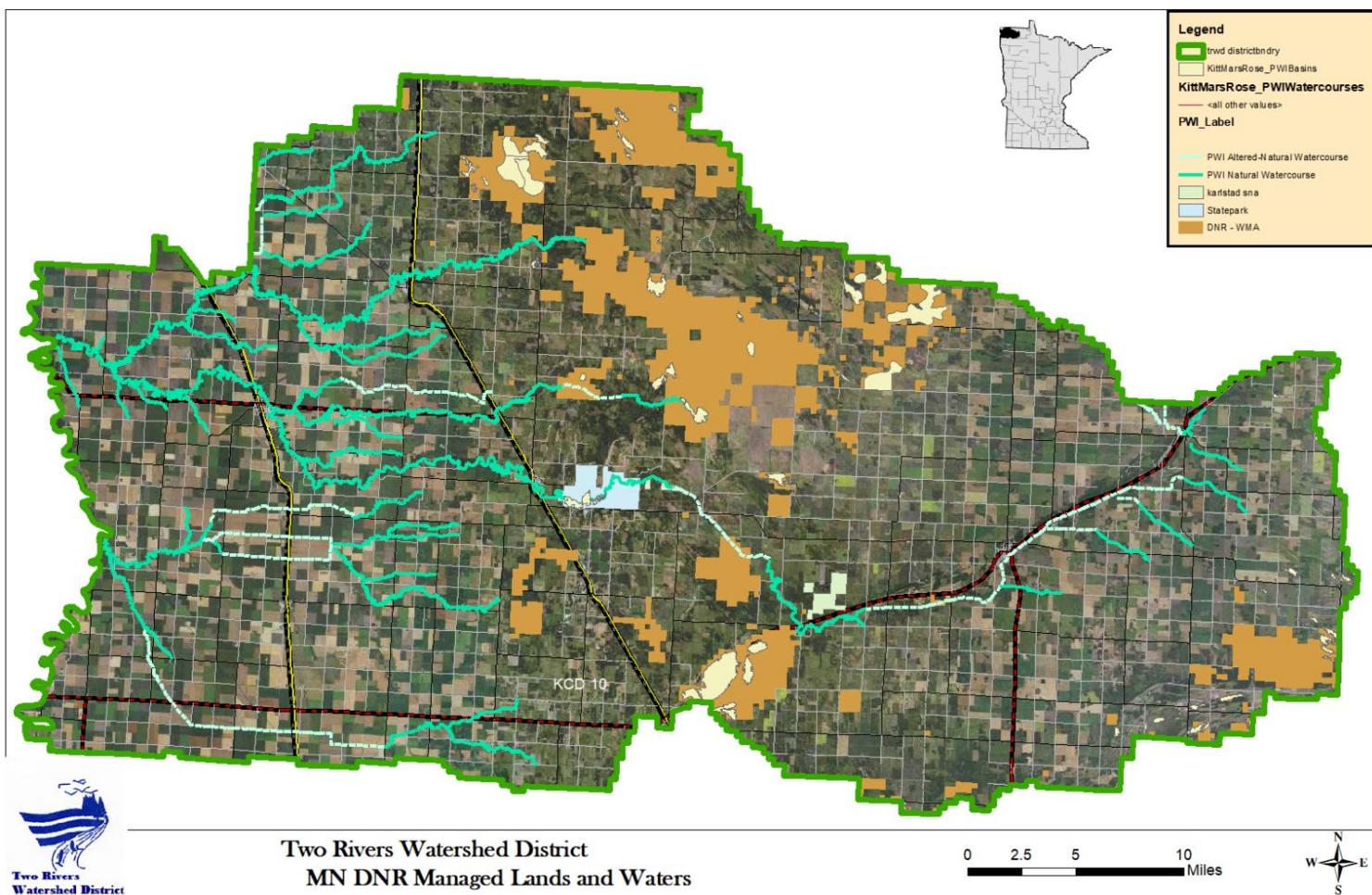


Figure 10.0

Protection of these areas is important not only for habitat, but also to reduce runoff and thereby reducing erosion and nutrient loading of rivers and waterbodies. As rainfall amounts and intensity have increased, so has erosion and sedimentation. These areas help detain water on the landscape and slow down erosion. Cost share programs funded through federal, state, and local agencies help to install best management practices that can reduce erosion and protect landscapes and public infrastructure from damages.

Quick Habitat Project: A large FDR / NRE project was undertaken by the TRWD in 2018 that restored approximately 1,500 acres to a wetland-upland complex. This area was previously farmland status, and the TRWD was able to negotiate with the former landowner to enroll the area into the NRCS's 'Wetland Reserve Program' in a 30 year easement. The TRWD performed the wetland restoration work required through the NRCS and purchased the land. The area is currently functioning as a wetland-upland-prairie complex to 1) store floodwater, 2) provide wetland functions and values, 3) provide wildlife habitat, 4) provide hunting and recreational opportunities. Future

management options for this land once the 30-year easement expires will be at the discretion of the Board of Managers.

Watershed District Purposes

Minnesota's *Watershed Law, Statute 103D*, describes the powers and duties of watershed districts. Specific purposes of a watershed district are listed as follows:

- (1) to control or alleviate damage from floodwaters to promote climate resilience;
- (2) to protect, improve, or restore watercourses and water basins for drainage, navigation, water quality, flood mitigation, and any other public purpose;
- (3) to manage impacts to, restore, or replace wet and overflowed land;
- (4) to provide a water supply for irrigation;
- (5) to regulate and conserve the flow of watercourses;
- (6) to provide or conserve water supply for domestic, industrial, recreational, agricultural, or other public use;
- (7) to provide for sanitation and public health and regulate the use of streams, ditches, or watercourses to dispose of waste;
- (8) to repair, improve, relocate, modify, consolidate, and abandon all or part of drainage systems within a watershed district;
- (9) to control or alleviate soil erosion and siltation of watercourses or water basins;
- (10) to regulate improvements by riparian property owners of the beds, banks, and shores of lakes, streams, and wetlands for preservation and beneficial public use;
- (11) to provide for hydroelectric power generation;
- (12) to protect or enhance the water quality in watercourses or water basins;
- (13) to provide for the protection of groundwater and regulate its use to preserve it for beneficial purposes; and
- (14) to otherwise manage and protect surface waters and groundwaters for any beneficial purpose.

In this and in prior planning updates, numerous water management issues have been identified which fall under the above purposes. These issues have been placed into various general categories. Goals were set and action items were identified for the TRWD to implement in order to achieve the goals. Desired outcomes were also identified, which can be used to measure progress and periodically assess the effectiveness of TRWD projects, programs, and initiatives.

The following overall goals have been identified and placed into either a Flood Damage Reduction or a Natural Resources Enhancement category.

TRWD Overall Watershed Goals, Objectives, & Desired Outcomes

During the development of this and prior *Overall Plans*, the Citizen's Advisory Committee (CAC) was convened to provide input, analyze data, and provide comment on the various aspects of the plan. Technical input is occasionally sought from a Technical Advisory Committee (TAC). Information and comments were collected, analyzed, and prioritized relative to the entire watershed district as a whole. This was done by organizing a matrix of all of the issues that were identified. The most common issues in most of the subwatersheds became a higher priority for the watershed as a whole. Those issues that were only heard in one or a few watersheds maybe would be a high priority in that subwatershed but would be a lower priority for the watershed district as a whole. The results have been organized into Flood Damage Reduction goals and Natural Resource goals and are discussed below.

A. Flood Damage Reduction

GOAL: Coordinate with other Boards the delivery of flow to the Red River.

PRIORITY ISSUE: Address spring and summer runoff events.

STRATEGIES:

- 1) Support work of the Red River Basin Flood Damage Reduction Work Group and Red River Basin Commission to identify and update "the basin strategy" and identify how much each tributary contributes to main stem Red River flooding. This will aid in identifying FDR and NRE initiatives.
- 2) The RRBC has compiled the strategy to reduce peak flows on the Red River by 20%, and each tributary is allocated the acre feet of storage needed to accomplish the goal. For the Two Rives, the contribution and timing of water reaching the Red River for the main stem Two Rivers was analyzed. Based upon this, the storage targets to accomplish flow reduction on the Red River were identified to be approximately 21,735 acre feet.
- 3) Establish water retention areas (impoundments, wetland restorations, best management practices, etc.) and set aside funding to pay landowners to promote this type of practice. Over the next 10 years, utilize the Technical Advisory and Citizen's Advisory Committees to review potential impoundment sites, identify new sites, and follow through to construction the allocated acre feet of storage.

PREFERRED OUTCOMES: Lower the peak and duration of flooding, resulting in less damage to agricultural land and public infrastructure (roads & bridges), and cities.

Specific target numbers or percentages for flow reduction will be discussed once hydrologic modeling and other factors are analyzed.

POTENTIAL PARTNERS: Landowners, Township Boards, County Boards, SWCD, FSA, RRWMB, NRCS, RRBFDWRWG, RRBC, DNR, BWSR, USGS, USACE

Flood Routing Models

Using flow routing models, the RRBC Long Term Flood Solution study was able to use the modeling information from subbasins to predict the effect that reduced flows due to additional floodwater storage sites from the tributaries would have on various points on the main stem Red River. The following table summarizes this information for the US portion of the Red River Valley. For the Two Rivers, a goal was identified to store 21,735 acre feet. The RRBC continues to work with the US Army Corps of Engineers on a federal 'Feasibility Study' to further analyze flow contributions to the Red River from all tributaries south of the international border.

20% Reduction Model	Based on WMC Mike 11 Model and tributary hydrologic models						cla	1/16/2011
Summary of Tributary Flow Reductions								
1997 Spring Flood								
	Planned by WSDs				Original Allocation			
	Peak Flow	Peak Flow	Volume	Volume	Peak Flow	Volume	Volume	
	Reduction	Reduction	Reduction	Reduction	Reduction	Reduction	Reduction	Reduction Focus
Tributarie Areas	cfs	%	%	acft	%	%	acft	
BdS R @ White Rock	1048	13%	16%	51219	20%	20%	61760	Store early water
Rabbit R @ TH 75 ung	1425	31%	39%	47639	35%	26%	24377	Peak flow reduction
BdS ungaged	0	0%	0%	0	13%	9%	12119	No reduction
Ottertail R @ Orwell	0	0	0	0	0%	0%	0	No reduction
Ottertail ung	500	13%	12%	7217	13%	12%	7217	Peak flow reduction
Wildrice ND @ Abercrombie	3150	32%	6%	23702	35%	17%	57908	Peak flow reduction
Fargo ungaged	3000	13%	13%	30433	13%	13%	30433	Store late water
Sheyenne R @ Harwood	2401	23%	11%	68395	23%	11%	68395	Peak flow reduction
Rush R @ Amenia	508	35%	13%	4324	35%	13%	4324	Peak flow reduction
Buffalo R @ Dilworth	2549	30%	17%	36091	35%	17%	38158	Peak flow reduction
Wild Rice MN @ Hendrum	2315	23%	20%	76545	35%	20%	74385	Peak flow reduction
Halstad ung	7500	13%	13%	81002	13%	13%	81002	Store late water
Goose R @ Hillsboro	2820	35%	16%	35356	35%	16%	35356	Peak flow reduction
Marsh R nr Shelly	135	3%	8%	6819	51%	18%	15247	Peak flow reduction
Sand Hill R @ Climax	43	1%	18%	19184	35%	21%	22161	Peak flow reduction
Red Lake R @ Crookston	5200	18%	8%	74830	35%	13%	119097	Peak flow reduction
RLR ung	1600	12%	10%	11427	12%	10%	11427	Store late water
GF ungaged	4400	12%	10%	32015	12%	10%	32015	Store late water
Turtle R nr Arvilla	90	10%	13%	4615	10%	13%	4615	Store late water
Forest R @ Minto	300	14%	7%	5875	14%	7%	5875	Store late water
Snake R ung	1334	24%	16%	20210	16%	15%	17128	Store late water
Middle R @ Argyle	751	20%	13%	8371	35%	23%	15067	Store late water
Park R @ Grafton	2422	47%	31%	40739	35%	20%	26462	Peak flow reduction
Tamarac R ung	1150	24%	13%	11533	13%	12%	7179	Store late water
Drayton ung	1370	8%	10%	22208	8%	10%	22208	Store late water
S Br Two R @ Lake Bronson	503	12%	26%	21735	27%	14%	15208	Store late water
Tongue R @ Akra	50	7%	4%	1580	7%	4%	1580	Store late water
Pembina R @ Neche	1900	13%	9%	51113	13%	9%	51113	Peak flow reduction
Emerson ung	3000	7%	7%	23364	7%	7%	23364	Store late water
Average/Total		17%	13%	817540	22%	13%	885177	
Summary of Mainstem Flow Reductions								
1997 Spring Flood								
	Upstream			Upstream	Upstream	Upstream		
	Contributing???	Peak	Peak	Tributary	Tributary	Tributary		
	Drainage	Flow	Flow	Volume	Volume	Volume		
	Area	Reduction	Reduction		Reduction	Reduction		
Mainstem Locations	sqmi	cfs	%	acft	acft	%		
Wahpeton	4010	2723	21%	801206	106075	13%		
Fargo	6210	5459	19%	1425717	160209	11%		
Halstad	15430	14236	20%	3307686	426566	13%		
Grand Forks	21690	14985	14%	5149686	606198	12%		
Drayton		20679	16%	5912194	719749	12%		
Emerson		25861	20%	6915848	817540	12%		
		Less than allocation or goal						
		Meets allocation or goal						
		Exceeds allocation or goal						
		Hydrologic models not completed						

Table 2.0

GOAL: Maintain, modify, construct, or improve properly functioning watercourses to provide protection to agricultural land for a 10 - year event, while ensuring that there are no resulting downstream adverse impacts. Care must be taken to ensure that there is an adequate downstream outlet to handle this capacity and not create greater hardship to downstream lands.

PRIORITY ISSUE:

Legal (Public) Systems:

- Reduce the number of drainage systems with outlets that are in disrepair.
- Address beaver dams on ditches and natural watercourses.
- Address problem of debris in river channels.
- Address blockages in drainage systems from sediment, vegetation, and other causes.
- Reduce “flashiness” of the hydrograph related to ditches and natural watercourses.
- Reduce damages to legal ditch systems by preventing or correcting slope failures.

Natural Systems:

- Reduce the number of drainage systems with outlets that are in disrepair.
- Address beaver dams on ditches and natural coulees.
- Address problem of debris in river channels.
- Address blockages in drainage systems from sediment, vegetation, and other causes.
- Reduce the “flashiness” of the hydrograph related to ditches and natural watercourses.
- Reduce damages to natural systems by preventing or correcting slope failures.

Private Systems:

- Reduce the number of drainage systems with outlets that are in disrepair.
- Address beaver dams on ditches and natural coulees.
- Address blockages in drainage systems from sediment, vegetation, and other causes.
- Reduce the “flashiness” of the hydrograph related to ditches and natural watercourses.
- Follow all necessary permitting procedures
- Ensure proper construction to prevent erosion problems such as gullies, side slope failures, and washouts.

Road Ditches:

- Reduce the number of drainage systems with outlets that are in disrepair.
- Address beaver dams on ditches and natural coulees.
- Address blockages in drainage systems from sediment, vegetation, and other causes.

- Reduce the “flashiness” of the hydrograph related to ditches and natural watercourses.
- Reduce damages to legal ditch systems by preventing or correcting slope failures.

STRATEGIES:

1) For legal ditch systems, an annual inspection should be done on each system, which identifies the general ditch condition and specific problems, including any restrictions, condition of outlets, bank and bed failures, sedimentation issues, water quality issues, fish & wildlife issues, and any other issues. A ditch operations and maintenance plan should be written for each ditch system and should address annual cattail spraying, beaver dams and maintenance of them, removal of woody vegetation and debris, cover crops on adjacent fields, riparian buffer strips, CRP, wetland restorations, funding needed for maintenance, and other issues deemed appropriate. For systems that have chronic problems, investigate the feasibility of establishing a storm water management unit or water management district and set up of a storm water utility.

A) MN Statute 103D.625 should be utilized to discuss among the various drainage authorities (TRWD, Kittson County, Roseau County, and Joint Drainage Authorities) the potential for turning certain ditches over to the TRWD. This could target systems that have more than one drainage authority or systems that are in more than one county, or systems currently under county jurisdiction but are affected by TRWD impoundments.

B) For all legal systems, an engineering analysis should be conducted to determine what systems currently have design carrying capacities at or above the 10 year runoff event. For those below the 10 year event, consideration should be given and analysis performed to determine the outlet capacity and feasibility of improvement.

C) Many drainage systems are now over 100 years old. The drainage ditch legal files, including but not limited to landowner petitions, engineer reports, viewer reports, public hearing records, construction plans and as-built records, and records of all proceedings should be scanned and converted into modern electronic files in order to preserve the history and make it easier to research the records.

2) For natural systems, an inventory should be completed similar to a ditch inventory & once complete work with DNR to investigate delegating permitting authority. Clean outs of sediment should be done as necessary, and water flow from ditches into natural systems should be controlled by utilizing side pipe inlets or other means. Other maintenance should include brush management, prescribed burning to control vegetation, no farming up to waterway edges, and perpetual easements through programs such as EWP, RIM, & CREP.

A) Work closely with DNR to monitor the current state initiative to update the Protected Waters inventory. This is an opportunity to identify and consider areas discussed above for both flood damage reduction and natural resources enhancement management strategies utilizing the 1998 Red River Basin Mediation Agreement through the Flood Damage Reduction Work Group.

3) For private systems, the *Rules of the Two Rivers Watershed District* should be reviewed and adjusted if necessary. Also, an inventory of sites should be completed and an effort made to identify who is responsible for maintenance, and work with them to do the maintenance. Other strategies include encouraging farmers not to farm to bottoms of ditches and watercourses, cost share on side pipe inlets, riparian buffer strips, sediment traps, fencing to eliminate cattle in ditches, and grassed waterways.

4) For road ditches, the TRWD should work with road authorities (MNDOT, County Highway Dept., & Townships) to identify trouble spots (i.e. where field ditches outlet into road ditches), develop a corrective action plan, and a policy agreement to address capacity of future road construction and maintenance activities. Also, road ditches could be included as a part of (lateral to) legal drainage systems in order to facilitate maintenance. In addition, upstream projects should be incorporated that address timing of flows such as stream restorations and gated storage. Measures should be taken to address sedimentation of ditches due to erosion from adjacent fields resulting from poor tillage practices or lack of cover crop. Maintenance issues include roadside mowing, buffer strips, elimination of the practice of farming ditch bottoms, incorporating wetland projects, and eliminating livestock in ditch systems.

5) For all systems, utilize recent new engineering technology to model all subwatersheds to map out the 10 year floodplain. This should be prioritized and ranking should be done to complete mapping in the areas of most need first. It has been determined and funding approved to map out the SD 91, JD 10, and Unnamed Coulee subwatersheds first.

PREFERRED OUTCOMES: In accordance with the 1998 Mediation Agreement, all ditch systems within the District should be evaluated and considered to eventually have capacity to carry a 10 year frequency storm event (3.5 – 4 inches runoff in 24 hrs). An additional preferred outcome is for reduction of erosion and sedimentation, leading to less complaints, less ditch cleaning, reduction maintenance costs, and improved water quality.

POTENTIAL PARTNERS: Soil & Water Conservation Districts, County Commissioners, County Highway Departments, Townships, DNR, BWSR, FSA, NRCS

GOAL: Reduce the duration, peak, and frequency of overland flooding

PRIORITY ISSUE:

Public Infrastructure:

- Reduce road & culvert damages from flooding.

Agricultural Land:

- Reduce damages to cropland from flooding (delayed planting or destroyed crops).

- Reduce damages to pastures from flooding.

General:

- Address issues associated with crossover flooding from the Roseau River.
- Address beaver dams on ditches and natural watercourses.

STRATEGIES:

1) For Public Infrastructure, expand on the current District culvert sizing policy by implementing a complete culvert sizing project in one or more subwatersheds to effectively size all culverts from upstream to outlet to control the 10 year runoff event. In areas east of U.S. Highway #59, promote land use practices that reduce runoff, promote natural landscape storage activities (wetland & prairie restoration), stream & river rehabilitations to slow down stream flows, incorporation of ag levies where appropriate, install gated storage immediately east of Hwy 59 (in North Branch and Middle Branch subwatersheds) – by doing so in conjunction with other activities the needed acre feet of storage can be reduced. In areas west of U.S. Highway #59, utilize riparian buffers, stream rehabilitation with ag levies, field windbreaks to reduce snow & sediment deposits in drainage systems (will allow ditches to open earlier in spring), immediately west of Hwy 59 utilize off channel gated storage, and emphasize best management practices (conservation tillage & residue management). In areas west of U.S. Hwy 75, investigations regarding the feasibility of improving drainage channels should continue. This type of channel work would be designed to remove local water from the land in advance of the peak of the Red River flooding.

A) The current TRWD culvert inventory, conducted in the late 1990's, is outdated and should be updated, incorporating the latest technology, including Lidar, GIS and survey grade gps. This should be done according to subwatershed boundaries. Because this is a large undertaking the subwatersheds should be prioritized, funding should be sought, and on-the-ground work completed until the entire culvert inventory update is completed.

2) For Agricultural Land, utilize the same strategies as stated in #1 above. This should be done by slowing down water from upstream areas with respect to the 10 year runoff event for ag lands. Pasture management plans should be developed which include tolerant seed mixtures, rotational grazing, and livestock exclusion from streams.

3) For the general category, the same strategies as listed above should be considered. Also, partnerships should be created with the Roseau River WD and Canada to identify issues related to crossover flooding and agree upon possible solutions, including impoundments, diversions, and dike building. A watershed district wide beaver control program should be investigated, with incentives for trappers and payments for beavers in widespread areas, not just on legal drainage systems.

PREFERRED OUTCOMES: Significant reduction in damages to residential, public infrastructure, and private property.

POTENTIAL PARTNERS: SWCD, Townships, Counties, County Highway Dept., NRCS, DNR, BWSR, FSA, USACE, Roseau River Watershed District, International Joint Commission, Red River Basin Commission.

GOAL: Reduce damages to and loss of residential areas from flooding for a 100 year event (minimum)

PRIORITY ISSUE: Reduce damages and losses to urban and rural residents from flooding.

STRATEGIES: Discourage building within the 100 year floodplain and other flood prone areas.

Utilize the farmstead ring dike program and other programs to protect farm residences and out-buildings.

Assess each community's flood protection needs, and implement flood damage reduction projects both upstream from and within municipalities.

PREFERRED OUTCOMES: Protection of rural and urban residential areas from a 100 year frequency flow event. By reducing the damages, a reduction in the cost to repair will occur, resulting in less public and private money needed for disaster assistance.

POTENTIAL PARTNERS: Planning & Zoning, Townships, DNR, RRWMB, FEMA, NRCS, Cities, USACE, Counties, MN Department of Public Safety

GOAL: Minimize effects of drought relative to land use practices

PRIORITY ISSUE:

- Address losses to pasture and cropland associated with drought
- Address issues related to wind erosion

STRATEGIES: Utilize soil moisture and erosion control practices including but not limited to tree plantings (wind breaks), cover crops, buffer strips, policy changes, conservation tillage practices, and wetland restorations. The TRWD will consult the CAC and TAC to target specific key subwatersheds where this should be implemented.

PREFERRED OUTCOMES: Minimize to the extent possible the effects of drought on crop and pasture production and minimize the increased potential of soil erosion due to wind. Ensure that agricultural operations can endure periods of extended drought. Reduce the impacts of sedimentation to watercourses from wind erosion.

POTENTIAL PARTNERS: NRCS, SWCD, DNR, FSA, BWSR, Landowners

GOAL: Enhance and protect ground water supplies.

PRIORITY ISSUE: Maintain an adequate water supply and sustain healthy water quality levels

STRATEGIES:

- Delineate critical recharge areas
- Protect recharge areas using BMP's and land use controls
 - Protect surface waters including wetlands from sedimentation, nutrients, and ag. Chemicals
- Delineate surface and groundwater relationships especially in areas where ground water serves as public water supplies
- Coordinate source water protection and wellhead protection efforts with the Rural Water Systems according to Minnesota Department of Health parameters.
- Regulate water appropriations by Watershed District rule and permit program
- Utilize wetland restorations to filter and protect groundwater systems
- Support well water testing programs

PREFERRED OUTCOMES: Ensure that a viable and permanent source of drinking water for domestic and industrial uses exists within the District.

POTENTIAL PARTNERS: SWCD, NRCS, DNR, North Kittson Rural Water, Kittson Marshall Rural Water, County Water Planners, MDH, MPCA

B. Natural Resources

The following goals, issues, strategies and preferred outcomes have been broken into categories focusing on 1) erosion & sedimentation and 2) restoration/protection strategies & water quality monitoring. Often more monitoring and data is needed to not only to identify the problems and implement solutions, but to also determine if the solutions are effective.

GOAL: Improve and sustain surface water quality

PRIORITY ISSUE: 1) Erosion & Sedimentation

- Reduce erosion & sedimentation to waterways & wetlands
- Restore more natural hydrographs to waters in the watershed – reduce the “flashiness”
- Restore & rehabilitate unstable stream channels in the watershed

2) Watershed Restoration and Protection Strategies (WRAPS) & Water Quality Monitoring

- Continue the TRWD water quality monitoring program on an annual basis at established locations
- Analyze WRAPS and other documents and develop subwatershed plans to protect, enhance and improve stream water quality conditions
- Work to improve water quality and to seek removal of stream reaches from the impaired waters list

STRATEGIES: 1) Erosion & Sedimentation

- Utilize best management practices to install buffer strips along ditch systems adjacent to ag fields
- Identify susceptible areas via monitoring, impaired lists, and Total Maximum Daily Load activities
- Promote grassed waterways where practical and feasible
- Restoration of drained wetlands & creation of new ones
- Reduced field drainage and increase temporary storage in fields designed to hold water for short periods and then release it
- Installation of shelter belts to reduce wind erosion
- Institution of land use controls where necessary & practical
- Stream bank bio-engineering and riparian restoration to create sinuosity, pools, and riffles along watercourses
- Where practical and feasible, promote fencing of cattle and other livestock away from rivers & streams

2) Watershed Restoration and Protection Strategies (WRAPS) & Water Quality Monitoring

- Develop a watershed strategy for water quality improvement
- Coordinate monitoring and preparation of load allocations with local committees, Riverwatch, RRWMB and the MPCA
- Participate with state and local entities in implementing TMDL adopted strategies and load allocation scenarios
- Consider land use control adoption and enforcement where deemed appropriate

PREFERRED OUTCOMES:

1) Erosion & Sedimentation

- Filtration of sediment to reduce sedimentation
- Reduce amount of cattail and other vegetation where sediment normally deposits
- Reduce the need for ditch maintenance
- Promote wildlife travel corridors and migrational habitat
- Achieve compliance for water quality standards on reaches that have been identified as being impaired
- Total Maximum Daily Load allocation plans and strategies for impaired reaches

- Whenever feasible and possible, meet state established water quality standards such as 25 NTU's for Turbidity, 5 mg/l for Dissolved Oxygen, etc.

2) WRAPS & Monitoring

- Same as above for Erosion & Sedimentation
- Reduced load allocation to impaired reaches and improved surface water quality within the watershed and/or target reaches within the watershed

POTENTIAL PARTNERS: SWCD, NRCS, MPCA, DNR, FSA, EPA, BWSR, MN Dept. of Ag, USFWS, USGS, County Water Planners, Others

GOAL: Reduce erosion & sedimentation

PRIORITY ISSUE:

- Restore more natural hydrographs to waters in the watershed – reduce the “flashiness”
- Restore & rehabilitate unstable stream channels in the watershed
- Establish and maintain functional buffers along ditches. This should include the use of side inlets to minimize erosion from fields
- Land use practices (i.e. tillage)

STRATEGIES:

- Same strategies as listed for surface water quality
- Riparian buffers, best management practices for tillage, and grassed waterways for problem areas as identified in the MCEA report and by SWCD's
- Coordinate the establishment of a watershed wide surface water quality monitoring network with MPCA, River Watch, RR Basin Institute, RR Basin Commission, & SWCD (this would include TMDL activities on a temporary basis)
- Regulate and enforce setbacks, buffers and investigate the need for a soils loss limit ordinance
- Protect areas and / or tracts of land that currently function as buffers or filters.

PREFERRED OUTCOMES:

- Approach acceptable levels of soil loss as indicated through NRCS
- Convert “T” to reductions in pounds per acre for total suspended solids, phosphorous, and reduction in concentrations for surface waters
- Include in TMDL load allocation scenarios where appropriate for measurable goals and results
- Soil loss reductions in pounds per acre

POTENTIAL PARTNERS: SWCD, Counties, MPCA, DNR, BWSR, MN Dept. of Ag, RRBI, RRBC, RRWMB, NRCS, FSA, EPA, USFWS, others

GOAL: Participate in efforts to enhance, establish, and protect stream corridors and riparian areas

PRIORITY ISSUE:

- Restore & rehabilitate unstable stream channels in the watershed
- Identify and protect existing riparian corridors / areas
- Enhance / widen / improve degraded riparian corridors / areas
- Establish functioning riparian areas along all waterways in the watershed
 - Establish and maintain functional buffers along ditches. This should include the use of side inlets to minimize erosion from fields.

STRATEGIES:

- Continue to enforce the MN Buffer Law
- SEE STRATEGIES UNDER IMPROVE/SUSTAIN SURFACE WATER QUALITY
- Reduce high water velocities & thereby reduce siltation and flashiness of hydrograph
- Incentive programs to establish buffers, storm water detention
- Inventory & identify priority areas
- Connect riparian areas & establish corridors while addressing erosion & sedimentation, plus surface water issues

PREFERRED OUTCOMES: Identify how many miles or how many acres established or restored. Establishment of wildlife habitat in western end of the watershed. Improved wildlife use (i.e. gray partridge). Improved sustainability of natural waterways.

POTENTIAL PARTNERS: SWCD, Counties, MPCA, BWSR, DNR, MN Dept. of Ag, NRCS, FSA, USFWS, EPA, USACE

GOAL: Participate in efforts to enhance, provide, & protect habitats

PRIORITY ISSUE:

1) Aquatic

- Restore more natural hydrographs to waters in the watershed. Reduce the flashiness of the hydrograph.
- Restore and rehabilitate unstable stream channels in the watershed
- Maintain and restore fish passage in streams throughout the watershed
- Identify and protect existing wetland habitats
- Enhance degraded wetland habitats (identify them first)
- Establish new wetlands (identify where & for what purpose)

2) Terrestrial

- Establish and maintain functional buffers along ditches. This should include the use of side inlets to minimize erosion from fields
- Establish large habitat blocks of grassland, wetland, and forest
- Identify and protect existing upland habitats

STRATEGIES:

1) Aquatic

- Connect fish habitats & encourage habitat diversity
- Denote priority areas of concern or areas of greatest opportunity in conjunction with other natural resource enhancement issues
- Further investigate index of biotic integrity surveys for priority areas
- Utilize programs like continuous CRP, WRP, and others
- Use existing programs to achieve habitat goals
- Provide technical assistance to agencies and property owners

2) Terrestrial

- Connect upland habitats, provide habitat blocks, and encourage habitat diversity
- Utilize CRP, WRP, grassed waterways, wetland restorations, and other programs
- Same criteria as used for aquatic habitats

PREFERRED OUTCOMES:

1) Aquatic

- Monitor aquatic life in waterways
- Monitor the habitat for changes resulting from proposed actions
- Achieve more consistent waterfowl and wetland wildlife use
- Reference stream standards for Index of Biotic Integrity's
- Create healthier and more diverse fish populations throughout the TRWD

2) Terrestrial

- Observe growth of wildlife populations or use in current non-use areas
- More hunting or other outdoor recreational activities observed
- See expansion of sharp tailed grouse to west (i.e. use buffer areas or habitat blocks where there currently are none)

POTENTIAL PARTNERS: SWCD, DNR, MPCA, BWSR, NRCS, FSA, EPA, USFWS, Private Groups (DU, Audubon, TNC, etc.)

GOAL: Support the expansion of water based recreation

PRIORITY ISSUE: Public access for boats, canoes, hunting, recreational vehicles, etc.

STRATEGIES: Increase public awareness of issues and opportunities

PREFERRED OUTCOMES: Increase the accessibility of recreational areas to the public; balance conflicting uses by providing equal opportunity for each kind of activity.

POTENTIAL PARTNERS: DNR, Counties, private organizations (DU, Ruffed Grouse Society, birding groups, MN Deer Hunters, ATV & Snowmobile clubs, etc.), other agencies

GOAL: Provide educational and outreach opportunities

PRIORITY ISSUE: Increase public knowledge and understanding of watershed district activities and programs

STRATEGIES:

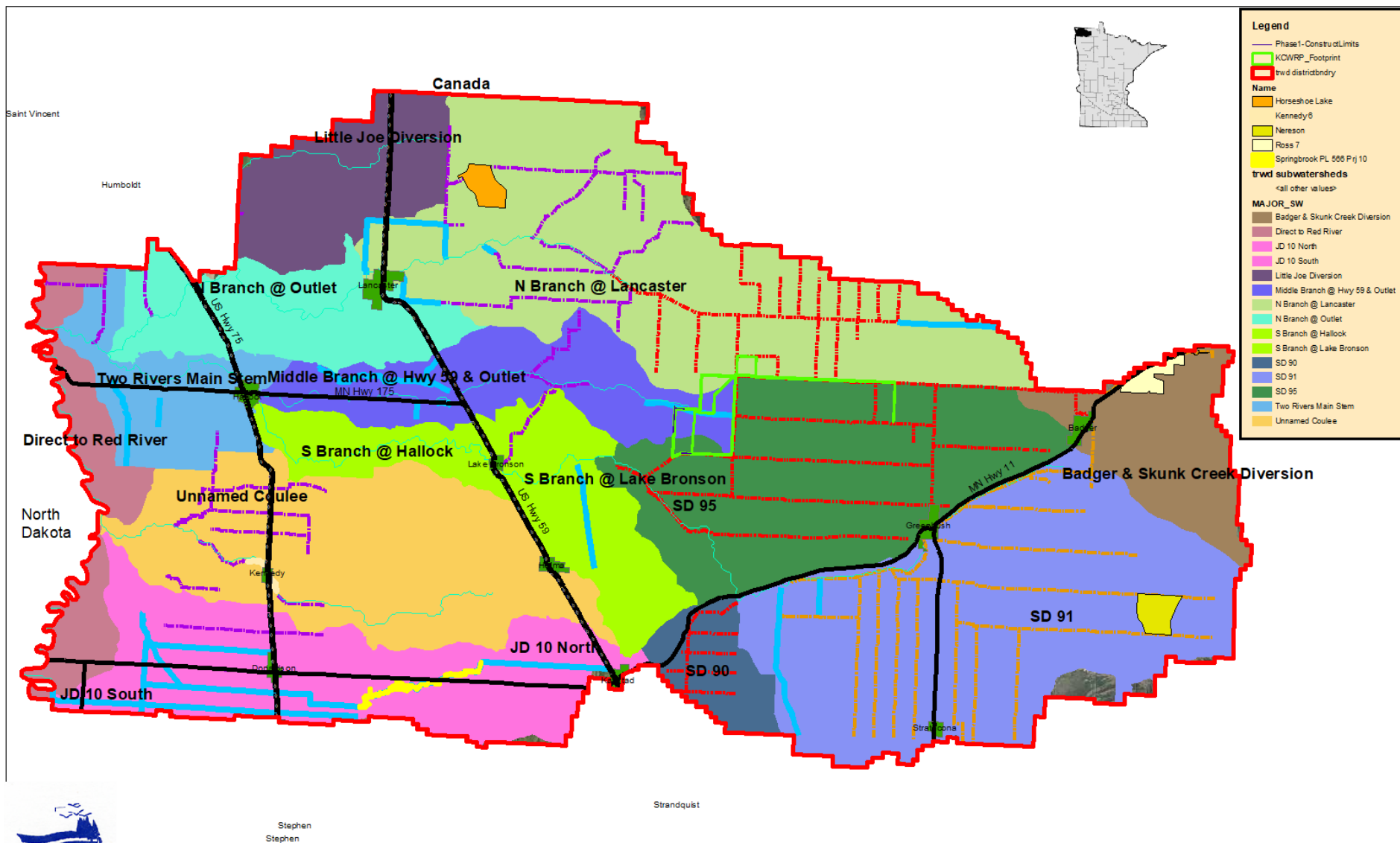
- Develop a demonstration site to be used for future promotion of conservation and flood issues
- Participate in the *Envirothon*, *Riverwatch*, and other educational activities
- Provide periodic news releases to area media as needed and disseminate information through printed media, email and mailings, and radio

PREFERRED OUTCOMES: Educate the public in order to facilitate a better understanding of the scientific and natural processes that affect water management and the environment

POTENTIAL PARTNERS: SWCD, RRWMB

Major Sub-watersheds of the TRWD

The area of the TRWD was divided into thirteen sub-watersheds. These major sub-watersheds were analyzed and issues and goals were listed for each. The following section discusses these areas, summarizes the ongoing issues in each, lists projects and activities that have been constructed or implemented, and provides a status report for conditions within the sub-watershed.



Two Rivers Watershed District Subwatersheds

0 5 10 20 Miles

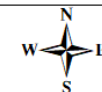
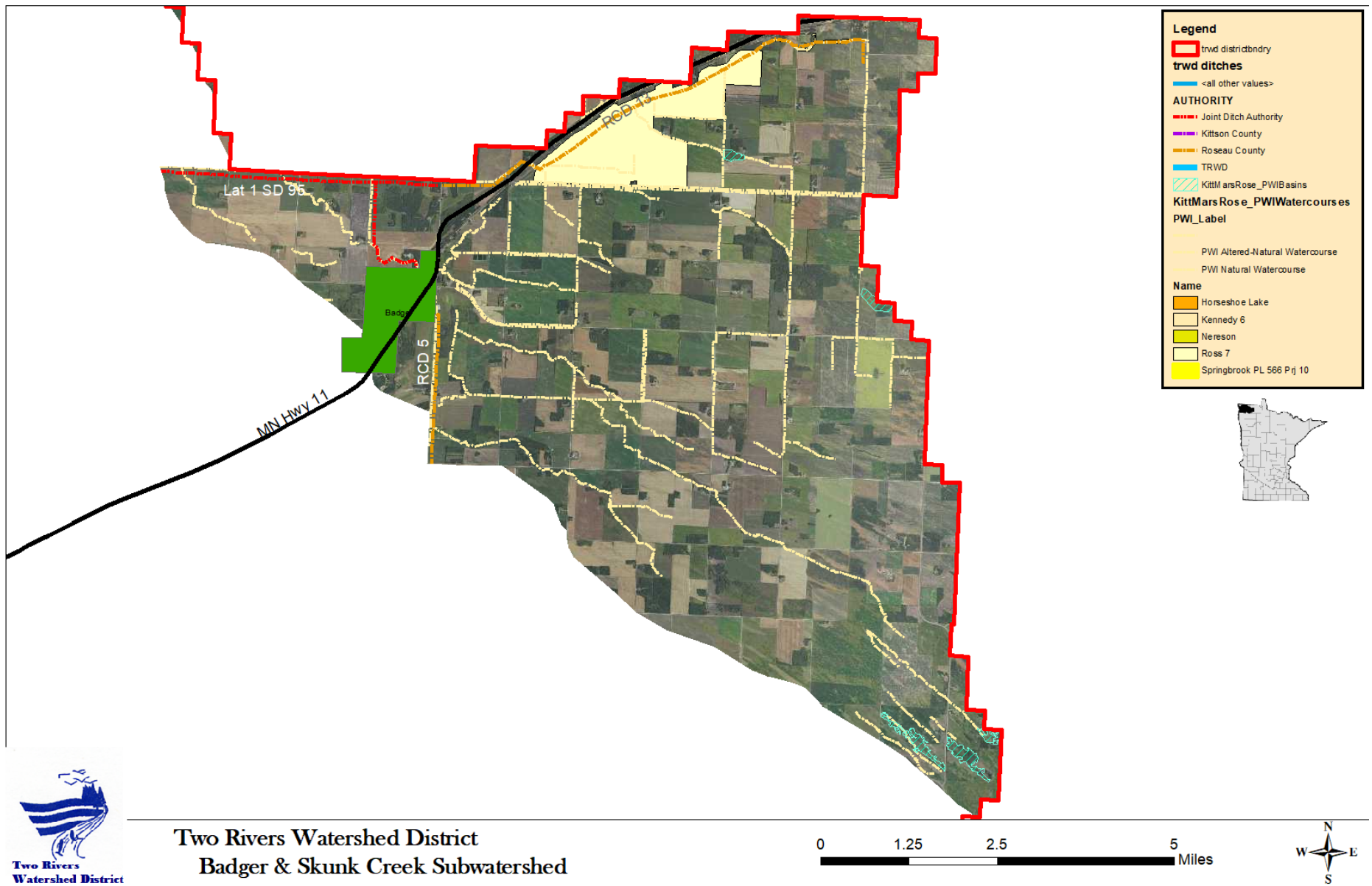


Figure 11.0

State Ditch 95 & Badger/Skunk Creek Planning Zones

- ❖ **Description:** This area is approximately 160 square miles in size and comprises the drainage area of State Ditch #95. The landscape is characterized by cultivated land/pasture/ interspersed with wetlands/grassland. Topography is steep in the east and relatively flat in the west end of the watershed.
 - **Cities:** Badger, Greenbush
 - **Runoff Timing Zone:** Middle & Late
- ❖ **Legal Drainage Ditches:** *Roseau County:* RCD 5, RCD 13, *Joint Ditch Authority:* SD 95
- ❖ **Other Watercourses** include Badger Creek, Skunk Creek and a portion of the South Branch Two Rivers between Pelan and Lake Bronson. Also several unnamed coulees connect to the legal drainage ditches and the South Branch.
- ❖ **TRWD Projects:** Ross #7 Impoundment; Klondike Clean Water Retention Project
- ❖ **Other Structures:** None.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding (including along SD 95 and also upstream of and in Badger), overflows from Roseau River, maintenance of drainage ditches, inadequate channel capacities / drainage issues; steep fall from east to west, wind & water erosion, buffers.
 - **Natural Resource Enhancements:** water quality impairments, ditch and stream bank erosion, fish passage, and unstable stream flows.
 - **Other:** Groundwater and wellhead protection; drought;
 -
- ❖ **Solution Alternatives:**
 - Impoundments, culvert sizing, diking / flood proofing, construct/improve/maintain systems to 10 year runoff designs in accordance with FDRWG Mediation Agreement, BMP's like side water inlets, buffers and grade control, implement Beaches Area Fen Management Plan.
 -
- ❖ **Goals/Objectives/Action Items:**
 - The Klondike Clean Water Retention Project has been planned, designed, permitted, partially funded and all right of way has been obtained. The next stages are to seek further funding and continue with construction.
 - Address water quality impairments on Lateral 1 SD 95, South Branch Two Rivers, and Skunk Creek; ID erosion sources and target for cost share; promote and maintain buffers – enforce buffer law where applicable.
 - Implement and promote ditch inspection and maintenance schedules under drainage law to ensure ditch systems are functioning to their full design capacities.
 - Best Management Practices: utilize storage project, wetland restorations, culvert sizing and other practices to improve stream flows to a more natural hydrograph, which will reduce erosion, provide aquatic habitat, and potentially reduce flooding.
 - Monitoring; continue to monitor water quality, streamflow and other factors.



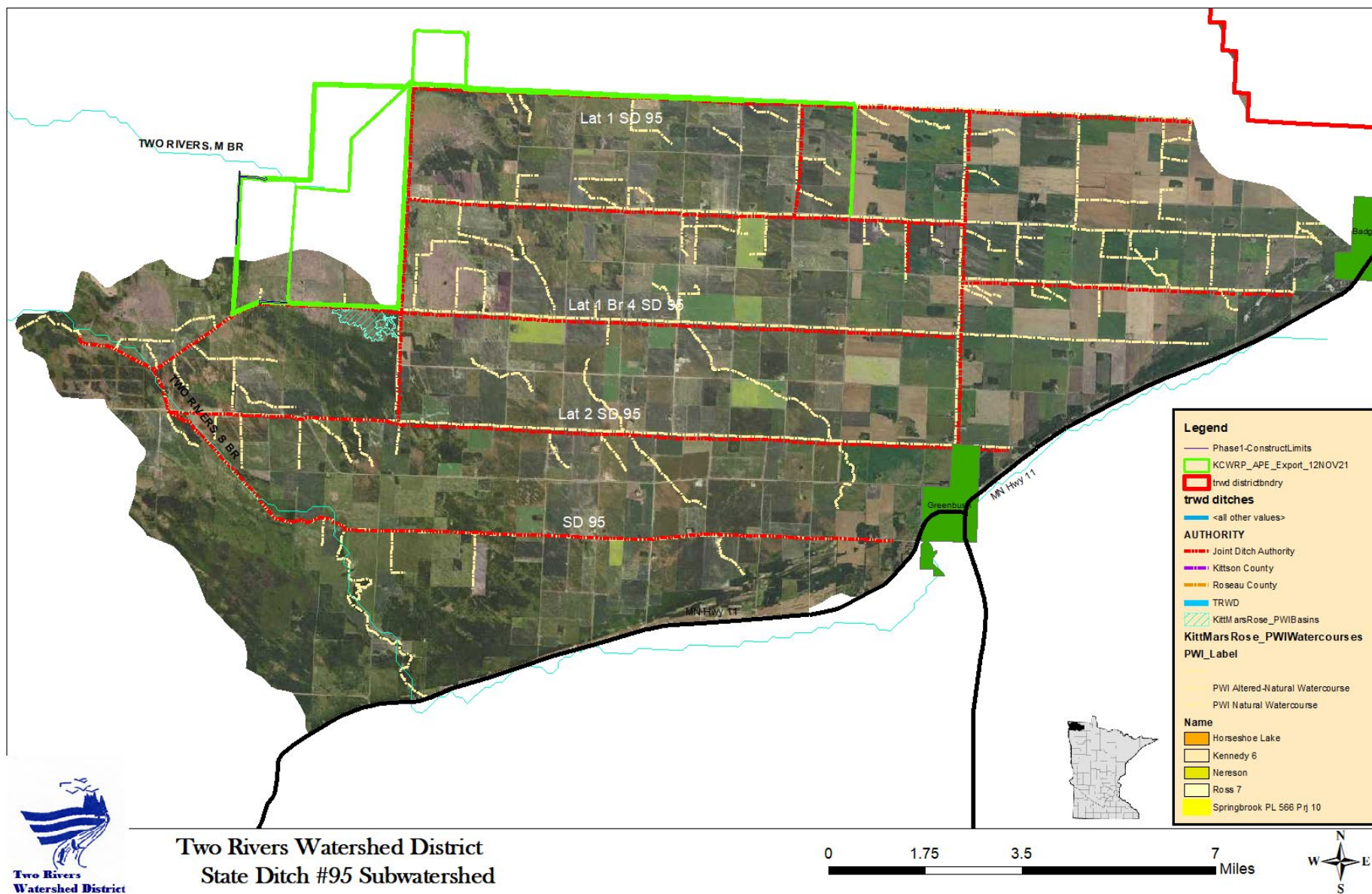


Figure 13.0

State Ditch 90 & State Ditch 91

Planning Zones

- ❖ **Description:** This area is approximately 232 square miles in size and comprises the drainage area of State Ditches #90 & #91. The landscape is characterized by mostly cultivated and pasture land, although the southeastern portion harbors extensive wetland. The South Branch Two Rivers was straightened by the construction of SD 91 in the early 1900's. The 'Twin Lakes', Twistal Swamp' and 'Nereson WMA' are major landscape features located in this planning zone. Topography is steep from south to north and relatively gradual from east to west. A glacial beach ridge known as the 'Campbell Beach' runs along the north edge of these zones.
 - **Cities:** Greenbush, Strathcona
 - **Runoff Timing Zones:** Middle & Late
- ❖ **Legal Drainage Ditches:** *Roseau County:* SD 91 and 12 separate laterals to SD 91
TRWD: RCD 4 *Joint Ditch Authority:* SD 90 and laterals
- ❖ **Other Watercourses** South Branch Two Rivers serves as outlet for SD 90 & 91 and other ditches. A few unnamed coulees connect to the legal drainage ditches.
- ❖ **TRWD Projects:** Dewey 5, Nereson Impoundment
- ❖ **Other Structures:** A control structure on SD 90 to control the outlet of Twin Lakes is operated by MN DNR.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding along SD 91/S. Br. Two Rivers from the Greenbush area west to RCD 4, inundating public roads and ag land. Issues of note include road washouts, crop and hay land flooding, maintenance of drainage ditches, channel capacities / drainage issues, and inadequate outlet.
 - **Natural Resource Enhancements:** habitat, water quality impairments on SD 91 and RCD 4, fish passage, wind/water erosion, buffers and unstable stream flows.
 - **Other:** Groundwater & wellhead protection; drought
- ❖ **Solution Alternatives:**
 - Impoundments, culvert sizing, diking / flood proofing, construct/improve/maintain systems to 10 year runoff designs in accordance with FDRWG Mediation Agreement, BMP's like side water inlets, buffers and grade control,
- ❖ **Goals/Objectives/Action Items:**
 - Address water quality impairments on SD 91, South Branch Two Rivers, and RCD 4; ID erosion sources and target for cost share; promote and maintain buffers – enforce buffer law where applicable.
 - Implement and promote ditch inspection and maintenance schedules under drainage law and utilize FDRWG mediation agreement to ensure ditch systems are functioning to their full design capacities.
 - OTHER: utilize storage projects, wetland restorations, culvert sizing and other practices to improve stream flows to a more natural hydrograph, which will reduce erosion, provide aquatic habitat, and potentially reduce flooding.

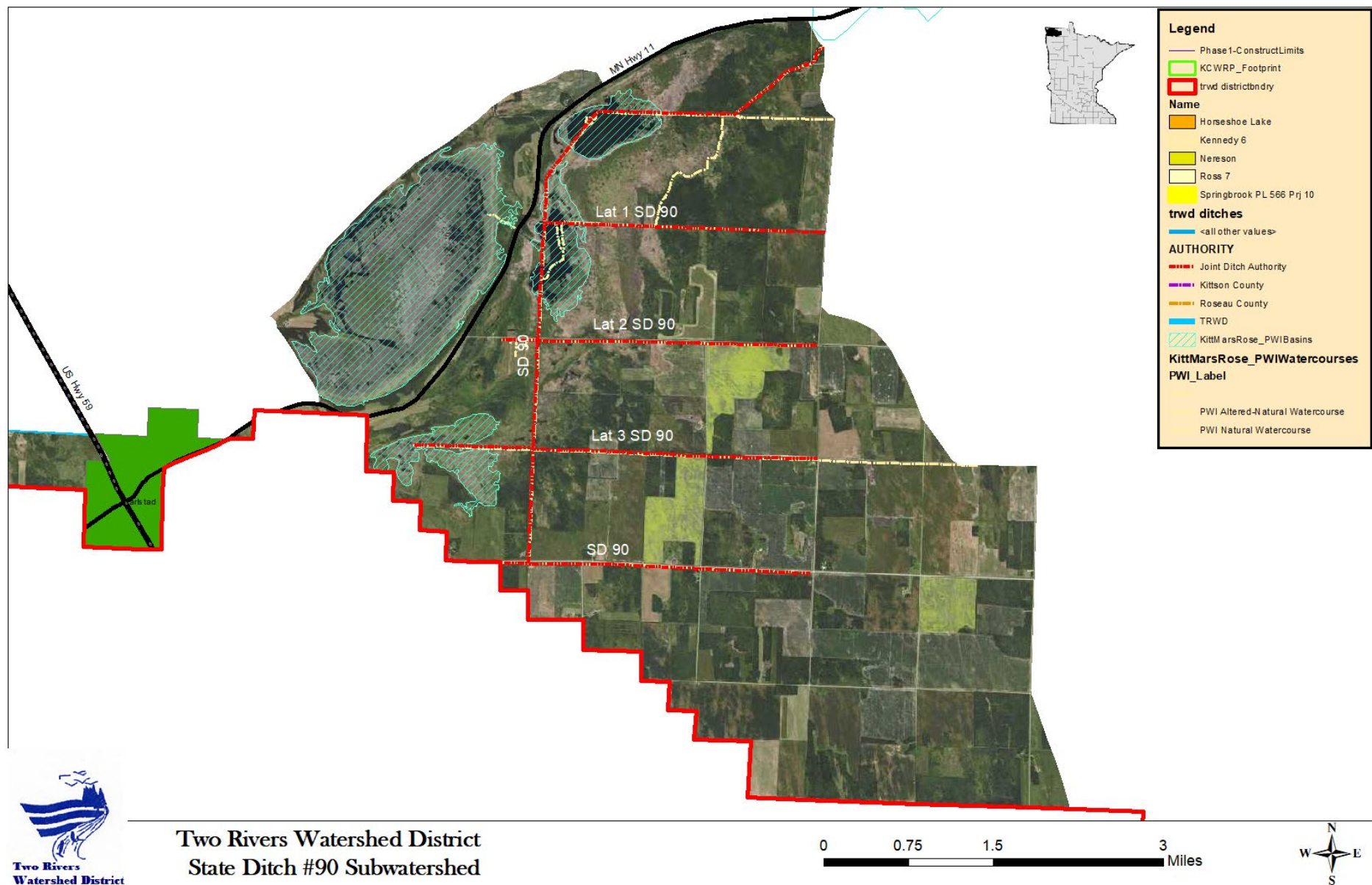


Figure 14.0

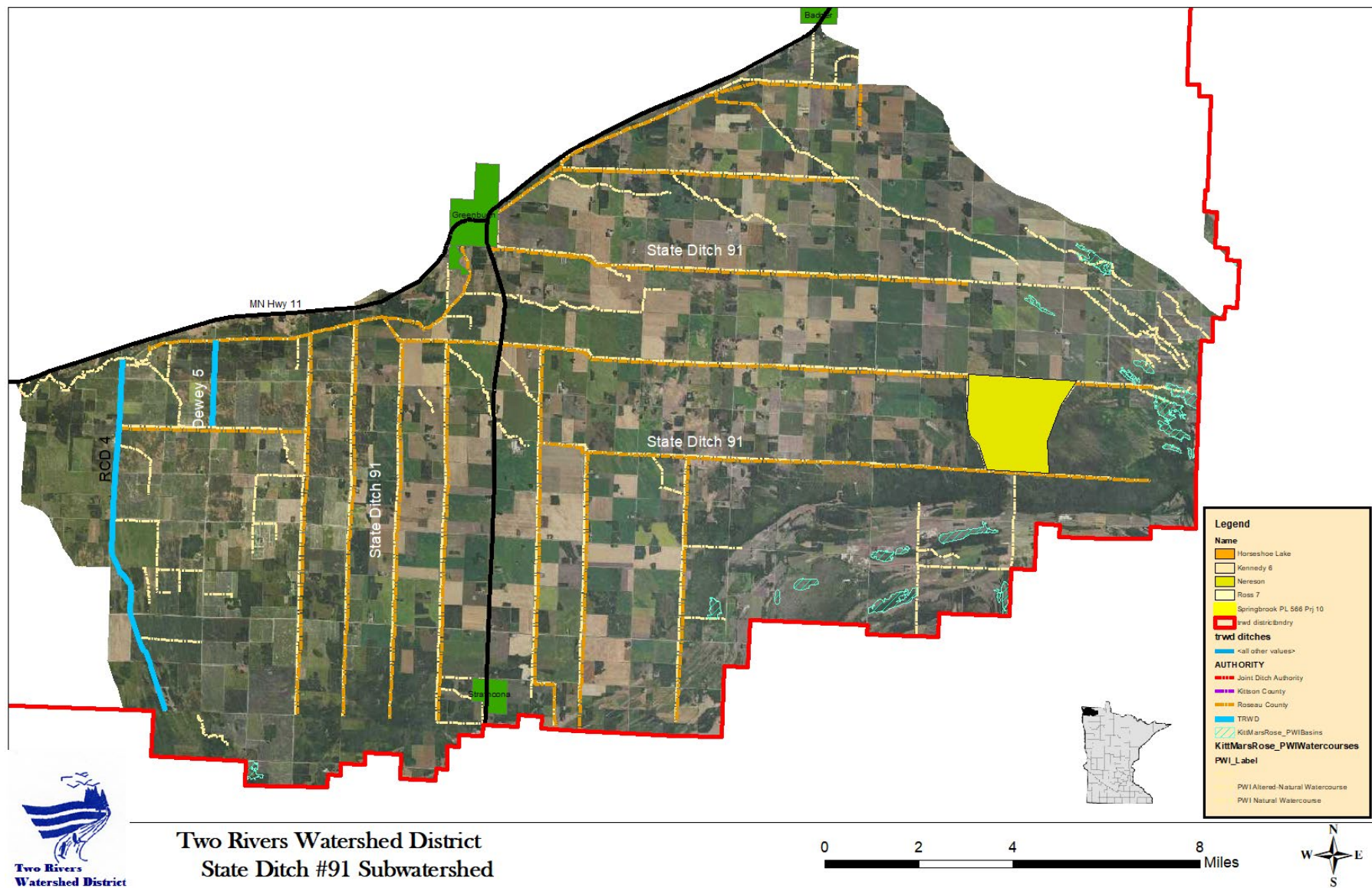


Figure 15.0

North Branch Two Rivers Planning Zones

@ Lancaster and @ Outlet

- ❖ **Description:** This planning zone is approximately 219 square miles in size. Consists of several wildlife management areas in the upstream, northeasterly areas interspersed with pasture, hay land, and ag. Cultivated land is dominant in the middle and westerly areas of the zone, except that the corridor along the North Branch Two Rivers is wooded. Notable landscape features include Skull Lake. Topography is steep in upper reaches of the planning zone, and relatively flat in the downstream reaches.
 - **Cities:** Lancaster
 - **Runoff Timing Zones:** Early & Middle
- ❖ **Legal Drainage Ditches:**
 - *Kittson County:* KCD 11, KCD 13, KCD 14, KCD 18, JD 31, JD 32, SD 84
 - *Joint Ditch Authority:* SD 72
 - *TRWD:* SD 85 Improvement
- ❖ **Other Watercourses:** Several unnamed coulees connect legal ditches and the North Branch Two Rivers.
- ❖ **TRWD Projects:** North Branch Project #2 PL 566 (JD 31, SD 84, Skull Lake Dam), Soler Project #4, KCD 13 Improvement
- ❖ **Other Structures:** James J. Hill dam at Northcote (privately owned).
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding, overflow flooding from Roseau River, Red River flooding, road washouts, crop and hay land flooding, maintenance of drainage ditches, insufficient channel capacities / drainage issues,
 - **Natural Resources Enhancements:** Natural resource issues include habitat, fish passage, wind erosion, buffers and unstable stream flows.
 - **Other:**
- ❖ **Solution Alternatives**
 - Impoundments, culvert sizing, construct/improve/maintain systems to 10 year runoff designs in accordance with FDRWG Mediation Agreement, BMP's like side water inlets, buffers and grade control,
- ❖ **Goals/Objectives/Action Items:**
 - The Klondike Clean Water Retention Project has been planned, designed, permitted, partially funded and all right of way has been obtained. The next stages are to seek further funding and continue with construction.
 - Address water quality impairments on SD 84, SD 85 improvement, JD 31 and North Branch Two Rivers; ID erosion sources and target for cost share; promote and maintain buffers – enforce buffer law where applicable; utilize Beaches Area Fen Management Plan.
 - Implement and promote ditch inspection and maintenance schedules under drainage law to ensure ditch systems are functioning to their full design capacities.

OTHER: utilize storage project, wetland restorations, and other practices to improve stream flows to a more natural hydrograph, which will reduce erosion, provide aquatic habitat, and potentially reduce flooding.

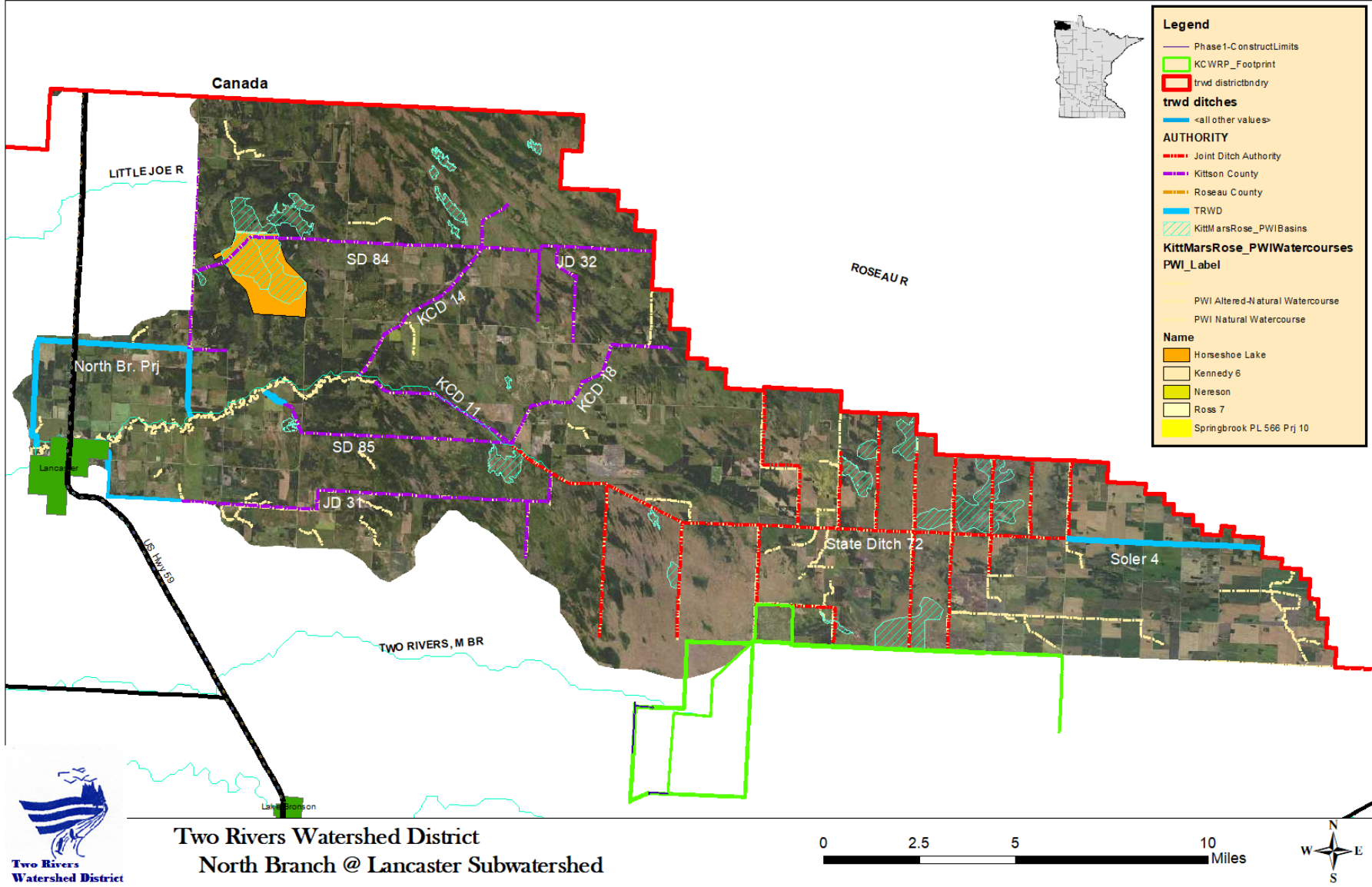


Figure 16.0

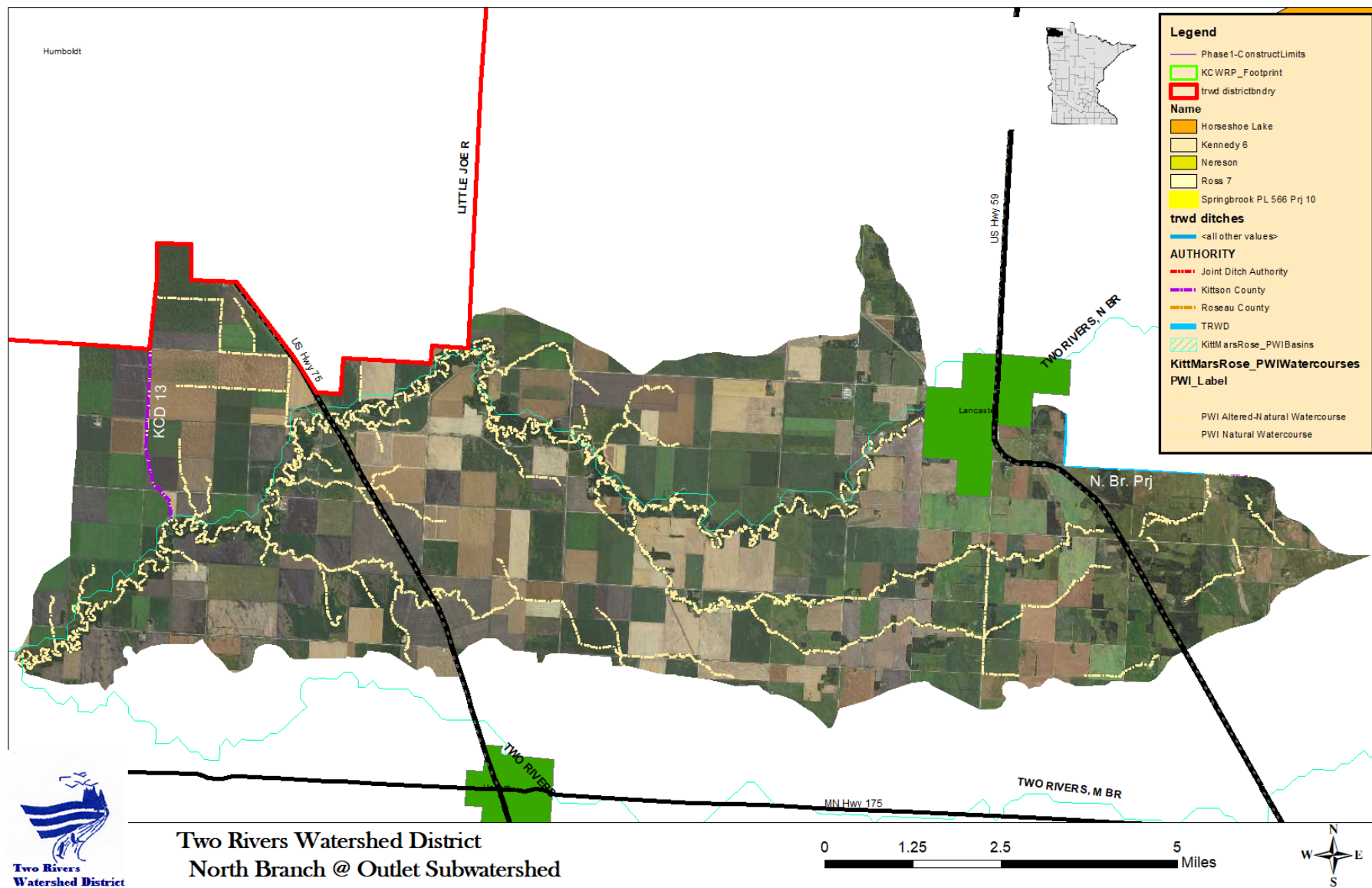


Figure 17.0

Middle Branch Two Rivers Planning Zone

- ❖ **Description:** Area extends from the Roseau / Kittson County line, passes north of the City of Lake Bronson, and ends where the Middle Branch joins the South Branch Two Rivers at the City of Hallock. The landscape is characterized by pasture/grass/wetlands/crp/forest in the east transitioning to cultivated land in the west. Topography is steep in the east and flat in the west.
 - **Cities:** Hallock
 - **Runoff Timing Zone:** Early & Middle
- ❖ **Legal Drainage Ditches:** *Kittson County:* KCD 15, KCD 23 *TRWD:* SD 50
- ❖ **Other Watercourses** include the Middle Branch of the Two Rivers. Also, several coulees connect to the legal drainage ditches and the Middle Branch.
- ❖ **TRWD Projects:** Middle Branch PL566 Project constructed in the 1960's; The TRWD is currently working to construct the Klondike Clean Water Retention Project, a multipurpose impoundment to store up to 35,000 acre feet of floodwater, provide habitat for flora and fauna, and improve water quality.
- ❖ **Other Structures:** A small dam was constructed by the DNR on State Ditch #50 in the 1960's which created Beaches Lake, within the Beaches Lake Wildlife Management Area.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding, water breaks out of Middle Branch impacting farmland, maintenance of drainage ditches, channel capacities / drainage issues; beavers and beaver dams
 - **Natural Resources Enhancements:** habitat, steep fall from east to west, wind erosion, buffers. Ecologically, a prairie rich fen exists in the upstream end of the watershed (refer to Beaches Area Fen Management Plan).
 - **Other:**
- ❖ **Solution Alternatives:**
 - Tech Paper 11 objectives within runoff timing zones
 - Maintain 10 year capacity for drainage ditches
 - BMP's
- ❖ **Goals/Objectives/Action Items:**
 - Construction of KCWRP impoundment
 - Inspect and maintain systems
 - Address water quality impairments
 - Inventory erosion

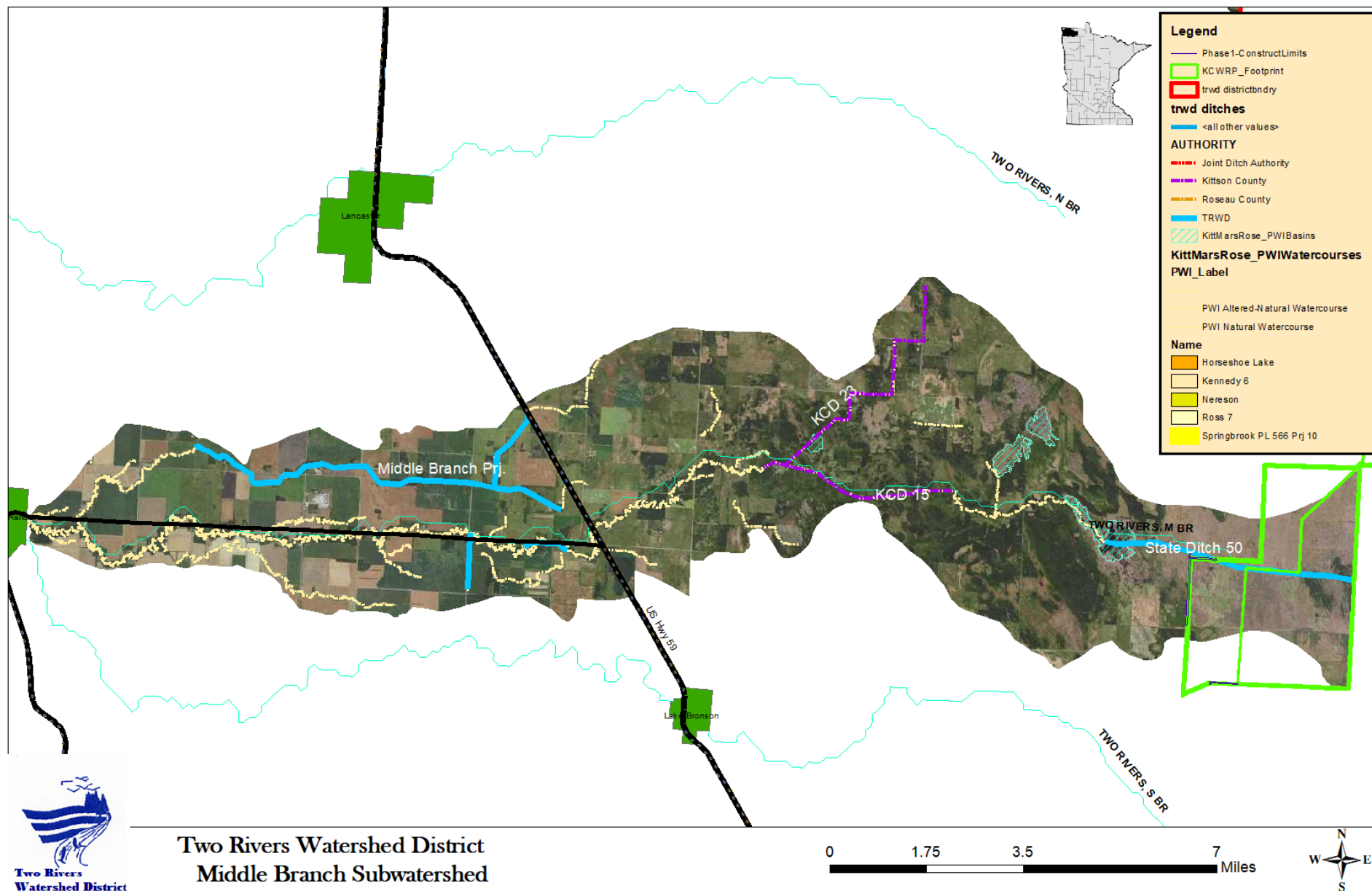


Figure 18.0

South Branch Two Rivers Planning Zone

- ❖ **Description:** This area is approximately 135 square miles in size and comprises the drainage area of State Ditch 49, the South Branch Two Rivers from Lake Bronson to Hallock, and the South Branch Two Rivers from Hallock to the Red River. The landscape is characterized by pasture, hay, grassland-wetland east of US Hwy 59 and intensive cropland west of US Hwy 59. Major landscape features include Lake Bronson State Park. Topography is steep in upper reaches of the planning zone, and relatively flat in the downstream reaches.
 - **Cities:** Hallock, Lake Bronson, Halma
 - **Runoff Timing Zone:** Early
- ❖ **Legal Drainage Ditches:** *Kittson County:* SD 48 *TRWD:* SD 49
- ❖ **Other Watercourses:** A few unnamed coulees connect to the South Branch Two Rivers.
- ❖ **TRWD Projects:** None
- ❖ **Other Structures:** Lake Bronson Dam, Hallock Dam Conversion.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding along SD 49, road washouts, crop and hay land flooding, maintenance of drainage ditches, insufficient channel capacities / drainage issues, wind erosion, buffers.
 - **Natural Resource Enhancements:** habitat, algae blooms & sedimentation on Lake Bronson, water quality impairments on SD 49 and S. Br. Two Rivers, fish passage, and unstable stream flows.
 - **Other:**
- ❖ **Solution Alternatives:**
 - Maintain 10 year capacity
 - BMP's
 - TP 11 for early timing zone
- ❖ **Goals/Objectives/Action Items:** inventory erosion; address water quality impairments; address LB sedimentation & nutrient loading; ID storage areas utilize permit conditions to regulate flows and water quality in downstream areas; other...

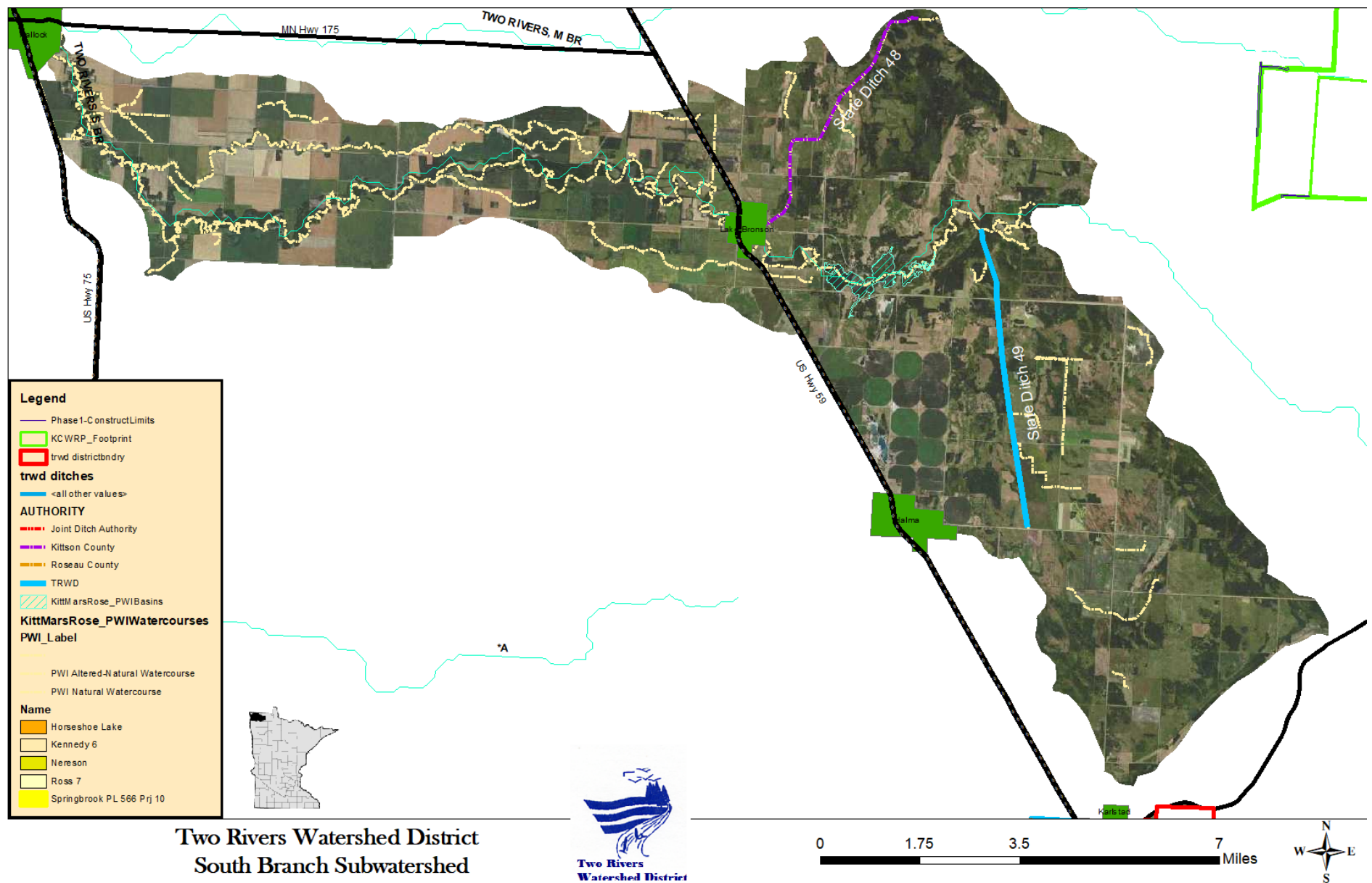
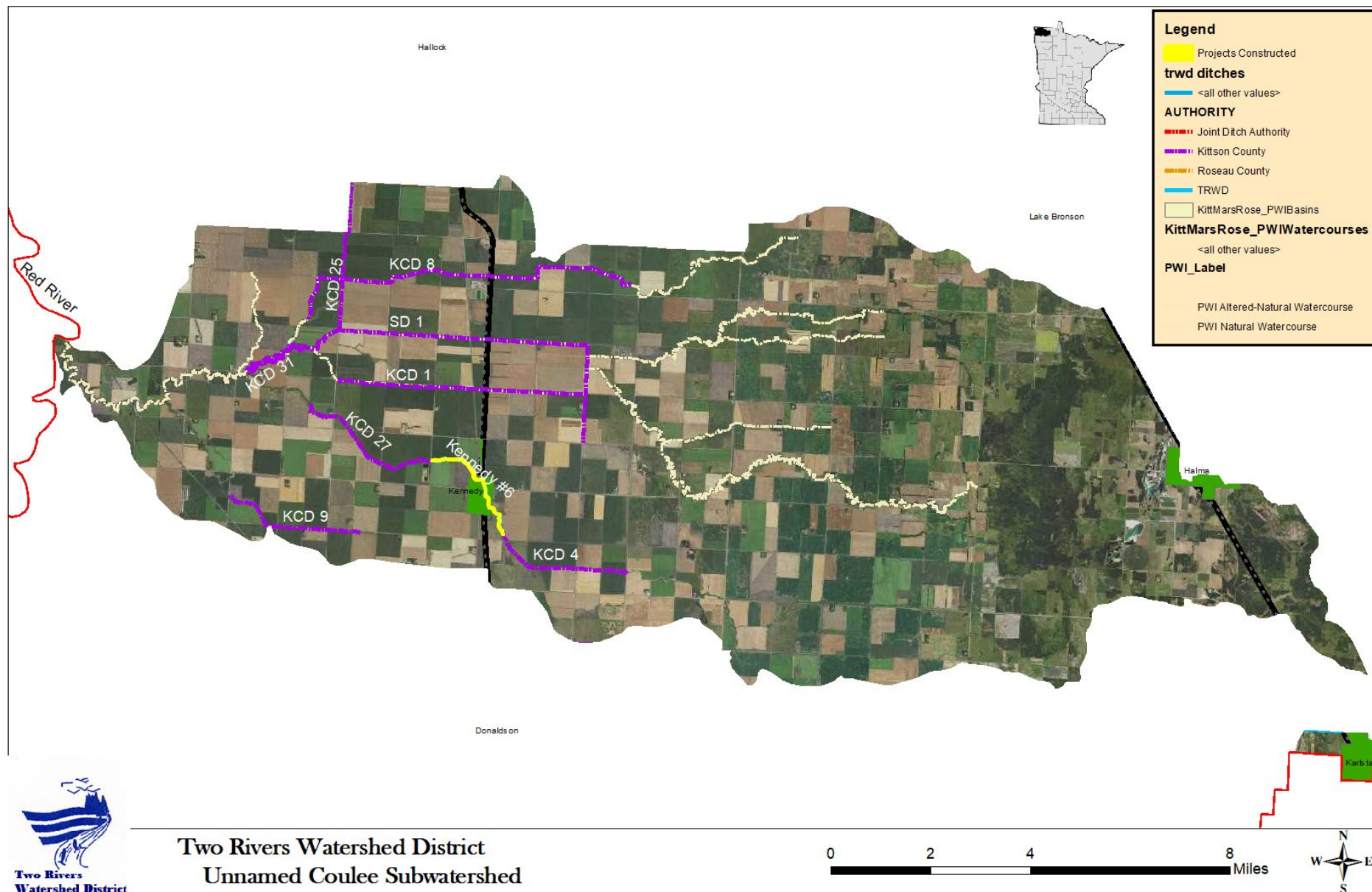


Figure 19.0

Unnamed Coulee Planning Zone

- ❖ **Description:** Area is approximately 170 square miles in size and is characterized by pasture/grass/crp/forest in the east transitioning to cultivated land in the west. Numerous gravel pits have been excavated in this zone. Major landscape features include a series of gravel pits, and the Halma Swamp, located west of the City of Halma. Topography is steep in the east and flat in the west.
 - **Cities:** Halma, Kennedy
 - **Runoff Timing Zone:** Early
- ❖ **Legal Drainage Ditches:** KCD 1, KCD 4, KCD 8, KCD 9, KCD 25, KCD 27, KCD 31, SD 1
- ❖ **Other Watercourses** include a network of coulees connected to the legal drainage ditches. There are no rivers in this zone.
- ❖ **TRWD Projects:** Kennedy #6, Springbrook CR #61
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding, Red River flooding, maintenance of drainage ditches, channel capacities / drainage issues; steep fall from east to west, wind erosion, buffers, stabilize erosive channels
 - **Natural Resources Enhancement:**
 - **Other:**
- ❖ **Solution Alternatives:**
 - Construct/Improve/Maintain ditch systems to 10 year runoff designs in accordance with RRFDRWG Mediation Agreement and MN Ditch Law.
 - Incorporate BMP's such as buffer strips, side water inlets, and grade stabilization structures on ditch systems to control erosion and improve water quality.
 - Utilize set back levees, impoundments, culvert sizing, permit conditions, conveyance methods, wetland restorations, flood proofing and ring dikes where appropriate to prevent flood damages and stabilize flows.
 -
- ❖ **Goals/Objectives/Action Items:**

Identify eroded watercourses and target for BMP cost share; Promote & maintain buffers and enforce riparian buffer law where applicable; Identify at risk farmsteads and target for ring dikes; identify vulnerable infrastructure to target for flood proofing or protection; Inspect ditches and watercourses to identify any maintenance needs; work with NWS, USGS, DNR and others to maintain flood watches and warnings;



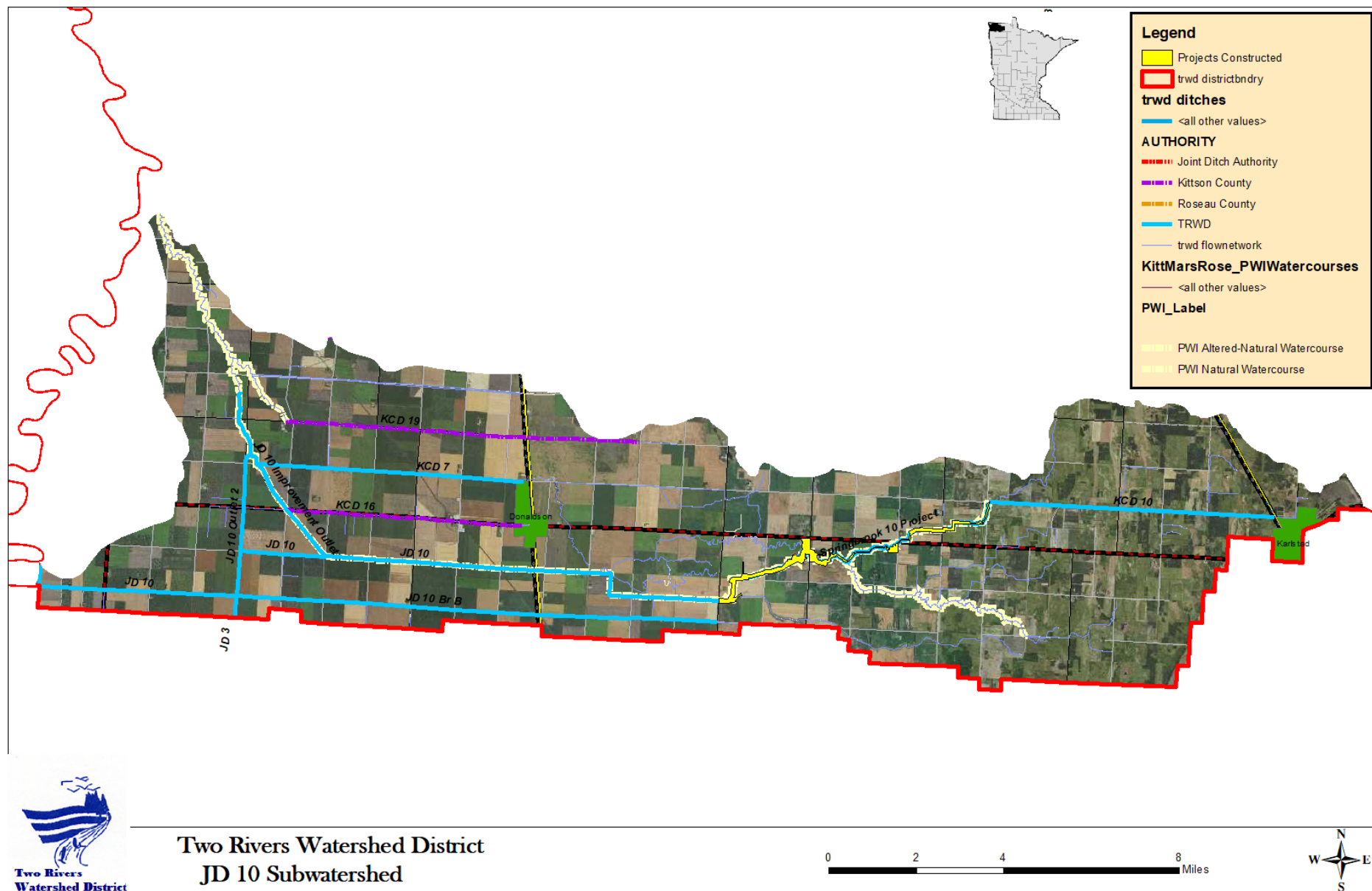
Two Rivers Watershed District
Unnamed Coulee Subwatershed

Figure 20.0

Judicial Ditch #10 Sub-Watershed

- ❖ Description: Area is approximately 130 square miles in size and is characterized by pasture/grass/crp/forest in the east transitioning to cultivated land in the west. Topography is steep in the east and flat in the west.
 - Cities: Karlstad, Donaldson
- ❖ Legal Drainage Ditches:
 - TRWD - KCD 7, KCD 10, JD 3, JD 10, JD 10 Branch B;
 - Kittson County - KCD 16, KCD 19
- ❖ Other Watercourses include a network of intermittent coulees connected to the legal drainage ditches. The Red River of the North impacts the western edge of this subwatershed.
- ❖ TRWD Projects: Springbrook 10 (2013); KCD 10 grade stabilization (1996); JD 10 erosion control (2008); JD 3 side water inlets (2022); KCD 7 Grade Stabilization (2017)
- ❖ Common Issues:
 - *Flood Damage Reduction*: Overland flooding; Red River flooding; maintenance of drainage ditches; steep fall from east to west; drainage ditches located west of Hwy 75 are impacted by large drainage areas upstream to the east; overflows from Twistal Swamp.
 - *Natural Resources Enhancements*: wind erosion, buffers, stabilize erosive channels, stable flows, habitat
 - *Other*: JD 10 classified as impaired water – seek to reclassify use designation
- ❖ Solution Alternatives:
 - Construct/Improve/Maintain ditch systems to 10 year runoff designs in accordance with RRFDRWG Mediation Agreement and MN Ditch Law.
 - Incorporate BMP's such as buffer strips, side water inlets, and grade stabilization structures on ditch systems to control erosion and improve water quality.
 - Utilize set back levees, impoundments, culvert sizing, permit conditions, conveyance methods, wetland restorations, flood proofing and ring dikes where appropriate to prevent flood damages and stabilize flows.

Goals/Objectives/Action Items: a) *Use permit conditions to regulate flows in upstream areas (east of Hwy 75) that have steep gradients (tile check valves, culvert sizing, etc.);* b)



Two Rivers Watershed District JD 10 Subwatershed

Figure 21.0

Little Joe River Sub-Watershed

- ❖ **Description:** This planning zone is approximately 64 square miles in size and comprises the area drained by the Little Joe River and 3 other unnamed coulees. The zone consists of predominantly agricultural land with pasture-hay-grassland in the upper 1/3, and cultivated land in the remaining 2/3 of the area. Topography is relatively steep across most of the planning zone.
 - **Cities:** None
 - **Runoff Timing Zone:** Early
- ❖ **Legal Drainage Ditches:** *Kittson County:* KCD 22
- ❖ **Other Watercourses** include three major unnamed coulees and the Little Joe River all are tributary to KCD 22.
- ❖ **TRWD Projects:** None.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding, drainage along the international border, road washouts, crop and hay land flooding, water supply for livestock, maintenance of drainage ditches, insufficient channel capacities.
 - **Natural Resources Enhancements:** include habitat, water quality impairments, fish passage, and unstable stream flows, wind & water erosion, buffers.
 - **Other:**
- ❖ **Solution Alternatives:**
 - Construct/Improve/Maintain systems to 10 year runoff designs in accordance with RRFDRWG Mediation Agreement and MN Ditch Law.
 - Incorporate BMP's such as buffer strips, side water inlets, and grade stabilization structures on ditch systems to control erosion and improve water quality.
 - Utilize set back levees, impoundments, culvert sizing, permit conditions, conveyance methods, flood proofing and ring dikes where appropriate to prevent flood damages, stabilize flows and provide habitat.

Goals/Objectives/Action Items: Address downstream water quality impairments on NB Two Rivers; Identify eroding watercourses and target for BMP cost share; Promote & maintain buffers and enforce buffer law where applicable; Work with Kittson County to evaluate KCD 22 for stabilization and erosion control; Identify potential storage areas and utilize culvert sizing and other water storage methods to reduce flood volumes and evaluate drainage capacity

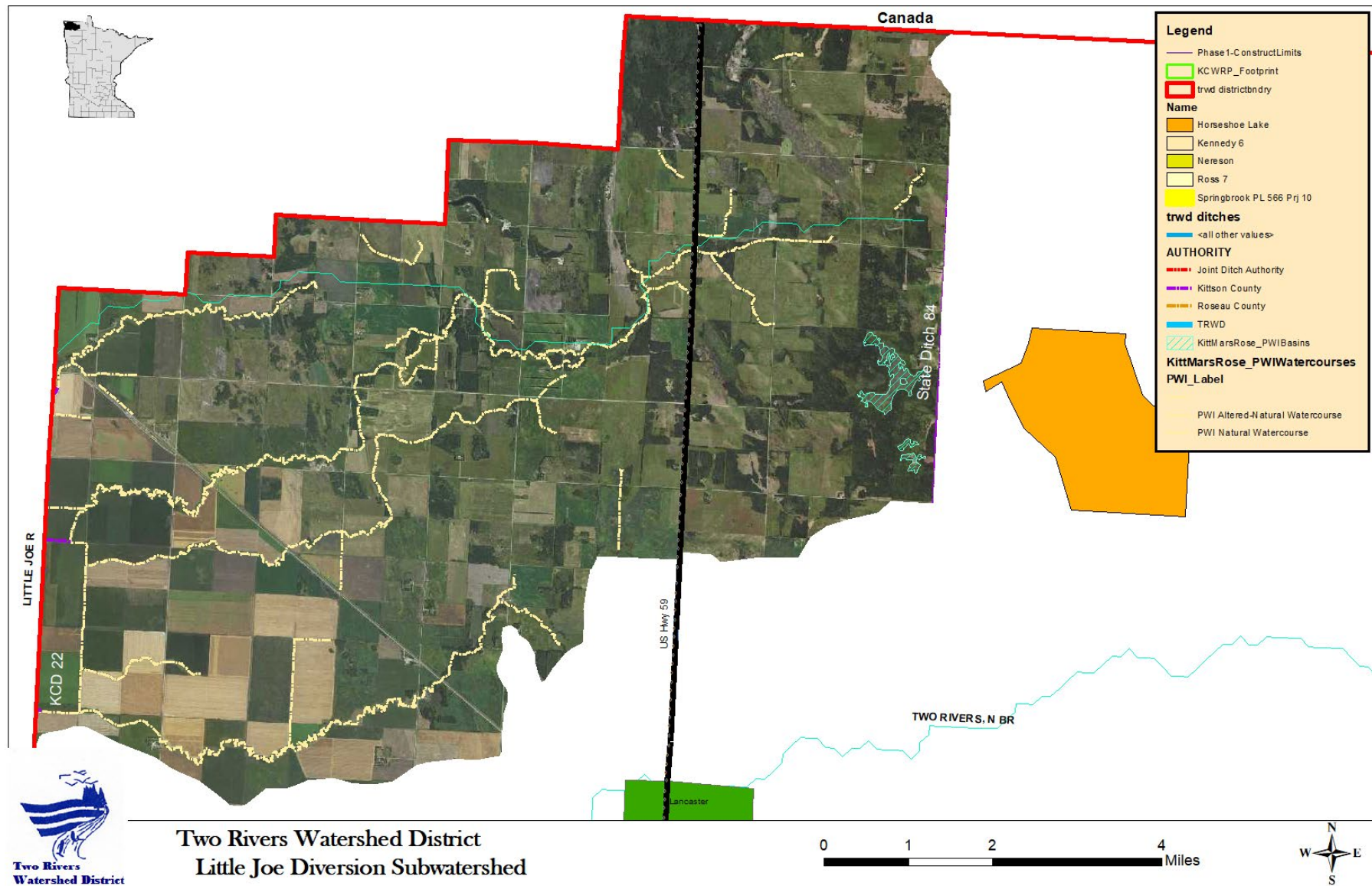


Figure 21.0

Two Rivers Main Stem Planning Zone

- ❖ **Description:** This area is approximately 60 square miles in size and comprises the drainage area of the South Branch Two Rivers from Hallock to the Red River. The landscape is characterized mainly by intensively farmed, highly productive cropland. Topography is relatively flat, approximately 40 feet of fall from the City of Hallock to the Red River of the North.
 - **Cities:** Hallock
 - **Runoff Timing Zone:** Early
- ❖ **Legal Drainage Ditches:** *Kittson County:* KCD 12, KCD 25 *TRWD:*KCD 21
- ❖ **Other Watercourses:** A few unnamed coulees connect to the South Branch Two Rivers.
- ❖ **TRWD Projects:** None
- ❖ **Other Structures:** Various BMP's such as grade stabilization and side water inlets have been installed to address erosion issues.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Large scale flooding associated with the Red River of the North, road washouts, cropland flooding, maintenance of drainage ditches, insufficient channel capacities / drainage issues,
 - **Natural Resources Enhancements:** wind & water erosion, buffers, habitat, water quality impairments on S. Br. Two Rivers, fish habitat, and unstable stream flows.
- ❖ **Solution Alternatives**
 - Construct/Improve/Maintain systems to 10 year runoff designs in accordance with FDRWG Mediation Agreement and Ditch Law; Incorporate BMP's to control erosion and improve water quality; Review Tech Papers #3 and #11 relative to FDR & NRE initiatives;
- ❖ **Goals/Objectives/Action Items:**

Continue water quality monitoring to address water quality impairments; ID eroding watercourses and target for BMP cost share; Promote, install and enforce buffers where applicable;

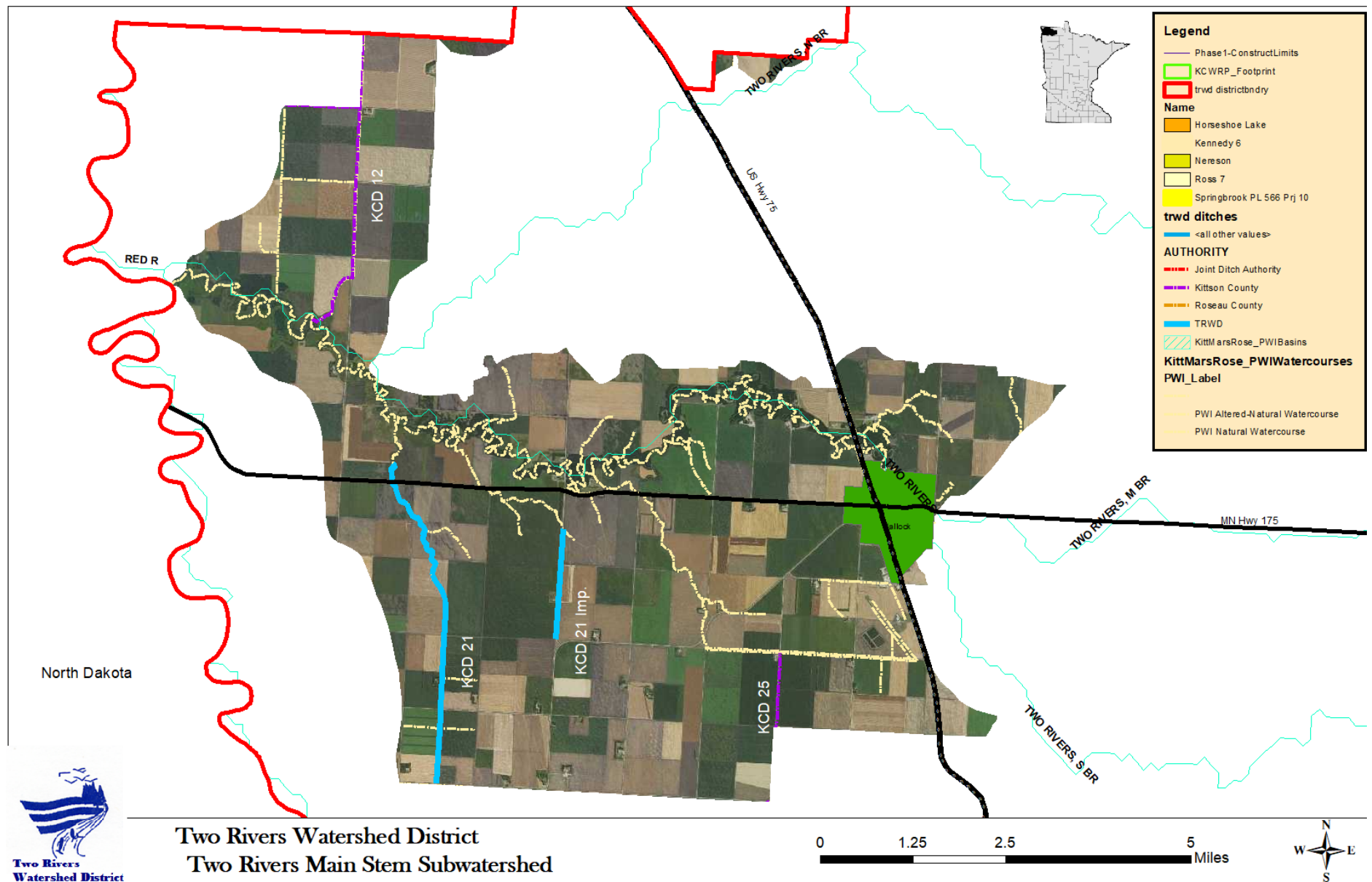


Figure 22.0

Direct to Red River Sub-Watershed

- ❖ **Description:** This planning zone is approximately 107 square miles in size and comprises the area drains directly to the Red River. The zone consists of predominantly cultivated agricultural land. The riparian area along the Red River is wooded. Topography is extremely flat in this zone, at times less than 2 feet per mile.
 - **Cities:** None
- ❖ **Legal Drainage Ditches:** KCD 26
- ❖ **Other Watercourses** include a network of intermittent coulees connected to the legal drainage ditches. The Red River of the North impacts this subwatershed. Also of note, the mouth of the Two Rivers and the mouth of the JD 10 and unnamed coulees outlet into the Red River in this area.
- ❖ **TRWD Projects:** Numerous farmstead ring dikes were built in the late 1990's and 2000's.
- ❖ **Common Issues:**
 - **Flood Damage Reduction:** Overland flooding; Red River flooding; Road/culvert overtopping and wash outs; maintenance of drainage ditches;
 - **Natural Resources Enhancements:** Severe erosion and sloughing along watercourses; wind erosion, buffers, stabilize flows, habitat corridors
- ❖ **Solution Alternatives:**
 - Construct/Improve/Maintain systems to 10 year runoff designs in accordance with RRFDRWG Mediation Agreement and MN Ditch Law.
 - Incorporate BMP's such as buffer strips, side water inlets, and grade stabilization structures on ditch systems to control erosion and improve water quality.
 - Utilize set back levees, impoundments, culvert sizing, permit conditions, conveyance methods, flood proofing and ring dikes where appropriate to prevent flood damages, stabilize flows and provide habitat.

Goals/Objectives/Action Items: Identify eroded watercourses and target for BMP cost share; Promote & maintain buffers and enforce riparian buffer law where applicable; Identify at risk farmsteads and target for ring dikes; identify vulnerable infrastructure to target for flood proofing or protection; Inspect ditches and watercourses to identify any maintenance needs; work with NWS, USGS, DNR and others to maintain flood watches and warnings;

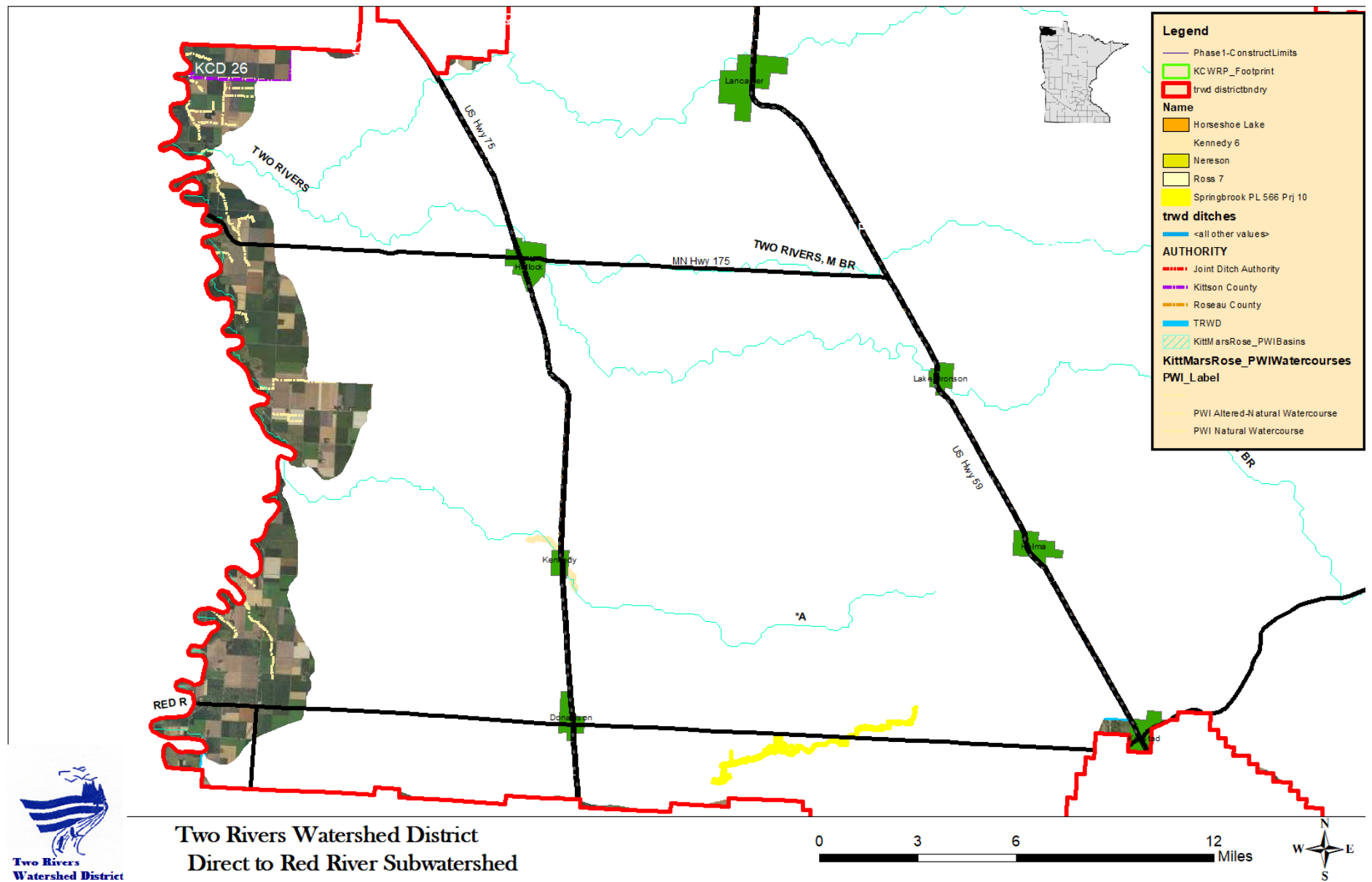


Figure 23.0

Project Identification & Investigation

Since its inception in 1957, the TRWD has researched, planned and implemented numerous projects. The map below depicts the flood impoundments, water management projects, and legal ditches that have been constructed, operated and maintained by the District. In addition to these project, assistance has been given to local landowners through the implementation of a ring dike program that designed and constructed 24 farmstead ring dikes to provide protection from flooding.

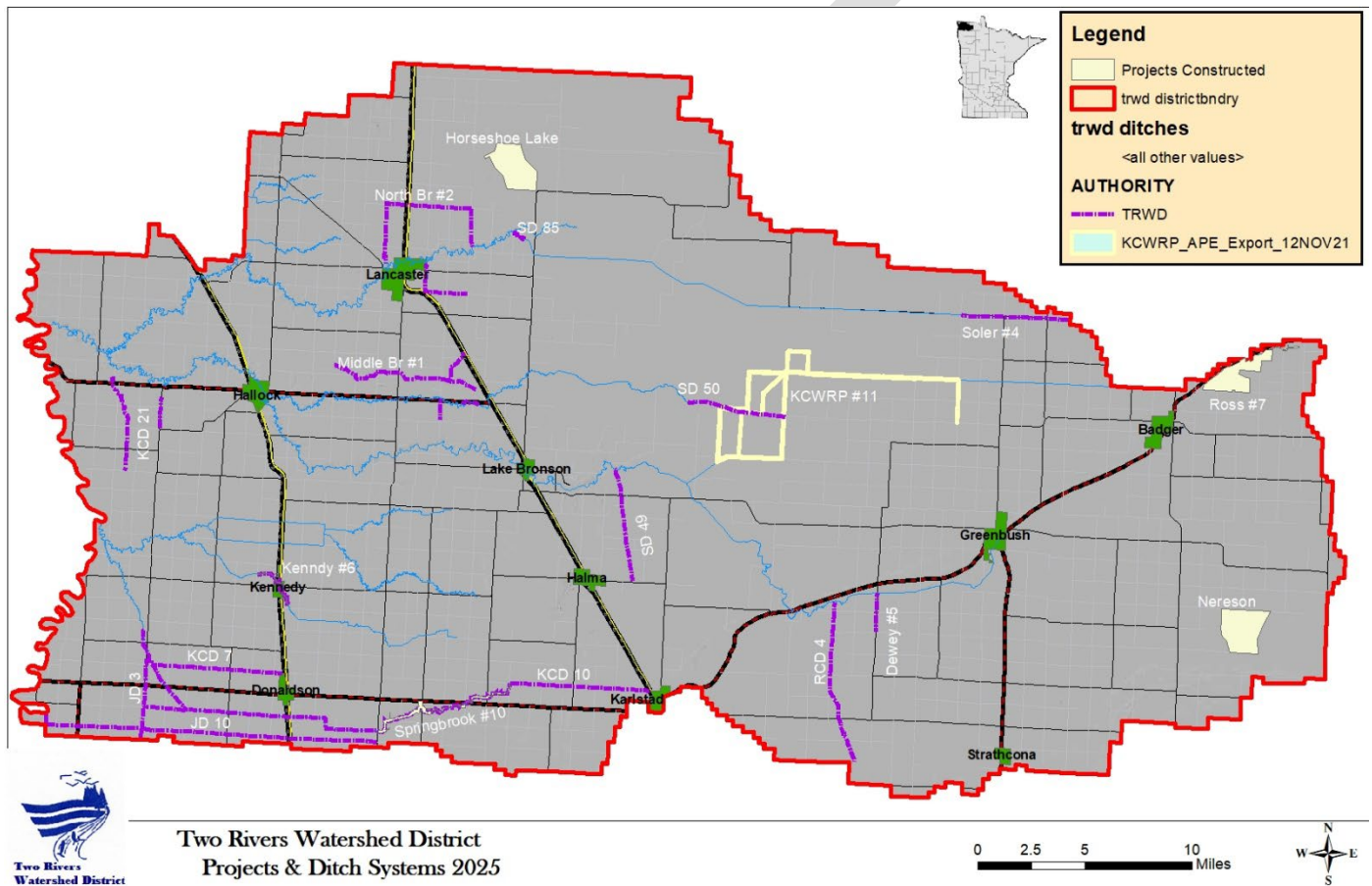


Figure 24.0

Existing & Completed Projects: – Authorized under MN Statute 103D

Table 3.0 below shows established projects of the Two Rivers Watershed District. They were built under Minnesota Statute 103D for various purposes including flood control, erosion control, water quality benefits, wildlife enhancement, and drainage for agricultural lands. Each is inspected annually and operated and maintained by the TRWD.

Detailed information regarding each project is on file at the TRWD office. Interested individuals can obtain copies of all project information upon request.

Project Name	Description	Location	Established	Status & 2026 Levy
Middle Branch Project #1	9.0 mile channel improvement	Thompson & Hazelton Townships, Kittson Co	1968; PL 566	Yearly Inspection & Maintenance ; \$5,000
North Branch Project #2	11.8 mile channel improvement	Richardville, St. Joseph, Granville, & Poppleton Townships, Kittson Co.	1969; PL 566	Yearly Inspection & Maintenance ; \$17,000
Soler Project #4	5 mile extension of State Ditch #72	Soler & Moose Townships, Roseau Co.	1979; Petition Project	Yearly Inspection & Maintenance ; \$0
Dewey Project #5	1.8 mile lateral to State Ditch #91	Sections 26 & 35 Dewey Township, Roseau Co.	1980; Petition Project	Yearly Inspection & Maintenance; \$NA
Nereson Impoundment Project	Flood Control Impoundment	Sections 27-28 Nereson Township, Roseau Co	1981; Board Initiated	Yearly Inspection & Maintenance; \$NA
Nereson Modification Project	Flood Control Impoundment	Sections 33-34 Nereson Township, Roseau Co	2005; Board Initiated	Yearly Inspection & Maintenance; \$NA
Dewey 5 Improvement Project	Improvement of Dewey #5 Ditch System	Sections 26 & 35 Dewey Township, Roseau Co	2002; Petition Project	Yearly Inspection & Maintenance; \$0
Horseshoe Lake Project	Drawdown Structure	Section 14, St. Joseph Township, Kittson Co	1968; Modified 2006; Jointly by Kittson Co, DNR, & TRWD	Yearly Inspection & Maintenance; Gate Operation; \$NA
Kennedy Project #6	2.6 mile ditch to connect Kittson CD4 & CD27	City of Kennedy, MN	November 2009; Petition Project	Yearly Inspection & Maintenance \$6,250
Ross Project #7	Flood Control Impoundment	Sections 26, 27, 28, 32, 33,34, Ross Township, Roseau Co	November 2007; Board Initiated	Yearly Inspection & Maintenance; Gate Operation; \$NA
Springbrook PL566 Project #10	Set back dikes and Side water inlets along 8.65 miles of waterway	Springbrook Township sections 22,23,28,29,30; Davis Township sections 25,36	December 2013; Petition Project	Yearly Inspection & Maintenance \$18,733

Table 3.0

Potential & Proposed Projects

Klondike Clean Water Retention Project: This is a multipurpose flood control, water quality improvement, and habitat protection/enhancement project. Planning began in 2009 and a Project Work Team met until about 2015. The TRWD officially made it a project in 2017 and since that time all land rights have been obtained, 17 permits have been approved, partial funding has been approved, detailed engineering plans and specifications have been written, and construction of Phase 1 has begun. The TRWD has secured about 60% funding and is still seeking funding for the remaining 40%.

The project has been broken into 3 phases and each, when completed, will provide an operable project with varying levels of benefits. Phase 1 construction began in 2026, and when completed it will provide over 15,250-acre feet of floodwater storage, reduce sediment, phosphorous and nitrogen loading to the south and middle branches of the Two Rivers, protect and enhance a prairie rich fen, and provide improvements to aquatic

habitat. Subsequent phases 2 and 3 will provide up to a total of 35,000-acre feet of flood storage along with additional natural resources benefits.

Funding for constructing this project has been partially approved, and the TRWD is actively seeking further funding through local, state, and federal sources.

State Ditch 91, Unnamed Coulee, and JD3/JD10 Subwatershed Studies– The TRWD is considering the formation of a project work team to identify flood damage reduction and natural resources enhancement opportunities within these 3 subwatersheds. Through the Flood Damage Reduction Work Group a model of the 10 year floodplain will be developed for these areas which can be used by a project team to analyze a range of potential solutions. This is a future item that will be further discussed when information becomes available.

Ditch Systems:– Authorized under MN Statute 103E

The following ditches were established under MN Statute 103E, the ditch law. Most were originally established between 1900 and 1920. Under the statute ditches are either managed by a county or a watershed district. However, if a new ditch is being petitioned or being petitioned to be improved then the petition goes to the watershed district. The statute also provides a process whereby ditches can be turned over by a county to a watershed district. Therefore the ditches listed below are under the jurisdiction of the TRWD.

Legal Ditches Statute 103E	Length (Miles)	Township(s); County	2026 Levy
State Ditch #49	5.25	Norway; Kittson Co	\$ 5,000
State Ditch #50	4.5	Klondike; Kittson Co.	\$ 1,500
State Ditch #85 Improvement	0.75	Poppleton; Kittson Co	\$ 0
Judicial Ditch #3	5.5	Teien; Kittson Co	\$ 0
Judicial Ditch #10	31	Davis, Svea, Teien, Kittson Co	\$ 15,300
Kittson CD #7	6.5	Svea; Kittson Co	\$ 0
Kittson CD #10	7.0	Deerwood; Kittson Co	\$ 5,000
Roseau CD #4	7.5	Lind, Dewey; Roseau Co	\$25,000
Kittson CD #21 & KCD 21 Improvement	6.5	Hallock, Kittson Co	\$ 0

Table 4.0

For all projects and ditches, the TRWD maintains a dynamic inspection and maintenance schedule. Each system is visually inspected annually, inspection reports are filed, and any maintenance activity is undertaken. Each system is fully surveyed (grade and cross sections) once every 5 years. These inspections and surveys help determine maintenance needs and tax levies that need to be assessed to pay for the maintenance. Activities include beaver and beaver dam removal, vegetation spraying to remove woody vegetation, cattails and noxious weeds, erosion control and repair, and

mechanical removal of accumulated sediment. District staff perform the annual inspections and the Board of Managers approves the work to be completed.

Currently one ditch project is proceeding through the ditch improvement process. The TRWD received a petition from landowners to improve Kittson County Ditch #13. A project engineer provided a report, and viewers provided a viewer's report. A public hearing was held, and the project was approved by the Board of Managers. It is expected this project will proceed to construction in 2027.

Potential Transfer of Ditch Systems - Minnesota's Watershed Law contains a process that allows counties and joint drainage authorities to turn over authority (operation and maintenance) of existing legal ditches to a watershed district. The TRWD currently is the ditch authority for 9 of these systems, 6 of which are in Kittson County, 1 which is in Roseau County, and 2 that are in parts of multiple counties. Over time, counties have indicated a desire to turn over certain ditch systems to the TRWD. An ongoing action item is to continue discussions with drainage authorities and landowners and utilize the appropriate section of watershed law if deemed prudent.

Several ditches within Kittson County are of a priority to transfer county to TRWD management. These include Judicial Ditch #31, State Ditch #84 and State Ditch #85. These three ditches all have part of them currently managed by both Kittson County and by TRWD. A transfer would simplify inspection and maintenance activity and would designate management by only 1 entity and not 2, reducing confusion. Other ditches may be considered for this process in the future on a case by case basis.

Miscellaneous Studies, Investigations, & Inventories

During the course of this and prior plan updates, the TRWD has noted the importance of monitoring and data collection in order to help the Board of Managers make wise management decisions. The following monitoring and data collection activities are proposed for the next 10-year planning cycle.

Water Quality Monitoring Program - The Two Rivers Watershed District (TRWD) has historically performed monitoring of baseline water quality conditions within its boundaries. This monitoring program dates back to its inception in 1991. Monitoring has not necessarily been done continually each year, rather it has been done intermittently as needed. It has not typically been done in years when the MPCA or other entities have done intensive monitoring.

The purpose of the monitoring program is to monitor base line conditions on the rivers, streams, and ditches within the TRWD. TRWD monitoring data is collected not only to provide baseline data, but also to fill in gaps in data and coordinate with other agencies. Water samples are collected and sampled for a range of parameters including but not limited to pH, dissolved oxygen, transparency, conductivity, nitrogen,

phosphorous, E-coli, temperature, and total suspended solids. This information will help to inform the TRWD with its short- and long-range planning activities relative to maintenance of ditch systems, operation and maintenance of projects, and installation of erosion control measures.

Stream Gaging / Monitoring Program - Twenty-eight sites within the watershed have been developed for stream flow monitoring. A staff gage is erected at each site, and periodically during runoff events, flow is measured using a flow meter. District staff uses staff gage reading and data loggers to record daily water level measurements. This process records the volume of water that passes through each monitoring site and the velocity of the water. This information is extremely valuable for predicting flood events and also for modeling stream flows. Eventually a rating curve will be developed for each site and a hydrologic flow model will be developed for the District.

Since the inception of this monitoring program in 1996, the District has collected a significant amount of data and has been documenting how water moves through the intricate system of field ditches, road ditches, legal ditches, coulees, streams, river channels and other waterways from upstream to downstream.

Snow Survey - Each year during the month of February or March, the District performs a snow survey at 10 sites within the District. This survey consists of sampling the snow column and recording the depth of snow and the water content. This information is vital to helping predict the amount of runoff that each area of the District will produce during the spring runoff. The information is recorded and forwarded to the National Weather Service to be included in their database and used in their spring flood forecasts.

10 year ditch capacity analysis – One of the mediation agreement goals is to provide enough capacity in ditch systems to carry the 10 year runoff event, which is roughly a 3.5” to 4” rainfall within a 24 hour period. It is currently unknown how many legal ditches are at or above this level. This initiative will focus on 73 miles of legal ditch systems (MN Statute 103E) of which the TRWD is the ditch authority, and provide data and information that can be used to improve upon agricultural drainage and flood damage reduction while at the same time attending to natural resources enhancements and water quality and erosion problems.

Updated Culvert Inventory – The TRWD’s current culvert inventory was completed in the late 1990’s and early 2000’s and is currently over 25 years old. Survey and mapping technology has greatly improved in this time, and many culverts on the landscape have changed as well. It is evident that this unique and valuable inventory is in need of updating. The data is invaluable in determining water flow paths, reviewing permit applications, designing projects, and analyzing how water moves through each subwatershed. Therefore, the TRWD intends to undertake the update of this culvert inventory during the course of the next plan update cycle.

10 year floodplain mapping – Another of the mediation agreement goals is to protect agricultural land and infrastructure from the 10 year flood event. Through a grant from FEMA, the Flood Damage Reduction Work Group is currently developing a model to be able to predict the 10 year floodplain. Within the TRWD, nearly 700 square miles will be examined within the SD 91, SD 95, JD 10 and Unnamed Coulee subwatersheds. This is anticipated to be completed by the end of 2027.

Subwatershed Outlet Adequacy – During the planning process, the TRWD Board of Managers identified a need to analyze each of the subwatersheds to consider the capacity of their outlet(s). To do this, the Board will consider forming project work teams in the SD 91, JD 10 and Unnamed Coulee subwatersheds. This will begin with the 10 year flood plain modelling project. Once that is complete a project team will be formed to dive deeper into flood damage reduction and natural resources enhancement issues and opportunities. The idea is that once a purpose and need statement is produced, a series of solution alternatives can be analyzed and a plan put forth for potential projects to help solve the problems.

TRWD Funding

The TRWD has levy authority and follows MN Statute 103D in establishing an annual levy. Each year a budget is developed and a public hearing is held to establish administrative, ditch and project levies which are then certified to each county in September of each year. As a member of the Red River Watershed Management Board, an additional levy is authorized by that board. By law, $\frac{1}{2}$ of that levy is kept for local projects and $\frac{1}{2}$ is forwarded to the RRWMB for regional projects. Other funding sources may include local, state, and federal grants, charges for services, permit inspection fees, and interest income on investments.

The following diagram generally depicts the tax levy income structure of the TRWD.

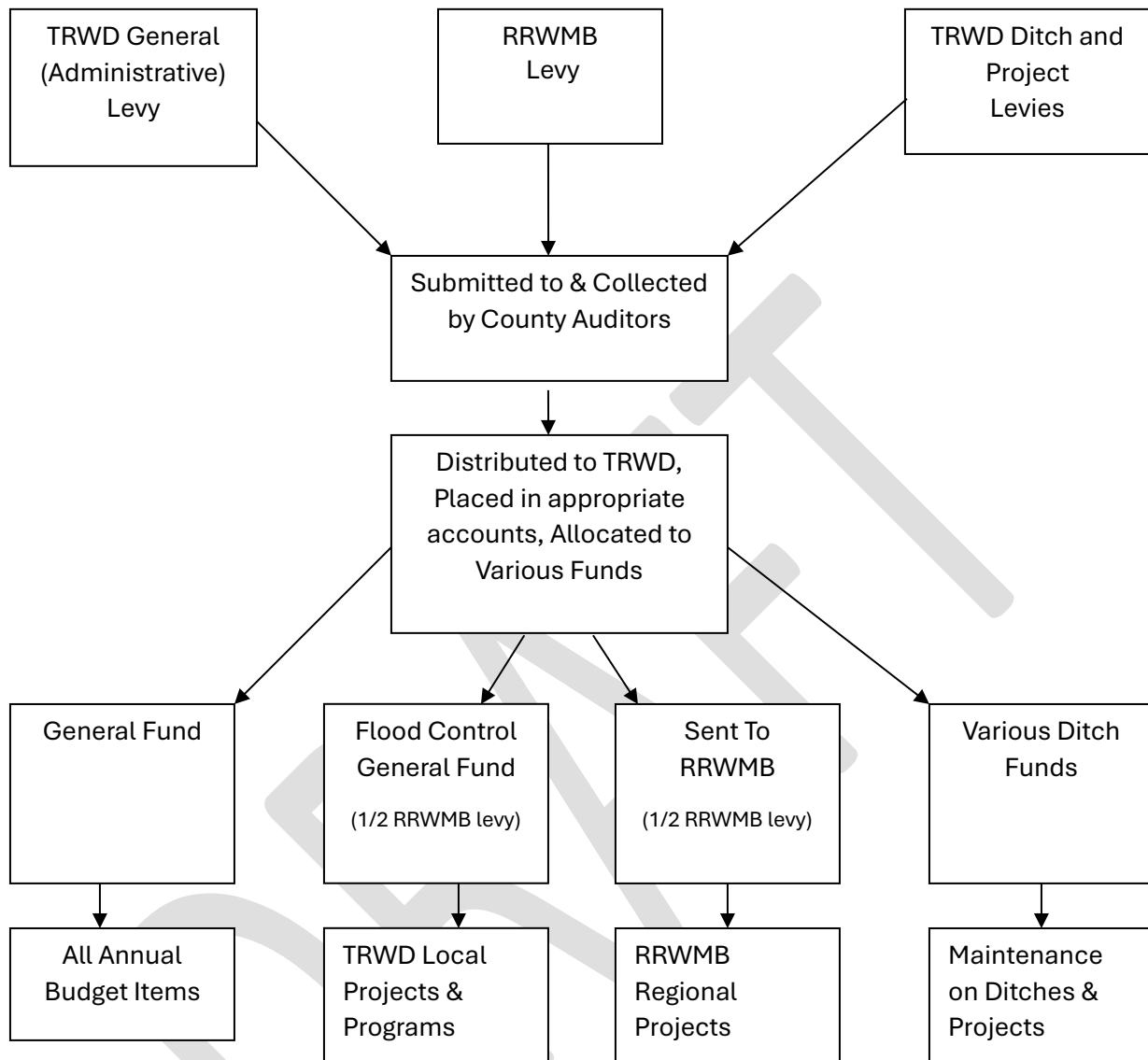


Figure 25.0

Regulation of Activities by TRWD – RULES OF THE TRWD

The *Rules of the Two Rivers Watershed District* were originally adopted in 1981. They have undergone amendments in 1997, 2015, and in 2017. These rules were written under the authority of Minnesota Statute Chapter 103D and govern projects which have a potential effect on the water resources of the District and specifically relate to drainage, flood control, water use, and water quality. Projects of this nature require a permit from the Two Rivers Watershed District before any work is done.

Projects Requiring a TRWD Permit

The Two Rivers Watershed District adopted *Rules* in 1980 & amended them in 1997, 2015, & 2017. These *Rules* govern projects which have a potential effect on the water resources of the District and specifically relate to drainage, flood control, water use, and water quality. Projects of this type require a permit from the Two Rivers Watershed District before any work is done. There is no charge for the permit, however projects which are commenced or completed without a permit will require a \$500 fee, plus field inspection fees and potential mitigation measures. Some specific works that require permits are listed below. A complete set of *Rules* and a permit application form can be obtained at the District office in the Kittson County Courthouse in Hallock, MN.

- (a) Any sanitary sewer system which discharges to surface water, storm sewer, or other major utility project which affects surface water within the district.
- (b) Any street, road, or highway construction project which by means of its construction has any effect on the quality or quantity of water runoff.
- (c) Any construction or alteration of any drain tile or drainage ditch that drains an area in excess of 20 acres.
- (d) Any works which include draining, filling, excavating, or dredging of any type 3, 4, 5, or 8 wetlands as defined by the U.S. Fish & Wildlife Service Circular 39.
- (e) Any construction or alteration of any bridge, dike, culvert, or drain across any drainageway, lake, wetland, or other water body.
- (f) Any artificial or mechanical transfer of water from a water source including but not limited to gravel pits, ponds, rivers, wetlands, and other reservoirs consistent with the general purposes of the District.
- (g) Any artificial drainageway cut across a subwatershed to thereby deliver water into another subwatershed.
- (h) Any drainage of water by any artificial means into any legal drainage system from any land not assessed to that drainage system.
- (i) Construction, alteration, or removal of any dike or reservoir.

(j) Any other acts that, in the opinion of the Watershed District, may tend to alter the quantity of runoff, affect the public health, or have any impact, whether adverse or not, upon the surface water or ground water resources of the district.

When reviewing permits, pertinent Board policy and general guidelines are used. Some of these policies and guidelines are listed below, all are kept on file and each are considered carefully on a case by case basis.

- Adequacy of outlet – does the outlet to the proposed project have sufficient capacity to receive flows that are coming to it.
- Culvert Sizing Policy – generally culverts are sized to be able to carry the 10 year – 24 hour runoff event (about 3.5” to 4.0” in a 24 hour period) and drain adjacent fields within 24 – 48 hours. Criteria to consider when choosing the appropriate size include upstream drainage area, slope, proximity to buildings, road overtopping concerns, and other items on a case by case basis.
- Tile Drainage Policies – a list of “Tile Reasonable Use Factors” was adopted by the Board of Managers on 8/1/24. These are considered for every tile permit application that is reviewed. Immediately affected downstream landowners are notified and given opportunity to comment.
- Ditch Maintenance vs. Improvement – Policy was adopted by the Board of Managers on 5/6/16 to help determine whether work in public or private ditches is viewed as maintenance and not needing a permit or as improvement which would need a permit.
- General Permits – These pertain to culverts that are on or within a Federal, State, or County road right of way. The general permit was adopted on 8/3/23 and set the criteria used to make a determination if a project falls under a general permit.
- Side Water Inlets – This policy sets criteria for side inlets to ditches and waterways that use culvert. A side inlet culvert is allowed a flap gate only if the culvert complies with the District’s culvert sizing policy. A larger size side inlet culvert can be approved, however in that case a flap gate is not allowed on the culvert.
- Right of Way – structures within a road or ditch right of way or on lands that have some sort of temporary or permanent easement must be in compliance. Road and Ditch authorities that are affected are notified and given opportunity to comment.

Other considerations include whether a project moves water from one subwatershed to another, does the project solve or mitigate a problem, have all other possible options been considered, does project transfer a problem to another area or downstream, is there any opposition to a project, and are all TRWD policies followed.

The District keeps a detailed record of all permits issued including paper files, electronic spreadsheet, and geographic information system. All permit locations are mapped and the data base is updated as permits are issued.

Information & Education

RIVER WATCH

The District promotes the River Watch program with local schools and organizations to implement water quality monitoring on the North, Middle, and South Branches of the Two River. This program provides real world, hands on experience for high school students with regard to water sampling, water chemistry, and aquatic biology. Students collect water samples and then test them for nitrogen, dissolved oxygen, conductivity, pH, phosphorous, and other parameters. This activity provides useful water quality data for the District and provides hands on experience for students. Through its membership in the Red River Watershed Management Board, the TRWD supports the International Water Institute with their implementation of this program.

ENVIROTHON:

This outdoor, hands on, learning event for high schoolers is coordinated by Soil u Water Conservation Districts and held annually either at Lake Bronson State Park or at the Agassiz National Wildlife Refuge. TRWD staff assist with the planning, organization, and presentations at the event. Schools within the area of the TRWD typically participating included Kittson Central, Badger- Greenbush-Middle River, and Tri County, among others.

PUBLIC INFORMATION & DISSEMINATION:

The District periodically produces newsletters and news releases and submits them to both print and electronic media outlets. In addition, information is occasionally sent to individuals via email and US mail. Articles contained in these publications relate to District programs, activities, flood control, water quality, habitat and other water management and conservation issues.

FLOOD STATEMENTS:

During spring snowmelt and also during runoff events from summer storms, the District publishes and sends out a daily flood statement. This document contains river stage and crest information collected from the stream flow and stream monitoring network. The document is distributed to media, government agencies, and general public upon request.

Resources for Coordination, Cooperation & Conflict Resolution With Other Entities

EARLY COORDINATION

The TRWD recognizes that for most projects, early coordination between all local - state-federal stakeholders, individuals, agencies, and non-government organizations can

be a meaningful tool in navigating the labyrinth of plans, rules, regulations and other laws that could apply. Projects that identify the problem to be solved, consider a potential range of alternatives to consider, and provide a process to determine one or more preferred alternatives usually leads to sound solutions. All local, state and federal rules, laws and other regulations must be followed, and numerous planning processes should be considered. The TRWD endorses the 1998 Mediation Agreement and documents produced by the Red River Basin Flood Damage Reduction Work Group (FDRWG).

The following is a listing of some of the sources of information and organizations that should regularly be consulted.

- Kittson, Roseau and Marshall County All Hazards Plans at <https://kittson-county-hmp-umn.hub.arcgis.com/> ; <https://roseau-county-hmp-umn.hub.arcgis.com/> ; <https://marshall-county-hmp-umn.hub.arcgis.com/>
- Two Rivers Plus 1W1P at <https://www.tworiversplusjpb.org/the-plan>.
- Other sources of information
 - Drainage in MN at <https://bwsr.state.mn.us/drainage-minnesota>.
 - FDRWG at <https://www.rrwmb.us/fdrwg>
 - Red River Valley “Long Term Flood Solutions” document at <https://www.redriverbasincommission.org/long-term-flood-solutions>
 - MN DNR – Two Rivers Fisheries Management Plan (2024)
 - MPCA - Watershed Restoration and Protection Strategies (WRAPS) Reports and associated studies, for Two Rivers and Lower Red River watersheds at <https://www.pca.state.mn.us/watershed-information/two-rivers> and at <https://www.pca.state.mn.us/watershed-information/lower-red-river-red-river-of-the-north-tamarac-river>

Some additional pertinent materials on natural resources as of 2020 were identified by the FDRWG and are listed below. In time, these will likely be superseded by newer material. The FDRWG recommends that project teams and others participating under the Mediation Agreement routinely seek updated information while advancing the goals listed in Part III.

Relevant Publications and Web Sites:

Statewide Plans on Specific Resource Types (State agency staff assigned to project teams can assist in identifying the most relevant information for a given project and its watershed.)

- Minnesota Prairie Conservation Plan (MnDNR 2018)
- Minnesota Wetlands Conservation Plan (MnDNR 1997)
- State Wildlife Action Plan (MnDNR, 2015)
- Other statewide wildlife plans: Duck Plan; Elk Plan, Pheasant Plan, Wild Turkey Plan
- The Northern Tallgrass Prairie Ecoregion Plan (The Nature Conservancy, 2004)
- Aspen Parkland Subsection Forest Management Plan (MnDNR 2011)
- Fish Habitat Plan: A Strategic Guidance Document. (MnDNR 2013)
- Shallow Lakes Program Plan (DNR 2010)
- Impaired Waters Listing and TMDL Plans (MPCA 2020)
- Development of a Fish-Based Index of Biological Integrity for Minnesota's Rivers and Streams (MPCA 2014)
- Minnesota Nutrient Reduction Strategy (MPCA 2014)
- Minnesota's Nonpoint Source Management Program Plan (MPCA 2013)
- Minnesota Agricultural Water Quality Certification Program
- Pesticide Management Plan (MDA 2007)
- Parks and Trails Legacy Plan (DNR 2011)
- Data and research products from Minnesota Climatology Office (DNR):
<http://climateapps.dnr.state.mn.us/index.htm>
- Minnesota State Water Plan
- Minnesota Water Sustainability Framework (WRC UM 2011)
- Multipurpose drainage management resources at
<https://bwsr.state.mn.us/otherdrainage-resources>
- Native vegetation establishment and enhancement guidelines at
<https://bwsr.state.mn.us/vegetation-establishment-and-management> (use generally required for any projects funded by LSOHC or CW fund)
- Technical design documents for wetlands at
<https://bwsr.state.mn.us/guidancedocuments-tools-and-other-resources>
- General guidance on habitat establishment and management available at
<https://bwsr.state.mn.us/habitat-establishment-management-resources>
- Red River of the North Fisheries Management Plan 2017 - 2027, prepared by resource agencies in MN, ND, SD and Manitoba.
- Restoration Of Extirpated Lake Sturgeon (*Acipenser Fulvescens*) in the Red River Watershed – Phase Two (2019-2029)

Minnesota's DNR, BWSR, MPCA, MDA, MDH, HSEM and other agencies also have extensive information posted on their web sites covering various aspects of flood damage reduction and natural resources enhancement. In addition, regional agencies like the RRWMB, RRRRA, RRBC, and IWI have a plethora of information on regional Red River planning initiatives and information data bases.

The TRWD also recognizes that not all entities can be completely satisfied and that water conflicts can and do occur. If a conflict happens, there are several dispute

resolution avenues that can be pursued to amicably settle differences. These include but are not limited to the FDRWG mediation agreement process and the MN Board of Water & Soil Resources dispute resolution process. If issues come up that are difficult to resolve, these and other available resources will be utilized.

Summary Statement of TRWD Policy & Commitment

The Two Rivers Watershed District shall abide by the following general policies, as stated and carried forth from the 1970 Overall Plan and subsequent plan revisions:

1. It shall be the policy of the Watershed District to cooperate with and utilize all help available from any state or governmental subdivisions thereof; from any Federal agency; private or public corporation or person. When considered desirable, the Managers of the Watershed District shall enter into a memorandum of understanding with said agencies and subdivisions of government.
2. The Managers of the District shall become acquainted with all existing water problems and programs and shall secure maximum assistance so as to reduce the assessments on local lands.
3. All projects which are to be paid by assessment upon benefited properties, shall be instituted only upon filing of a valid petition with the Managers.
4. The Managers shall not approve a petition for work unless the following facts are found to exist:
 - a. That the proposed improvements are for the public interest and welfare as defined by the Minnesota Watershed Act, Minnesota Statute Chapter 103D.
 - b. That it is practical and in conformity with the District's current Overall Watershed Management Plan.
 - c. That the total benefits are greater than the total estimated costs and damages.
 - d. That the proposed project complies with the provisions and purposes of the Minnesota Watershed Act.
5. The Managers shall conscientiously ascertain the benefits to be derived from a proposed project. Assessments on individual property shall be based upon such benefits.
6. The Managers shall conserve and manage the supply of water in the District for the beneficial use of said water for domestic, industrial, agricultural, recreational, wildlife, and other public uses.
7. Before approving any project, the Managers shall carefully consider the effect of the contemplated project on other areas and other interests within the District. They shall not approve drainage projects unless they are satisfied that the

proposed outlet and the waterway into which it discharges can satisfactorily handle the improved flows.

In addition to the above stated general policies, the District has assembled a policy manual, which states in detail all of the policies of the Two Rivers Watershed District as they relate to various items.

It is the intent of the Two Rivers Watershed District to carry out its duties identified under Minnesota Statute, Chapter 103D and Chapter 103E. In doing so, the District will work with local, state and federal units of government as well as private organizations, individuals, and the public to the best of its ability.

The foregoing Overall Plan offers a description of the Watershed District, its several problems, and contains suggestions as to possible solutions. However, it must be remembered that the District cannot undertake the task of solving the problems alone. The individual landowners in the District can and must take responsibility and institute specific projects by proper petition under Minnesota law. It must also be recognized that water management beneficial to the landowner is dependent upon the voluntary cooperation of each individual landowner within the District. In addition, other units of government and private organizations need to bring to the table their resources and expertise to help solve the problems.

The TRWD acknowledges that in doing water management and carrying out water management activities, not all entities will agree on projects. However, with early coordination and continued communication it is hoped that most projects can come to a consensus on a solution. It may not be that all can agree on all facets of a solution, but one where all parties "can live with it" may be an acceptable middle ground.

The Board of Managers can and will to the best of their ability correlate, assist, and see that the various projects are carried out, as required by law, to proper completion after the desire for improved conditions has been expressed by the respective landowners, units of government, private organizations, or other interested persons or parties of the Watershed District. If situations arise where agreement cannot be reached, dispute resolution will be sought out to hopefully find an amicable alternative.

The Two Rivers Watershed District desires to achieve a balance among the various existing water, conservation, wildlife and land use programs to fit its agricultural economy and environmental needs. It is the intention of the Board of Managers to extend to the local, state, and federal governments, all other political subdivisions of government, non-government organizations, and to all individuals complete cooperation and understanding, and to accomplish as nearly as possible, in the manner provided by law, the purposes for which the District was created.