Ramsey
Conservation District

COMPREHENSIVE PLAN
2017 - 2025

Approved by the Ramsey Conservation District Board of Supervisors on December 12, 2016 with Resolution 16-12-05

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I. INTRODUCTION

TO OUR COMPREHENSIVE PLAN

The Ramsey Conservation District (RCD) has developed this Comprehensive Plan in accordance with Minnesota Board of Water and Soil Resources (BWSR) requirements. This planning tool will guide natural resource management, environmental protection programs, and activities over the next eight years.

The plan identifies past RCD accomplishments and lists our objectives, strategies and actions through the year 2025. This end date was chosen because it will align with the One Watershed, One Plan approach of structuring water planning along the 81 major watershed boundaries by the year 2025. Future annual work plans will be developed with specific tasks to address the priorities and actions within this plan.

DISTRICT MISSION

"The Ramsey Conservation District conserves and enhances natural resources in Ramsey County by providing technical, financial, and educational support to residents, property owners, and state, local, and federal governmental agencies and environmental organizations."

Ramsey County's natural resources provide the industrial base, living space, drinking water, and recreational opportunities for more than a half million people. The major environmental problems we face can be traced to the effects urban land use has on our natural resources and the environment. The continued destruction and deterioration of these natural resources threaten the high quality of life in Ramsey County and require expensive restoration and remediation practices to sustain our quality of life. The RCD is an experienced, efficient, and inexpensive choice for natural resource protection and restoration.

II. BACKGROUND INFORMATION

Ramsey Conservation District (RCD), is a Soil and Water Conservation District (SWCD), and is a local, special-purpose unit of government responsible for natural resource protection and management within the geographic boundaries of Ramsey County. The RCD is a non-regulatory organization dedicated to the wise stewardship of soil, water, and habitat in Ramsey County.

The RCD is one of 89 SWCDs in Minnesota. SWCDs were organized with provisions, powers, and restrictions established in Minnesota Statutes, Chapter 40 and operating under Chapter 103C. SWCDs do not have taxing authority. To finance their programs, they rely on county support, grants from state, federal, and other agencies, and fee-for-service revenues. Donations to the RCD are tax-deductible.

The beginning of SWCDs can be traced to the 1930s and an ecological disaster known as the Dust Bowl. During this decade, severe dust storms plagued the Great Plains area. These storms were caused by the combination of severe drought and new mechanized farming methods, which plowed under native grasses and vegetation to make room for increased agriculture production. This displacement of deeply rooted and drought resistant vegetation also interrupted soil function for this important symbiotic ecosystem. After tens of thousands of families abandoned their farms, the federal government responded with the creation of the present day Natural Resources Conservation Service (NRCS) and conservation districts. There are approximately 3,000 conservation districts in the United States today working to develop solutions to local natural resource concerns.

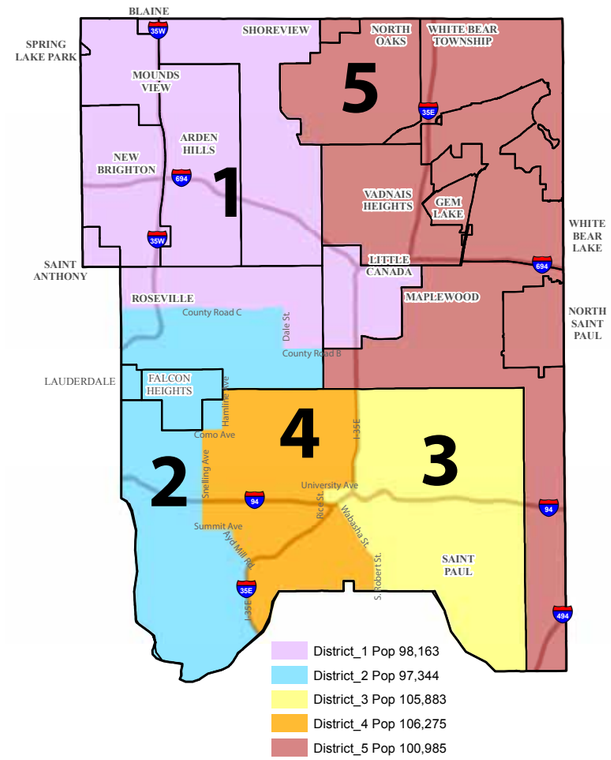
When conservation districts were first conceived in the 1930s, the principal concern was to reduce soil loss from agricultural lands. In Minnesota, SWCDs could not be formed in incorporated areas where non-agricultural land uses existed. Soil loss in non-agricultural areas was not recognized as an environmental problem till the late 1960's. In 1969, a modification of state law allowed the formation of SWCDs in incorporated areas such as Ramsey County. The citizens of Ramsey County petitioned for establishment of an SWCD. The Ramsey Conservation District was chartered on October 24, 1973.

GOVERNANCE

SWCDs are governed by an elected board of supervisors, whose responsibilities include setting policy, establishing priorities, and approving conservation projects, among other tasks. The Board meets for monthly board meetings and by state statute, the RCD Board of Supervisors is assigned to serve on the three largest WDs' Citizen Advisory Committees.

The board members are elected to four year terms. To maintain staggered election years, two board positions will be up for election in 2018. Historically supervisors were elected county-wide, with each supervisor representing a geologic area. As a result of a legislative change in 2014, all seven metro SWCDs are now required to have supervisors elected by district, rather than county-wide. As defined in State Statute 103C.311, these election districts must be substantially equal in population, compact, contiguous, and numbered in a regular series. In the 2016 general election, all of the RCD board members were elected based on these new election districts.

District	Supervisor	Term	Office
1	Paul Gardner	12/31/2018	Secretary
2	Gwen Willems	12/31/2018	Information & Education
3	Mara Humphrey	12/31/2020	Chair
4	Carrie Wasley	12/31/2016	Treasurer
5	Margaret Behrens	12/31/2020	Vice Chair



III. DISTRICT POLICIES

The RCD Board has adopted numerous policies to guide programing. The RCD maintains an Employee Handbook for the personnel policies and a Supervisor Handbook and By-Laws, which identify the powers and responsibilities of the RCD Supervisors. These documents are reviewed annually. In addition, the RCD staff follow BWSR's Erosion Control and Water Management Program and the Grants Administration Manual to direct the state funds awarded to the RCD.

Soil and Water Conservation Policy as established in Minnesota Statute (103C.005) is listed below:

Maintaining and enhancing the quality of soil and water for the environmental and economic benefits they produce, preventing degradation, and restoring degraded soil and water resources of this state contribute greatly to the health, safety, economic well-being, and general welfare of this state and its citizens. Land occupiers have the responsibility to implement practices that conserve the soil and water resources of the state. Soil and water conservation measures implemented on private lands in this state provide benefits to the general public by reducing erosion, sedimentation, siltation, water pollution, and damages caused by floods. The soil and water conservation policy of the state is to encourage land occupiers to conserve soil, water, and the natural resources they support through the implementation of practices that:

(1) control or prevent erosion, sedimentation, siltation, and related pollution in order to preserve natural resources;
(2) ensure continued soil productivity;
(3) protect water quality;
(4) prevent impairment of dams and reservoirs;
(5) reduce damages caused by floods;
(6) preserve wildlife;
(7) protect the tax base; and
(8) protect public lands and waters.

BWSR COST SHARE PROGRAM POLICY

Since 1978, the BWSR has operated a statewide cost-sharing program for the application of soil and water conservation practices. This program provides conservation practice funding to the SWCDs on an annual basis. The purpose of this program is to provide an economic incentive to private and public landowners for the proper installation and maintenance of permanent soil and water conservation practices. To qualify for an annual conservation practice cost-share grant, a district must identify areas of high priority erosion, sedimentation, and water quality problems.

Our highly urbanized land use patterns include large acreage of impervious surface areas and highly efficient stormwater conveyance systems (i.e., curb and gutter storm sewer systems). These practices subject all lakes and most larger wetlands to large amounts of non-point source pollutants.

Stormwater runoff is one of the most highly concentrated and contaminated sources of non-point pollution to our water resources. The RCD considers all lakes, wetlands, and waterways that receive stormwater runoff from disturbed soil areas and storm-sewered watersheds as most in need of protection and subject to chronic water-quality problems. Therefore, the RCD considers these areas as high priority for the acquisition of cost-share dollars.

Because urban runoff patterns usually increase runoff velocities and quantities, natural or newly constructed water conveyance systems are either severely eroded or subject to erosion. We also consider all natural water conveyance systems areas of high priority for cost-share practice protection.

To **protect water quality, implement proper land use** management practices, and prevent further environmental degradation, the RCD will use future cost share funds and other grant funding for technical staff to develop and implement the following natural resource conservation activities:

- Streambank, lake shoreline restoration activities
- Grade stabilization structures
- Critical area habitat restoration
- Steep slope stabilization and restoration
- Biofiltration and bioinfiltration treatment systems
- Abandoned/unused well sealing
- Hydrologic and geohydrologic analysis
- Pollinator habitat
- Retrofit practices installation and analysis
- Low-impact development best management practices
- Other existing, new, and/or innovative conservation practices/activities as approved by BWSR

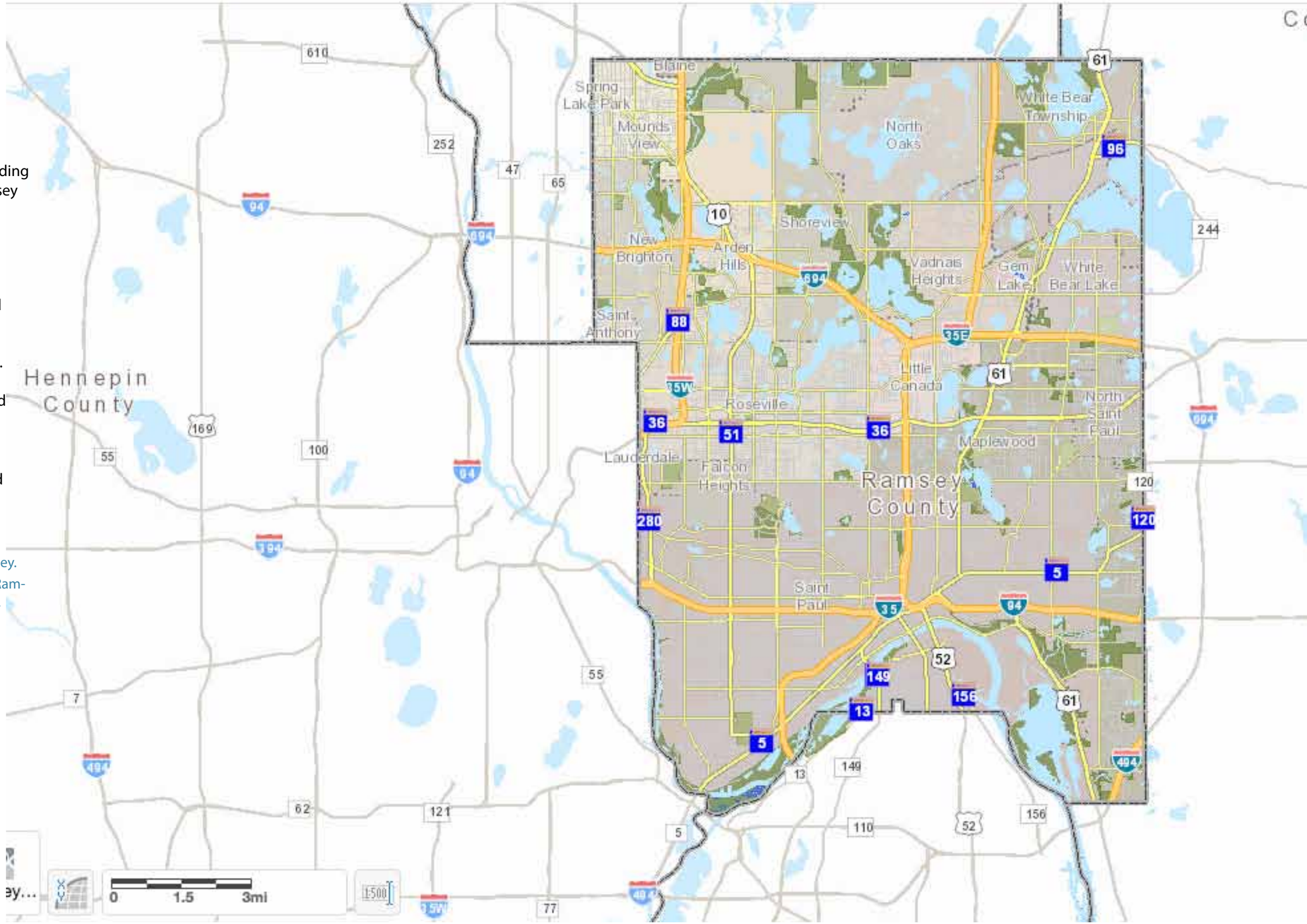
INTERACTIVE RAMSEY COUNTY PROPERTY MAP

"MapRamsey" is an interactive map providing a wide variety of information about Ramsey County, including:

- Property records such as tax parcels, classifications, valuations and other details.
- Aerial imagery including current and historic imagery and oblique views.
- Points of interest including schools, hospitals and government buildings.
- Environmental data, administrative boundaries, recreational features and more.

You can access MapRamsey with current versions of web browsers on desktop and mobile devices.

https://maps.co.ramsey.mn.us/Html5Viewer/index.html?configBase=https://maps.co.ramsey.mn.us/Geocortex/Essentials/REST/sites/MapRamsey/viewers/MapRamsey/virtualdirectory/Resources/Config/Default



IV. RELATIONSHIPS WITH OTHER ENTITIES

Links to Watershed Management Plans in Ramsey County

Capitol Region Watershed District

Lower Minnesota River Management Organization

Lower Mississippi River Management Organization

Mississippi Watershed Management Organziation

Ramsey Washington Metro Watershed District

Rice Creek Watershed District

Vadnais Lake Area Water Management Organization

Valley Branch Watershed District

The RCD has official and unofficial liaisons with many governmental and non-governmental agencies and organizations. As an agency with countywide jurisdiction, it is in a central position to coordinate and simplify interagency and interjurisdictional solutions to natural resource management problems. A crucial niche for the RCD is to provide soil and water conservation services to private landowners, who make up the majority of land use in Ramsey County.

The Metropolitan Surface Water Management Act of 1982 requires that the seven county metro area form either a watershed district (WD) or joint powers water management organization (WMO). In Ramsey County, the Capitol Region Watershed District is the only WD or WMO to reside wholly within Ramsey County boundaries. In addition, there is: Lower Minnesota River Management Organization, Lower Mississippi River Management Organization, Mississippi Watershed Mangagement Organziation, Ramsey Washington Metro Watershed District, Rice Creek Watershed District, Vadnais Lake Area Water Management Organization, and Valley Branch Watershed District. (See map on page 24.) These eight local government organizations are required to have comprehensive ten-year watershed management plans and are the RCD's priority partners. By state statute, the RCD Board of Supervisors is assigned to serve on the three largest WDs' Citizen Advisory Committees.

WATERSHED DISTRICT/WMO PRESENCE IN RAMSEY COUNTY	% OF RAMSEY AREA	% OF RAMSEY POPULATION
Capitol Region Watershed District	23.8%	42.5%
Lower Minnesota River Watershed District	0.2%	0.0%
Lower Mississippi River Water Management Organization	2.8%	2.7%
Mississippi Watershed Management Organization	0.2%	0.7%
Ramsey-Washington Metro Watershed District	31.6%	30.0%
Rice Creek Watershed District	27.6%	17.4%
Vadnais Lake Area Water Management Organization	13.3%	6.1%
Valley Branch Watershed District	0.5%	0.6%

To better serve the citizens of Ramsey County, the RCD will continue to facilitate relations between Ramsey County and local governmental officials and natural resource protection agencies. Some of the RCD partners and liaisons include:

- Board of Water and Soil Resources
- Cities (19)
- Metropolitan Council
- Minnesota Department of Agriculture (MDA)
- Minnesota Department of Health (MDH)
- Minnesota Department of Natural Resources (MnDNR)
- Minnesota Pollution Control Agency (MPCA)
- Natural Resource Conservation Service
- Non-Profit Groups
- Ramsey County
- Watershed Management Organizations (4)
- Watershed Districts (4)
- U.S. Geological Survey (USGS)
- U.S. Army Corps of Engineers (ACOE)

Communities (at Least Partially) **in Ramsey County**

Arden Hills
Blaine (partial)
Falcon Heights
Gem Lake
Lauderdale
Little Canada
Maplewood
Mounds View
New Brighton
North Oaks
North St. Paul
Roseville
Shoreview
St. Anthony (partial)
St. Paul (county seat)
Spring Lake Park (partial)
Vadnais Heights
White Bear Lake (partial)
White Bear Township

Though the RCD works with many state agencies in efforts to enhance and protect natural resources in Ramsey County, the following two state agencies have a greater role in the work of the RCD.

Board of Water and Soil Resources (BWSR)

BWSR was created in 1987 and provides oversight to Minnesota's SWCDs, county water managers, and water management organizations. Their board includes 20 members, which includes SWCDs, WMOs, counties, as well as state agency and private citizen representation. Board members are appointed by the governor to four year terms. BWSR administers most of the grant funding awarded to the RCD, including the following:

- Buffer Law
- Clean Water Fund Grants (part of the Clean Water Land and Legacy amendment passed in 2008)
- Conservation Delivery
- Cooperative Weed Management Area
- Local Capacity Services
- MN Agricultural Water Quality Certification Program
- State Cost Share
- Wetland Conservation Act

Minnesota Department of Natural Resources (MnDNR)

The MnDNR has issued the RCD a "General Permit" which allows the RCD to approve bio-engineered technical practices for lakeshore owners seeking to buffer their shoreline. Permit requests relating to work within the beds of public waters and wetlands in Ramsey County (below the Ordinary High Water level) are referred to the RCD. In addition, the RCD assists the MnDNR with the following programs:

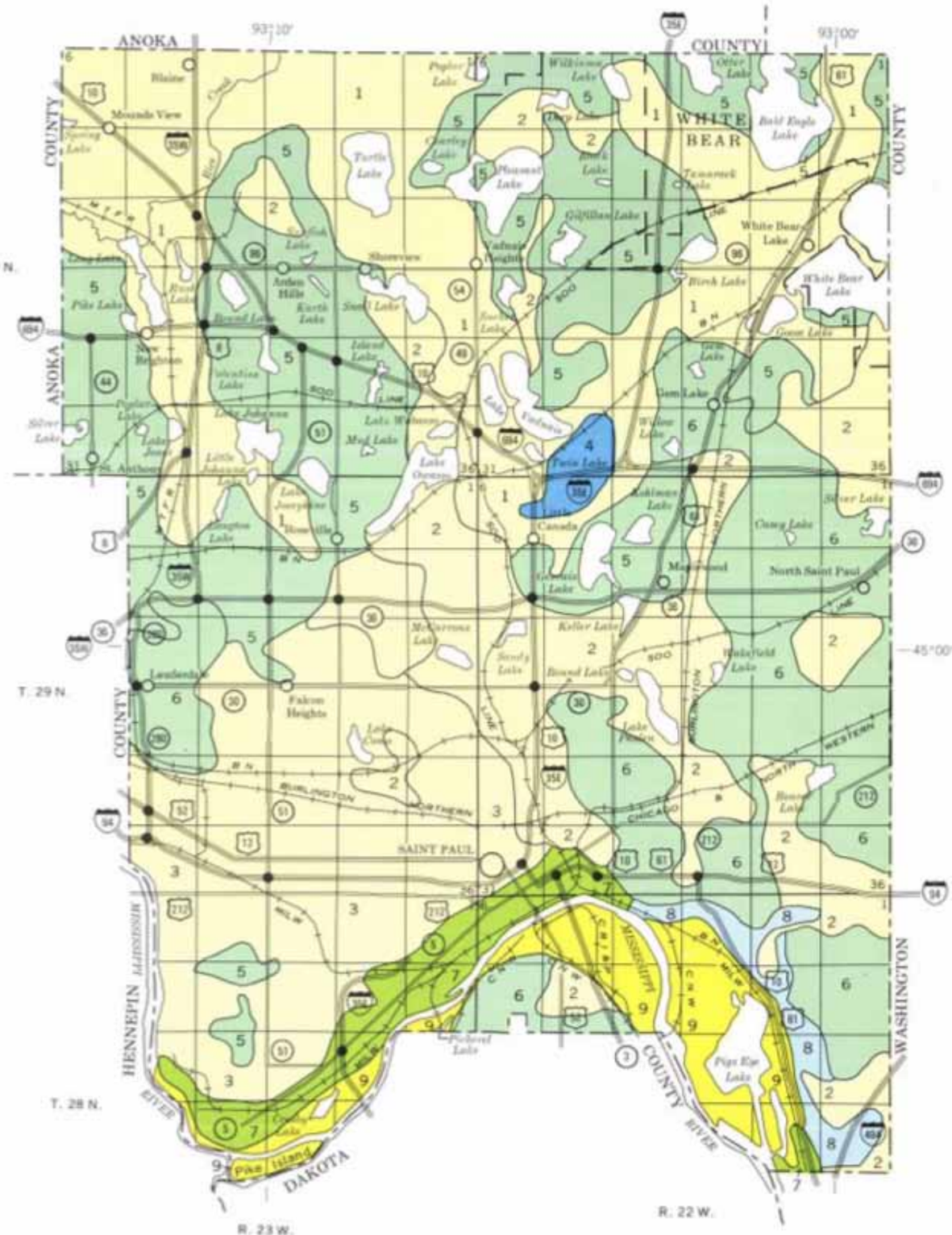
- MnDNR Observation Well Program: 18 wells in Ramsey County are monitored by RCD staff to assess aquifer levels
- Rain Gauge Network: RCD collects precipitation data from over 60 volunteers and reports the data on the MNDNR State Climatology web site at http://climate.umn.edu/
- North & East Groundwater Management Area (GWMA): All of Ramsey and Washington counties are located within the North & East GWMA, along with portions of Anoka and Hennepin counties. The North & East GWMA is one of three GWMAs established in the state to address groundwater sustainability issues and provide solutions to meet the challenges. The RCD will consider the North & East Metro GWMA Plan in groundwater protections efforts

V. SOIL SURVEY

With urbanization, natural soils have been moved, debris has been deposited from the demolition of structures, and soils have become compacted, altering their natural capacity to infiltrate stormwater.

In general, the soils of Ramsey County were deposited by the last glaciers to cover Minnesota approximately 10,000 years ago. The glaciers brought an assortment of geologic materials from regions to the far northwest and northeast. For example, rocks of all shapes and sizes, minerals, and fine materials from the fracturing of large rocks, called sands, silts, and clay, unsorted rocks and fine materials were deposited by several advances and retreats of the glaciers. Depending on location in Ramsey County, soils may be coarse sand mixed with gravel, fine sands with layers of silts and clays, a mixture of sands, silts and clays called loam, or a combination of all. In addition to the geologic material, soils are also influenced by the actions of water, vegetation, and slope. Much of Ramsey County's natural soil has been significantly modified by human actions creating what is known as "urbanized soil classes." With urbanization of the landscape, natural soils have been moved from place to place, debris has been deposited from the demolition of our structures, and soils have become compacted, altering their natural capacity to infiltrate stormwater.

THE GENERAL SOILS MAP OF RAMSEY COUNTY



The light-yellow areas of the map are soils that were formed from glacial outwash materials. Soils are usually sandy to fine sand in texture. These soils typically drain well, especially at the high points of the landscape.

The dark-blue area is dominated by very fine textured soil material. This area was once a large glacial lake. These soils drain very slowly and wetness is a common problem. These soils are very fertile and are used with great success for gardening.

The light-green areas are glacial till that contain a mixture of soil textures in ranging from clay to coarse sands and gravels. When building in these soils, it is important to examine the soils at many locations as soils can vary greatly within short distances.

The lime-green areas are very shallow soils over bedrock. The depth to bedrock may only be inches in some places.

The dark-yellow areas on the map are the most dynamic of all our soils. They continue to form to this day. This area is the Mississippi River flood plain. The soils in this area are altered with every major flood.

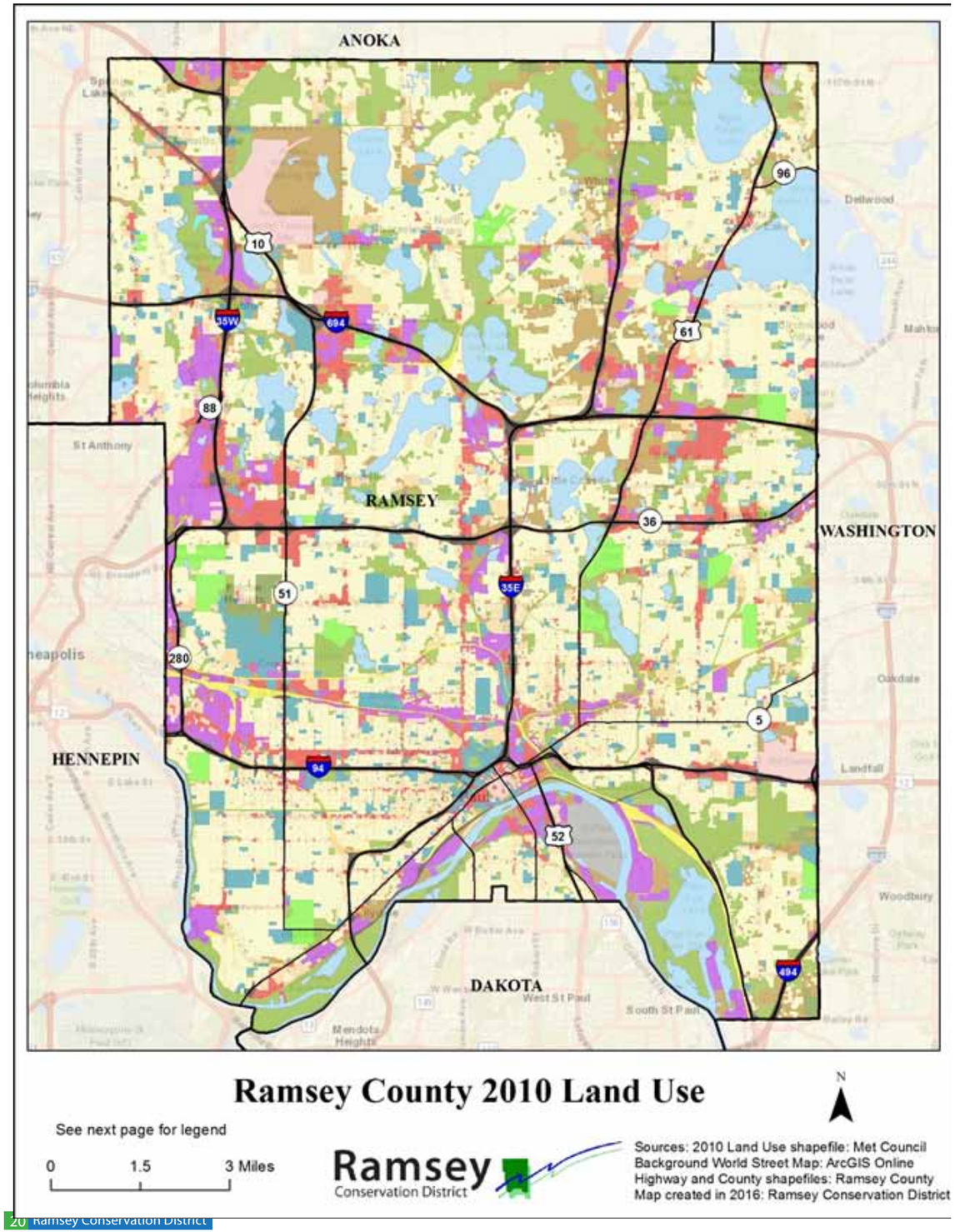
VI. RAMSEY COUNTY LAND USE

The Land Use Map of Ramsey County on page 20 identifies that approximately 10% of the area is open water. The total land area of Ramsey County is 170 square miles, and as of the 2010 census, the population was 508,640. The result is that Ramsey County is the most densely populated county in Minnesota and the most developed. Less than one percent of the land use is agricultural.

The highly urbanized land use patterns include a large acreage of impervious surface areas and highly efficient stormwater conveyance systems (i.e., curb and gutter storm sewer systems). These practices subject water bodies to large amounts of non-point source pollutants.

Ramsey County is the most densely populated county in Minnesota and the most developed.

RAMSEY COUNTY LAND USE AND COVER



Land Use Legend

- Industrial and Utility
- Institutitional
- Major Highway
- Mixed Use
- Multifamily Residential
- Single Family Residential
- Undeveloped
- Open Water
- Park, Rec, or Preserve
- Railway
- Commercial
- Agricultural
- Airport
- Extractive
- Golf Course

Ramsey County Land Use Change 1990 to 2010 (Met Council data)

Land Use Type	Acres		Percent land cover	
	1990	2010	1990	2010
Agricultural	20,746	607	19%	1%
Undeveloped		8,626		8%
Parks, Recreation & Preserves	11,147	16,467	10%	15%
Major Vehicular ROW	3,759	4,065	3%	4%
Mixed Use	-	1,994	0%	2%
Commercial	4,381	5,843	4%	5%
Industrial	7,913	6,549	7%	6%
Multi-Family Residential	3,858	7,278	4%	7%
Single Family Residential	40,693	40,129	37%	37%
Open Water Bodies	9,765	10,262	9%	9%
Airport	647	575	1%	1%
Institutional	6,009	6,305	6%	6%

Note: In 1990, Agricultural & Undeveloped were joined and "Mixed Use" did not exist

Land Use Categories	Land use Sub-Categories, Met Council 2010
Agricultural	Agricultural
Undeveloped	Undeveloped (includes vacant land)
Parks, Recreation & Preserves	Golf Courses, Park, Recreational, or Preserve
Major Roads	Major Highway
Mixed Use	M.U. Residential, M.U. Industrial, M.U. Commercial
Commercial	Retail and Other Commercial, Office
Industrial	Industrial and Utility, Major Railway, Extractive
Multi-Family Residential	Multifamily Residential, Single-Family-Attached
Single Family Residential	Seasonal/Vacation, Manufactured Housing Parks, Single-Family-Detached
Open Water Bodies	Water
Airport	Airport
Institutional	Institutional

VII. RAMSEY COUNTY RESOURCE ASSESSMENT

Minnesota Pollution Control Agency Lake Standards for the North Central Hardwood Forest Region			
	Phosphorus key nutrient causing excess algae	**Chlorophyll-A** used as an indicator of algal biomass	**Secchi Disk Depth** used to measure water clarity
Deep Lakes	40 µg/L	14 µg/L	1.4 meters
Shallow Lakes	60 µg/L	20 µg/L	1.0 meter

LIST OF IMPAIRMENTS AND "TOTAL MAXIMUM DAILY LOADS" (TMDLs)

Ramsey County's natural resources provide the industrial base, living space, drinking water, and recreational opportunities for more than a half million people. Many environmental problems can be traced to the effects of urban land use.

Ramsey County has 120 lakes identified on the DNR's website http://www.dnr.state.mn.us. 33 lakes, five streams, and one wetland are listed on the on the Environmental Protection Agency's Minnesota Impaired Waters List (https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list).

WHAT IS A LAKE "IMPAIRMENT"?

An impaired water describes waters that are too polluted or otherwise degraded to meet water quality standards for their designated use. For example, if a lake is designated as a swimming lake, but the problems with the lake inhibit swimming, the lake is considered impaired. Under section 303(d) of the Clean Water Act, states are required to submit lists of impaired waters to the MPCA. Once a water body is added to the approved impaired waters list, a total maximum daily load (TMDL) must be developed for it.

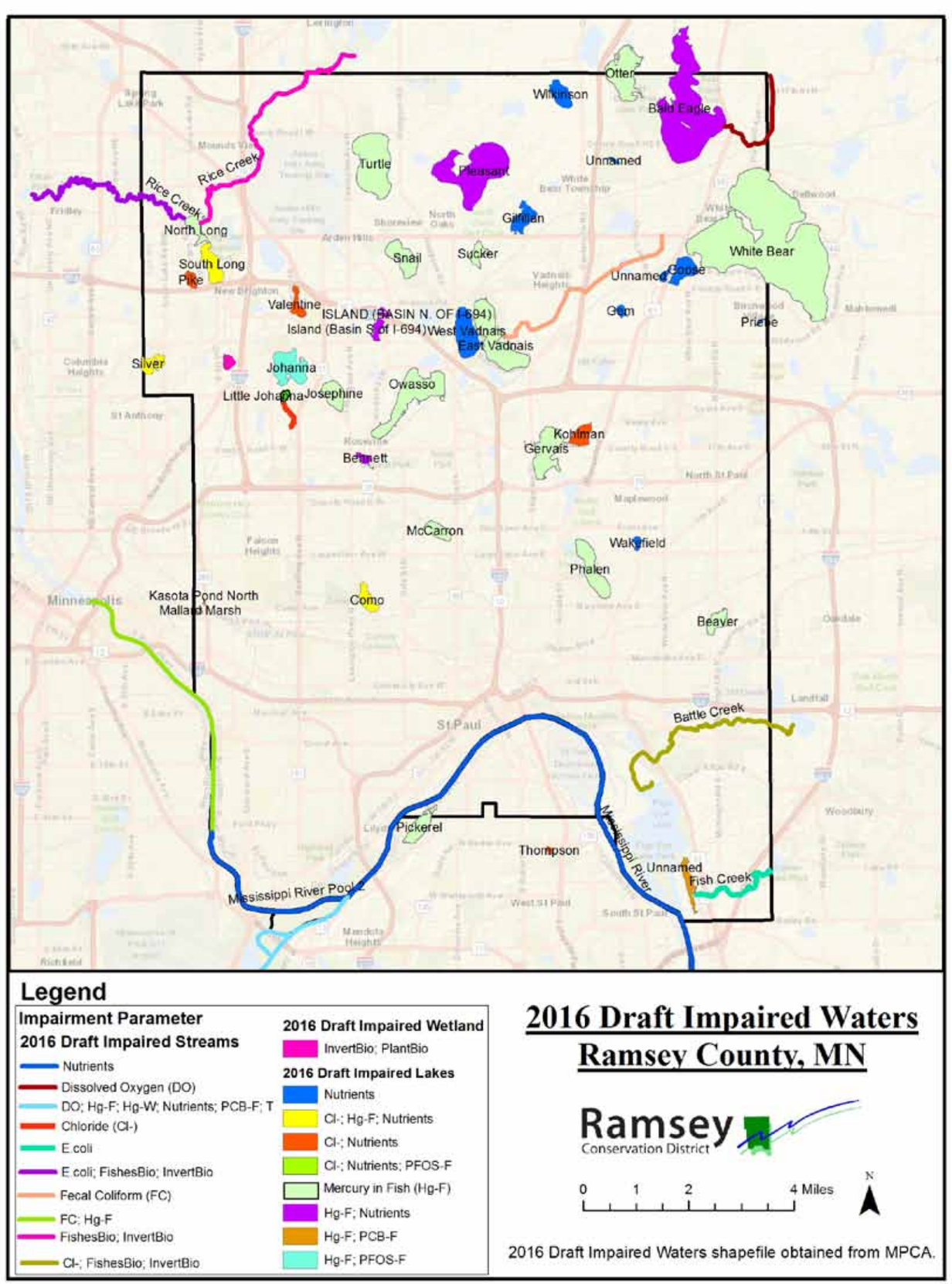
WHAT IS A "TOTAL MAXIMUM DAILY LOAD (TMDL)"?

A TMDL is a pollution budget that includes a calculation of the maximum amount of a pollutant that can occur in a water body while still meeting state water quality standards. It allocates necessary reductions to pollutant sources. A TMDL serves as a planning tool and potential starting point for restoration or protection activities with the ultimate goal of attaining or maintaining water quality standards.

The RCD considers impaired water bodies to be high priority areas of concern. The following section describes some of the approved TMDLs as well as Watershed Restoration and Protection Strategy (WRAPS) within Ramsey County, as organized by watershed district or watershed management organization.

What does "**Excess Nutrients**" mean?

Nutrient pollution is the process where too many nutrients, especially phosphorus, are added to bodies of water and can act like fertilizer, causing excessive growth of algae.



Legend

Impairment Parameter

2016 Draft Impaired Streams
- Nutrients
- Dissolved Oxygen (DO)
- DO; Hg-F; Hg-W; Nutrients; PCB-F; T
- Chloride (Cl-)
- E coli
- E coli; FishesBio; InvertBio
- Fecal Coliform (FC)
- FC; Hg-F
- FishesBio; InvertBio
- Cl-; FishesBio; InvertBio

2016 Draft Impaired Wetland
- InvertBio; PlantBio

2016 Draft Impaired Lakes
- Nutrients
- Cl-; Hg-F; Nutrients
- Cl-; Nutrients
- Cl-; Nutrients; PFOS-F
- Mercury in Fish (Hg-F)
- Hg-F; Nutrients
- Hg-F; PCB-F
- Hg-F; PFOS-F

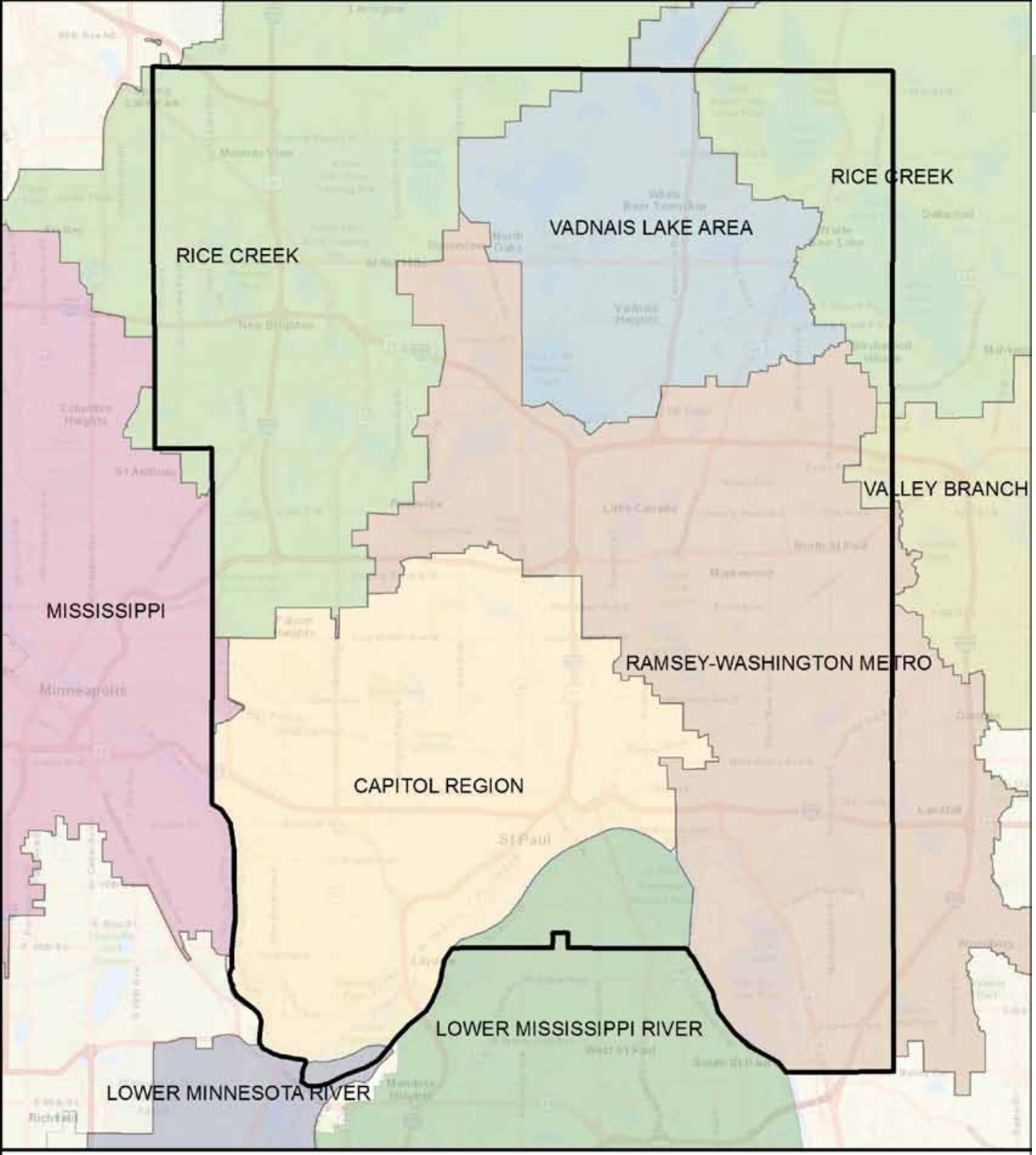
2016 Draft Impaired Waters
Ramsey County, MN

Ramsey Conservation District

0 1 2 4 Miles

N

2016 Draft Impaired Waters shapefile obtained from MPCA.



RICE CREEK WATERSHED DISTRICT (RCWD)

BALD EAGLE LAKE TMDL (APPROVED)
This TMDL plan addresses Bald Eagle Lake, which is impaired due to excess nutrients. Bald Eagle Lake is located primarily in White Bear Township in Ramsey County, but also extends into the City of Hugo in Washington County and the City of Lino Lakes in Anoka County in the Upper Mississippi River watershed. It is a highly used recreational water body with an active fishery.

The drainage area to the lake is 10,835 acres that is predominantly single family residential and undeveloped land with a large proportion of wetlands. The drainage area contains portions of White Bear Township, but also includes portions of the cities of Hugo, Grant, Dellwood, White Bear Lake, and Lino Lakes. The outlet for Bald Eagle Lake is a channel at the north end of the lake where it flows into Clearwater Creek.

Water quality is considered moderately degraded, with the lake still viewed as a popular resource for recreational activities. The TMDL goal for Bald Eagle Lake is 5.2 pounds/day phosphorus, and the numeric target concentraion standard for the lake is 40 µg/L or less. Waste load and Load Allocations to meet state standards indicate that average nutrient load reductions of 58% would be required to consistently meet standards. Internal load management (91% reduction) and reduction of phosphorus from watershed runoff (38% reduction) will be required for Bald Eagle Lake to meet state standards.

SILVER LAKE TMDL (APPROVED)
Silver Lake is a 72.5-acre basin located partially in the city of Columbia Heights and partially in the city of St. Anthony Village, and the watershed is located within four municipalities and three counties (Anoka, Hennepin and Ramsey). Silver Lake has a 678.6-acre watershed. Hart Lake drains to Silver Lake from the southwest and a series of natural wetlands are found northeast of the lake within Silverwood Park, previously a Salvation Army camp, but now owned by the Three Rivers Park District. Silver Lake outlets to Ramsey County Ditch (RCD) 3 which outlets into RCD 2 and eventually to Rice Creek and the Mississippi River. The main land uses in the Silver Lake watershed are single family residential (40%), institutional (13%), multi-family (12%), and commercial (11%).

The goal of this TMDL is to quantify the pollutant reductions needed for Silver Lake to meet state water quality standards. The numeric targets for shallow lakes in the North Central Hardwood Forest Ecoregion are summer averages of <60 µg/L total phosphorus concentration, <20 µg/L chlorophyll-a concentration, and >1.0 meter of Secchi depth. The summer average total phosphorus concentration in Silver Lake ranges from approximately 40 µg/L to 110 µg/L for the years in which measurements were taken. Chlorophyll-a ranged from approximately 18 µg/L to 52 µg/L. Water clarity, as measured by Secchi depth measurements ranged from approximately 0.55 meters to over 1.2 meters. A reduction of 15% in phosphorus loading to Silver Lake would be required to consistently meet water quality standards under average precipitation conditions. In-lake phosphorus load management and the reduction of phosphorus from urban runoff in the watershed by retrofitting Best Management Practices (BMP) would have the most impact on reducing phosphorus loads and improving water quality in Silver Lake.

RCWD SOUTHWEST URBAN LAKES TMDL (APPROVED)
This TMDL plan addresses excess nutrients in Island Lake, North Basin (62-0075-02), Island Lake, South Basin (62-0075-01), Little Lake Johanna (62-0058-00), Long Lake, South Basin (62-0067-00), Moore Lake, East (02-0075-01), Pike Lake (62-0069-00), and Lake Valentine (62-0071-00). These water bodies and the land area that drains to them are located in the southwest portion of the Rice Creek watershed in Ramsey County and Anoka County.

Rice Creek Watershed District (RCWD)	
Bald Eagle Lake TMDL	Excess Nutrients
Silver Lake TMDL	Excess Nutrients
Southwest Urban Lakes TMDL	Excess Nutrients
Island Lake (North and South Basins)	Excess Nutrients
Little Lake Johanna	Excess Nutrients
Long Lake	Excess Nutrients
Moore Lake	Excess Nutrients
Pike Lake	Excess Nutrients
Lake Valentine	Excess Nutrients

VADNAIS LAKE AREA WATERSHED MANAGEMENT ORGANIZATION (VLAWMO)

VADNAIS LAKE AREA WMO TMDL AND PROTECTION STUDY:

This report sets TMDLs for six water bodies included on the MPCA's 303(d) list of impaired waters in 2008 (Lambert Creek) and 2010 (Gem, East Goose, West Goose, Gilfillan, and Wilkinson Lakes). These lakes and streams are within the Upper Mississippi River Basin within the jurisdiction of VLAWMO, which covers approximately 25 square miles in the northeast Twin Cities Metropolitan Area.

Vadnais Lake Area Watershed Management Organization (VLAWMO)	
Lambert Creek	Bacteria
Gem Lake	Excess Nutrients
Goose Lake (East and West)	Excess Nutrients
Gilfillan Lake	Excess Nutrients
Wilkinson Lake	Excess Nutrients

East and West Goose Lake, Gem Lake, Gilfillan Lake and Wilkinson Lake do not currently meet the Minnesota lake water quality standards for shallow lakes in the North Central Hardwood Forest ecoregion. Water quality in these lakes has remained consistently above the state standard for phosphorus. Land uses in the tributary watersheds to the impaired lakes are a mix of agriculture, developed area, and undeveloped areas. The Gilfillan Lake and East Goose Lake subwatersheds are nearly totally developed, while the Wilkinson Lake and West Goose Lake watersheds contain significant areas of parkland and undeveloped area. The Gem Lake watershed is 45% undeveloped. Lambert Creek does not currently meet Minnesota standards for bacteria as evaluated by the use of *E. coli* measurements. The Lambert Creek watershed is a mix of developed, undeveloped, park and recreation, and agriculture land use. Water quality data and lake response models show that the required total phosphorus load reductions to meet state standards in the lakes are: 24% reduction in Gem Lake which will come primarily from watershed sources, 91% reduction in East Goose Lake which will come primarily from internal sources with some watershed load reduction, 70% reduction in West Goose Lake which will come from internal, watershed, and E. Goose Lake loading, 62% reduction in Gilfillan Lake which will come primarily from internal loading, and 63% reduction in Wilkinson Lake which will come from watershed sources.

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT (RWMWD)

KOHLMAN LAKES TMDL

The Kohlman Lakes watershed is 7,484 acres and drains portions of the cities of Gem Lake, White Bear Lake, Vadnais Heights, Maplewood, North St. Paul, Little Canada, and Oakdale. The 74-acre lake has an average depth of four feet. Shallow lakes are more susceptible to excessive phosphorus pollution, which can degrade lake water quality and contribute to summer algae blooms.

The mean surface water concentrations of phosphorus in Kohlman Lake have ranged from 66 µg/L (in 2002) to 171 µg/L since 1982, giving the lake a hypereutrophic classification. The mean growing season phosphorus concentration from 1997 to 2006 was 98 µg/L. The external phosphorus load to Kohlman Lake, based on an average precipitation model and summed over the growing season (June through September) was 943 pounds. The sediment analysis and macrophyte survey determined that the internal phosphorus load over the growing season is 872 pounds.

The water quality goal will be set at 60 micrograms per liter (µg/l) for the mean total phosphorus concentration during the growing season (June 1–September 30). Because the assimilative capacity of a waterbody varies with the water load and precipitation, the TMDL was set for dry, average and wet years.

Ramsey Washington Metro Watershed District (RWMWD)	
Kohlman Lakes TMDL	Excess Nutrients
Bennett Lake DRAFT TMDL	Excess Nutrients
Wakefield Lake DRAFT TMDL	Excess Nutrients
Fish Creek	Bacteria: *E. coli*
Long Lake DRAFT TMDL	Bacteria: *E. coli*
Battle Creek DRAFT TMDL	Biotic: Macroinvertebrate , Fish Communities

CAPITOL REGION WATERSHED DISTRICT (CRWD)

COMO LAKE TMDL (APPROVED):

The Como Lake watershed is located in the north-central portion of the Capitol Region Watershed District and is within the Upper Mississippi Watershed. Como Lake is located in Saint Paul, and the watershed is located within three municipalities in Ramsey County. Como Lake is a shallow lake with a 1783-acre watershed. The majority of the watershed's water contribution to Como Lake is delivered through an extensive piped stormwater system consisting of 22 storm sewers discharging directly into the lake. Como Lake discharges into the Trout Brook storm sewer and ultimately discharges to the Mississippi River.

Total phosphorus concentration growing season means ranged from 100 to 400 µg/L in the years 1993 to 2007, exceeding the ecoregion standard for shallow lakes each year. Chlorophyll-a concentration growing season means ranged from to 10 µg/L to 60 µg/L in 1993 to 2007, only meeting the ecoregion shallow lakes standard in 1998, 1999, and 2004. The three categories of phosphorus loads to Como Lake are watershed runoff (34%), internal loading (65%), and atmospheric deposition (1%).

A 60% reduction in watershed load and a 97% reduction in internal load are required in the TMDL to meet water quality standards under average precipitation conditions. In-lake phosphorus load management and the reduction of phosphorus from urban runoff in the watershed by retrofitting Best Management Practices (BMPs) would have the most impact on reducing phosphorus loads and improving water quality in Como Lake.

Capitol Region Watershed District (CRWD)	
Como Lake TMDL	Excess Nutrients

VALLEY BRANCH WATERSHED DISTRICT (VBWD)

VBWD WRAPS/TMDL PROJECT (APPROVED):

The Valley Branch Watershed District (VBWD) is located in the St. Croix River Basin. The watershed encompasses approximately 44,800 acres and includes 47 public lakes and wetlands (greater than 10 acres), and three streams. Main land uses include agriculture, forested, and developed land. This Watershed Restoration and Protection Strategy (WRAPS) project is a joint effort between the VBWD, Ramsey County Public Works, RCD, WCD, local communities, MnDNR, MPCA, and other state, local, and federal agencies. Protection strategies were developed for Silver Lake, Lake Edith, Horseshoe Lake and Eagle Point Lake.

Valley Branch Watershed District (VBWD)	
Silver Lake	Excess Nutrients

Silver Lake is located in Ramsey County, and was the only lake that had a statistically significant degrading trend in water quality from 2004-2013. Silver Lake's 2013 summer average Secchi disc transparency of 0.94 meters (3.08 feet) is the poorest summer -average since 1977. The historic water quality data show a rapid decrease in water quality beginning in 2007. The degrading water quality conditions observed during the recent period from 2007-2013 are most likely due to the whole-lake aquatic plant treatment applied to the lake in 2007 and 2008 to manage Eurasian watermilfoil and curly-leaf pondweed. One hypothesis is that the application of the herbicides was too late in the spring when the native plant communities were beginning to grow. The herbicides killed many of the native plants, and this change caused the poorer water quality. In addition to poorer Secchi disc transparency, the 2013 summer average TP concentration for Silver Lake was 114 µg/L, which is poorer than the VBWD goal of 40 µg/L and the MPCA TP criterion for shallow lakes of 60 µg/L or less. Additionally, Silver Lake's summer average for chlorophyll-a was 42 µg/L, which is above the impaired waters listing criterion.

LOWER MISSISSIPPI RIVER WATERSHED MANAGEMENT ORGANIZATION

LOWER MISSISSIPPI RIVER WMO WRAPS/TMDL PROJECT (APPROVED):

The watershed encompasses approximately 35,493 acres and includes 88 lakes and wetlands, 4 streams, and the Mississippi River. The LMRWMO Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategy (WRAPS) Report is a project that is addressing the water quality and pollution sources of five lakes in the watershed.

Pickerel Lake is located in Lilydale and the City of West St Paul, within Ramsey County. The sub-watershed area is 1,320 acres and the lake surface area is 115 acres. It has poor water quality due to excessive nutrients [phosphorous] that spur algae growth. Pickerel Lake has a maximum depth of 11 feet and therefore must meet Minnesota water quality standards for shallow lakes (see table below). Pickerel Lake was monitored in 2010, 2011 and 2012. In 2010, total phosphorus and chlorophyll -a concentrations did not meet state standards and in 2011, none of the parameters met state standards.

Lower Mississippi River Watershed Management Organization (LMRWMO)	
Pickerel Lake	Excess Nutrients

LOWER MINNESOTA RIVER WATERSHED MANAGEMENT ORGANIZATION

LOWER MINNESOTA RIVER WMO WRAPS/TMDL PROJECT (APPROVED):

The lower 22 miles of the Minnesota River do meet the dissolved oxygen standard during low flow conditions due to high levels of biochemical oxygen demand. The TMDL Report identified four sectors that impact phosphorus concentrations in the river: 1) wastewater treatment facilities (1,800 pounds of phosphorus/year) 2) urban stormwater runoff 3) direct discharges of sewage from residences or unsewered communities; and 4) runoff from agricultural cropland. Results of the TMDL study indicated that wastewater treatment facilities, urban stormwater, and direct discharges of sewage would be effective in reducing phosphorus. Agriculture, however, was not as effective in decreasing phosphorus due to the lack of runoff during low flow conditions.

Lower Minnesota River Watershed Management Organization	
Lower 22 miles of Minnesota River	Dissolved oxygen

COUNTY-WIDE TMDLS

TWIN CITIES METRO AREA CHLORIDE TMDL (APPROVED)

The Minnesota Pollution Control Agency (MPCA) partnered with local and state experts in the Seven County Twin Cities Metropolitan Area (TCMA) and to study how to effectively manage salt use to protect our water resources. This Twin Cities Metropolitan Area Chloride Total Maximum Daily Load Study, released in February 2016, aims to:

1. Determine the allowable chloride loading to impaired lakes, wetlands and streams in the TCMA;
2. Allocate the allowable loading to the various sources of chloride and establish reasonable and practical expectations for meeting reduction goals; and
3. Provide stakeholders and chloride users with guidance and tools to improve practices, reduce chloride use, and ultimately attain chloride criteria in all waterbodies in the TCMA.

There are currently 39 waterbodies that tested above the water quality standard for chloride in the TCMA. An additional 38 surface waters are near the chloride standard and many others are unknown. The data show that salt concentrations are continuing to increase in both surface waters and groundwater across the state.

SOUTH METRO MISSISSIPPI RIVER – TURBIDITY: TMDL PROJECT (APPROVED)

The South Metro Mississippi River Total Suspended Solids (TSS) TMDL is a companion project to the Lake Pepin eutrophication TMDL. A river model extends from Lock and Dam 1 to Lock and Dam 4. The present TMDL applies to the TSS-impaired reach extending from River Mile 844 at the confluence with the Minnesota River to River Mile 780 in upper Lake Pepin. The TMDL addresses water quality impairment in this impaired reach, and also the accelerated in-filling of Lake Pepin with sediment. The watershed to the South Metro Mississippi encompasses half of the state of Minnesota and part of northwest and west-central Wisconsin. Within Minnesota, it includes 33 major watersheds contributing suspended solids to the Mississippi. The MPCA and local partners are conducting turbidity TMDLs upstream on the Minnesota River and its tributaries which contribute an average 74% of the TSS load to the South Metro Mississippi. The main finding of the Mississippi TSS TMDL study is that TSS loads from the Minnesota River Basin and other heavy-loading watersheds will need to decrease by 50% to 60% to meet the site-specific standard for turbidity in the South Metro Mississippi River. Loads from other tributaries will need to decrease by up to 20%. The steepest reductions are focused on watersheds where 80% of the sediment originates. These reductions will need to occur in years of medium and higher flows with sufficient frequency to meet a summer mean of 32 mg/L TSS in at least five summers over a 10-year period. If these conditions are met, the river should respond with a flourish of growth in submersed aquatic vegetation and a significant improvement in general ecosystem health. As an additional benefit, the TSS load reductions would reduce the rate of sediment in-filling of Lake Pepin by about one-half.

STATEWIDE TMDL: MERCURY POLLUTANT REDUCTION PLAN (APPROVED)

The U.S. EPA approved Minnesota's Statewide Mercury TMDL study in March 2007. Since then, the MPCA has worked with stakeholders to identify strategies and timelines that would be included in an implementation plan.

Total mercury deposition in 1990 was 12.5 g km^{-2} yr^{-1} throughout the state. To achieve the target levels in fish tissue, the mercury deposition goals are 4.4 g km^{-2} yr^{-1} for the NE and 6.1 g km^{-2} yr^{-1} for the SW. Mercury load reduction goals for each regional TMDL were calculated by applying the reduction factor to the baseline mercury load. Reductions can only come from anthropogenic sources. Therefore, load reduction goals require anthropogenic source reductions of 93% (65% reduction goal divided by 70% of total that is anthropogenic) in the NE region and 73% (51% of reduction goal divided by 70% anthropogenic) in the SW region. 10% of the mercury deposition is attributed to anthropogenic sources within the state. The state's percentage of the anthropogenic sources is 14.3% (10% of total divided by 70% of total). The state's contributions to the load allocations (LA) are 0.16 kg/d for the NE and 0.31 kg/d for the SW. The out-of-state contributions to the LA are 0.94 kg/d for the NE and 1.86 kg/d for the SW.

OVERVIEW OF RAMSEY COUNTY LAKES

Lake/ Water Mgmt. Org.	Lake Size (acres)	Maximum Lake Depth (feet)	Impairment	TMDL Year	MPCA Classification
Bald Eagle/ RCWD	1011	37	HgF, Nutrients	2008, 2012	Deep
Beaver/RWMWD	78	11	HgF	2008, 2016	Shallow
Bennett/ RWMWD	25.6	9	HgF, Nutrients	N/A	Shallow
Birch/VLAWMO	123	N/A	N/A	N/A	Shallow
Black/VLAWMO	9.9	N/A	N/A	N/A	Shallow
Casey/RWMWD	13.4	3.5	N/A	N/A	N/A
Charley/ VLAWMO	30.9	20	N/A	N/A	Shallow
Como/CRWD	67.6	15.5	HgF, Nutrients, Chloride	2008, 2010	Shallow
Crosby/CRWD	54.8	17	N/A	N/A	Shallow
Deep/VLAWMO	68.2	11	N/A	N/A	Shallow
East Vadnais/ VLAWMO	379.3	58	HgF	2008	Deep
Gem/VLAWMO	20.6	N/A	Nutrients	2010	Shallow
Gervais/ RWMWD	228.7	48	HgF	2008	Deep
Gilfillan/ VLAWMO	101	9	Nutrients	2010	Shallow
Goose East/ VLAWMO	110.2	6	Nutrients	2010	Shallow
Goose West/ VLAWMO	20.2	6	Nutrients	2010	Shallow
Island North/ RCWD	17.6	11	HgF, Nutrients	2014	Shallow
Island South/ RCWD	39.8	11	HgF, Nutrients	2014	Shallow
Johanna/RCWD	206.2	43	HgF, PFOS-F	2008	Deep

Invasive Species	Trophic Status	2016 Grade	Location	ID	OHW	County Boat Launch Spaces
Eurasian watermilfoil, Flowering rush	Eutrophic	A	White Bear Lake	62000200	911.87	46
Eurasian watermilfoil	Eutrophic	B	Maplewood/STP	62001600	950.8	None
N/A	Eutrophic	C	Roseville	62004800	887.6	None
Eurasian watermilfoil	Mesotrophic	N/A	White Bear Lake	62002400	920.53	None
N/A	Mesotrophic	N/A	North Oaks	62001900	899.4	None
N/A	Hypereutrophic	N/A	North St. Paul	62000500	926.3	None
zebra mussel	Eutrophic	N/A	North Oaks	62006200	894.8	None
N/A	Hypereutrophic	D	St. Paul	62005500	881.4	None
N/A	Eutrophic	C	Mendota/STP	62004700	N/A	None
N/A	Eutrophic	N/A	North Oaks	62001800	N/A	None
zebra mussel, Eurasian watermilfoil	Mesotrophic	N/A	Vadnais Heights	62003801	N/A	None
N/A	Eutrophic	N/A	Gem Lake	62003700	946.8	None
Eurasian watermilfoil	Mesotrophic	B	Little Canada	62000700	859.64	None
N/A	Eutrophic	N/A	North Oaks	62002700	N/A	None
N/A	Hypereutrophic	N/A	White Bear Lake	62003400	925.3	None
N/A	Hypereutrophic	N/A	White Bear Lake	62012600	925.3	None
Eurasian watermilfoil	Eutrophic	C	Shoreview	62007502	946.76	None
Eurasian watermilfoil	Eutrophic	B	Shoreview	62007501	946.76	4
Eurasian watermilfoil	Eutrophic	B	Arden Hills	62007800	878	7

Lake/ Water Mgmt. Org.	Lake Size (acres)	Maximum Lake Depth (feet)	Impairment	TMDL Year	MPCA Classification
Josephine/ RCWD	111.3	44	HgF	2008	Deep
Judy/RWMWD	16.3	N/A	N/A	N/A	N/A
Karth/RCWD	18.5	N/A	N/A	N/A	Shallow
Keller/RWMWD	68.2	8	N/A	2010	Shallow
Kohlman/ RWMWD	78.9	9	Nutrients, Chloride	2010	Shallow
Langton/RCWD	N/A	N/A	N/A	N/A	N/A
Little Crosby/ CRWD	N/A	N/A	N/A	N/A	N/A
Little Johanna/ RCWD	17	38	Nutrients, Chloride	2014	Deep
Loeb/CRWD	6.5	28	N/A	N/A	Deep
Long/RCWD	N/A	N/A	N/A	N/A	N/A
Long/RCWD	186.6	24	HgF, Nutrients, Chloride	2008, 2014	Deep
Marsden/RCWD	107.2	N/A	N/A	N/A	N/A
McCarron/CRWD	72.9	57	HgF	2008	Deep
Otter/RCWD	279.8	21	HgF	2008	Shallow
Owasso/ RWMWD	366.6	37	HgF	2008	Deep
Phalen/RWMWD	191.5	91	HgF	N/A	Deep
Pickerel/ LMRWMO	107.6	11	HgF	2008	Shallow
Pigs Eye/ RWMWD	815.8	4	N/A	N/A	N/A
Pike/RCWD	35.7	16	Nutrients, Chloride	2014	Shallow
Pleasant/ VLAWMO	586.8	58	HgF, Nutrients	2008	Deep

Invasive Species	Trophic Status	2016 Grade	Location	ID	OHW	County Boat Launch Spaces
Eurasian watermilfoil	Eutrophic	B	Roseville	62005700	884.4	6
N/A	Hypereutrophic	N/A	Arden Hills	62008100	943.9	None
N/A	Eutrophic	N/A	Arden Hills	62007200	934.95	None
Eurasian watermilfoil	Eutrophic	N/A	Maplewood	62001002	N/A	8
Eurasian watermilfoil	Eutrophic	B	Little Canada	62000600	859.5	None
Eurasian watermilfoil	N/A	N/A	Roseville	62004900	906.6	None
N/A	N/A	B	Mendota/STP	N/A	N/A	None
N/A	Eutrophic	N/A	Arden Hills	62005800	N/A	None
Eurasian watermilfoil	Mesotrophic	A	St. Paul	62023100	N/A	None
N/A	N/A	B	N/A	62004500	895.4	None
Eurasian watermilfoil	Eutrophic	D	New Brighton	62006700	864.93	17
N/A	N/A	N/A	Shoreview	62005900	N/A	None
Eurasian watermilfoil	Mesotrophic	A	Roseville	62005400	842.21	6
Eurasian watermilfoil	Mesotrophic	A	White Bear Lake	2000300	912.2	12
Eurasian watermilfoil	Eutrophic	B	Shoreview	62005600	887.1	6
Eurasian watermilfoil	Mesotrophic	A	St. Paul	62001300	N/A	9
N/A	Eutrophic	N/A	Lilydale	19007900	N/A	None
N/A	Hypereutrophic	N/A	St. Paul	62000400	N/A	N/A
N/A	Hypereutrophic	N/A	New Brighton	62006900	867.77	None
Eurasian watermilfoil, zebra mussel	Eutrophic	N/A	North Oaks	62004600	893.5	None

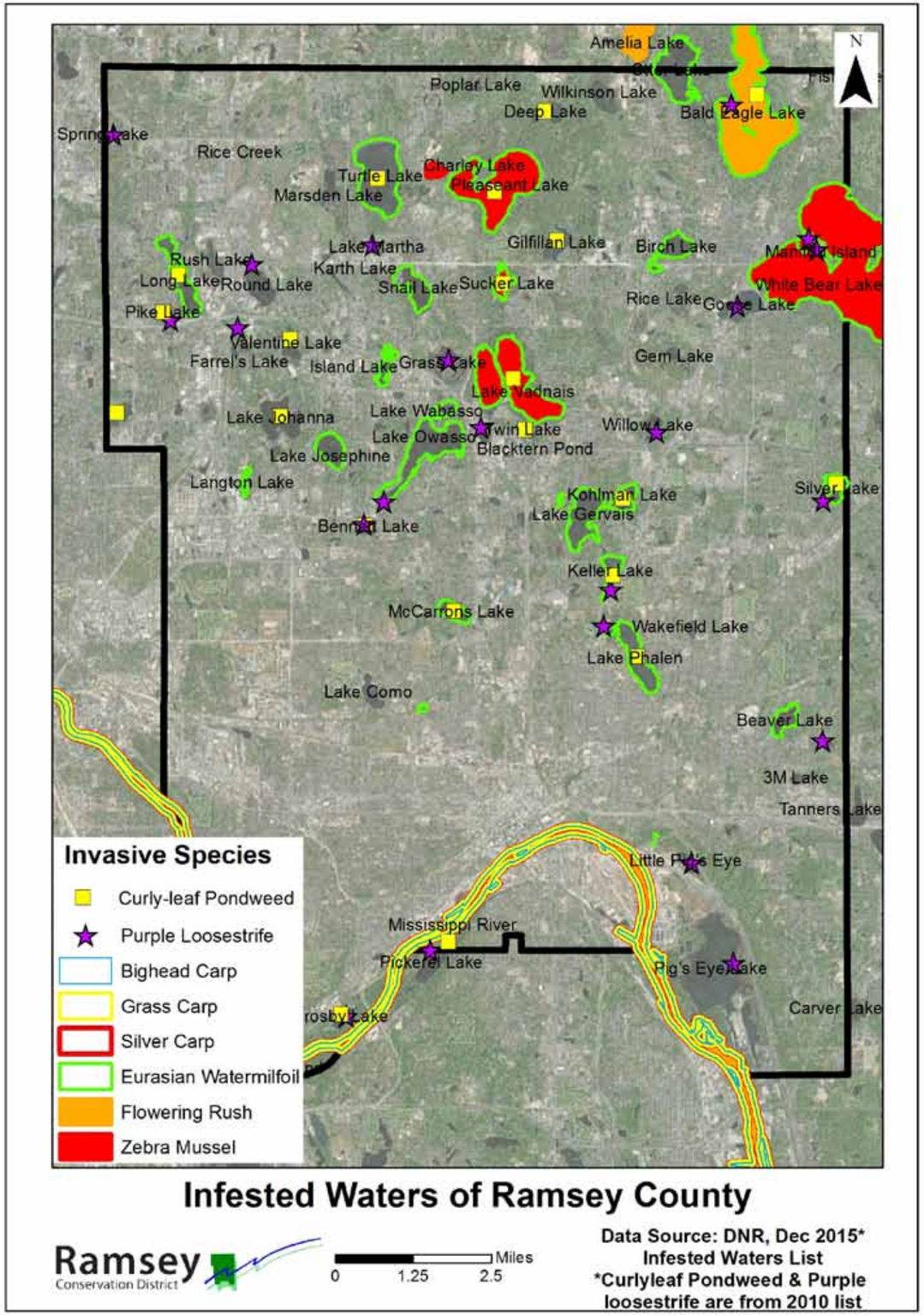
Lake/ Water Mgmt. Org.	Lake Size (acres)	Maximum Lake Depth (feet)	Impairment	TMDL Year	MPCA Classification
Round/RWMWD	18.3	17	N/A	N/A	Shallow
Rush/RCWD	37.3	N/A	N/A	N/A	Shallow
Silver East/ RCWD	70	18	N/A	N/A	Shallow
Silver West/ RCWD	71.55	47	HgF, Nutrients, Chloride	2010	Deep
Snail/RWMWD	147	30	HgF	2008	Deep
Sucker/ VLAWMO	59.5	24	HgF	2008	Deep
Turtle/RCWD	439.3	28	HgF	N/A	Deep
Twin/RWMWD	33.8	33	N/A	N/A	Deep
Valentine/RCWD	54.6	13	Nutrients, Chloride	2014	Shallow
Wabasso/ RWMWD	43	73	N/A	N/A	N/A
Wakefield/ RWMWD	21	N/A	Nutrients	2010	Shallow
West Vadnais/ VLAWMO	207.7	58	Nutrients	N/A	Shallow
White Bear/ RCWD	2408.7	83	HgF	2008	Deep
Wilkinson/ VLAWMO	95.3	1	Nutrients	`N/A	Shallow
Willow/RWMWD	29.7	8	N/A	N/A	N/A

Invasive Species	Trophic Status	2016 Grade	Location	ID	OHW	County Boat Launch Spaces
Eurasian watermilfoil	Eutrophic	A	Maplewood	62001200	N/A	None
N/A	Hypereutrophic	N/A	New Brighton	62006800	870.4	None
Eurasian watermilfoil	Eutrophic	C	N. St. Paul	62000100	989.57	5
N/A	Eutrophic	C	New Brighton	62008300	N/A	5
Eurasian watermilfoil	Mesotrophic	A	Shoreview	62007300	883.7	8
Eurasian watermilfoil, zebra mussel	Mesotrophic	N/A	Vadnais Heights	62002800	884.2	None
Eurasian watermilfoil	Mesotrophic	A	Shoreview	62006100	892.4	20
N/A	Mesotrophic	B	Little Canada	62003900	N/A	None
N/A	Eutrophic	D	Arden Hills	62007100	878.7	None
Eurasian watermilfoil	Mesotrophic	N/A	Shoreview	62008200	886.34	6
N/A	Eutrophic	C	Maplewood	62001100	N/A	None
zebra mussel, Eurasian watermilfoil	Hypereutrophic	N/A	Vadnais Heights	62003802	882.5	None
zebra mussel, Eurasian watermilfoil	Mesotrophic	A	White Bear Lake	82016700	924.89	55
N/A	Eutrophic	N/A	North Oaks	62004300	895.2	None
N/A	Eutrophic	N/A	Vadnais Heights	62004000	N/A	None

MPCA CLASSIFICATION

For the shallow lake classification, the maximum depth is less than 15 feet or more than 80% littoral.

Infested Waters of Ramsey County



Curly-leaf Pondweed

Silver Carp

Purple Loosestrife

Eurasian Watermilfoil

Bighead Carp

Flowering Rush

Grass Carp

Zebra Mussel

IMPAIRED STREAMS

BATTLE CREEK

Battle Creek was placed on Minnesota's 303(d) list of impaired waters in 2014 due to stressors impacting the aquatic macroinvertebrate and fish communities. The Ramsey-Washington Metro Watershed District Watershed Restoration and Protection Strategy (WRAPS) project for this watershed is currently under development. The final project will provide a watershed-wide, multi-parameter TMDL and WRAPS to address all water quality impairments in RWMWD. Protection strategies will be developed for Lake Emily (Washington County), Lake Owasso, Lake Wabasso, Battle Creek (Washington and Ramsey County), Beaver Lake, Keller Lake, and Carver Lake (Washington County).

LAMBERT CREEK

The Lambert Creek project is proposed to improve the water quality because the streambank restoration and buffer will reduce the nutrients running off to the creek. In the 2014 Lambert Creek Bacterial Source Identification Study Final Report, human and avian fecal coliform strains were tested from 2008 to 2014. This study was used to determine if human fecal coliform or avian coliform were causing an impairment in the stream. No human fecal coliform was found in this study, but all 2014 samples tested positive for avian fecal matter. The data between 2012 and 2014 shows a decrease in fecal coliform levels from 2012 to 2014 downstream of a shoreline restoration project implemented in 2013. These buffers deter waterfowl from directly accessing the creek therefore reducing *E. coli* and the bacterial loading. Future shoreline restorations are in the development phase at the time of this plan.

MISSISSIPPI RIVER

The Mississippi River reaches have been analyzed for mercury, bacteria impairments, total suspended solids, and eutrophication in the Minnesota Statewide Mercury Total Maximum Daily Load, Upper Mississippi River Bacteria TMDL Study & Protection Plan, and South Metro Mississippi River Total Suspended Solids Total Maximum Daily Load.

Mercury

Mercury loading in water bodies is 99% sourced from atmospheric deposition according to the state wide TMDL.

Bacteria

The Upper Mississippi River Bacteria TMDL Study and Protection Plan details that the river fails to meet water quality standards for *E. coli.* Concentrations of *E. coli* peak in the Mississippi River near the Twin Cities Metro Area. Potential sources of *E. coli* in the Mississippi River-Twin Cities watershed are humans, pets, livestock, and wildlife. The Upper Mississippi River Bacteria TMDL Implementation Plan outlines strategies for reducing bacteria: identify sources, ensure laws and ordinances are up-to-date and enforced, educating the public about steps to take, and limiting the introduction of bacteria with BMPs as well as reducing bacteria loading with BMPs.

The majority of Ramsey County dwellings are connected to wastewater treatment facilities, which are highly regulated by the MPCA and are unlikely to contribute to loads that exceed the state standard. Combined sewer overflows allow sewage and stormwater to combine in heavy rain events when wastewater and stormwater exceed the capacity of the sewer system. From 2007-2012 there were only two overflow events in the Twin Cities. Ramsey County only has one of these systems left in St. Paul. Sanitary sewer overflows are another nexus for *E. coli* to enter waterbodies. (Note: Appoximately 72% of sanitary sewers in Minneapolis are over 50 years old, which increases the risk of leakages in Hennepin County.) This study estimates that Ramsey County had a 0% imminent threat to public health septic systems.

Total Suspended Solids (TSS)

The South Metro Mississippi River Total Suspended Solids Total Maximum Daily Load study modeled TSS and eutrophication impairments from Lock and Dam 1 to Lock and Dam 4. The South Metro Mississippi watershed incudes 33 major watersheds in Minnesota as well as watersheds in northwest and west central Wisconsin. The Minnesota River contributes 75% of the TSS into the South Metro section of the Mississippi River.

The United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are nested within each

other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system. Ramsey County is considered a part of the Metroshed in the South Metro Mississippi River TSS TMDL study. The Metroshed is not a recognized 8 digit HUC. In this TMDL dividing the watershed this way provided a better representation of the load coming from the seven county Twin Cities metro area than the recognized 8 digit HUCs. The watershed boundary was manipulated to include political boundaries.

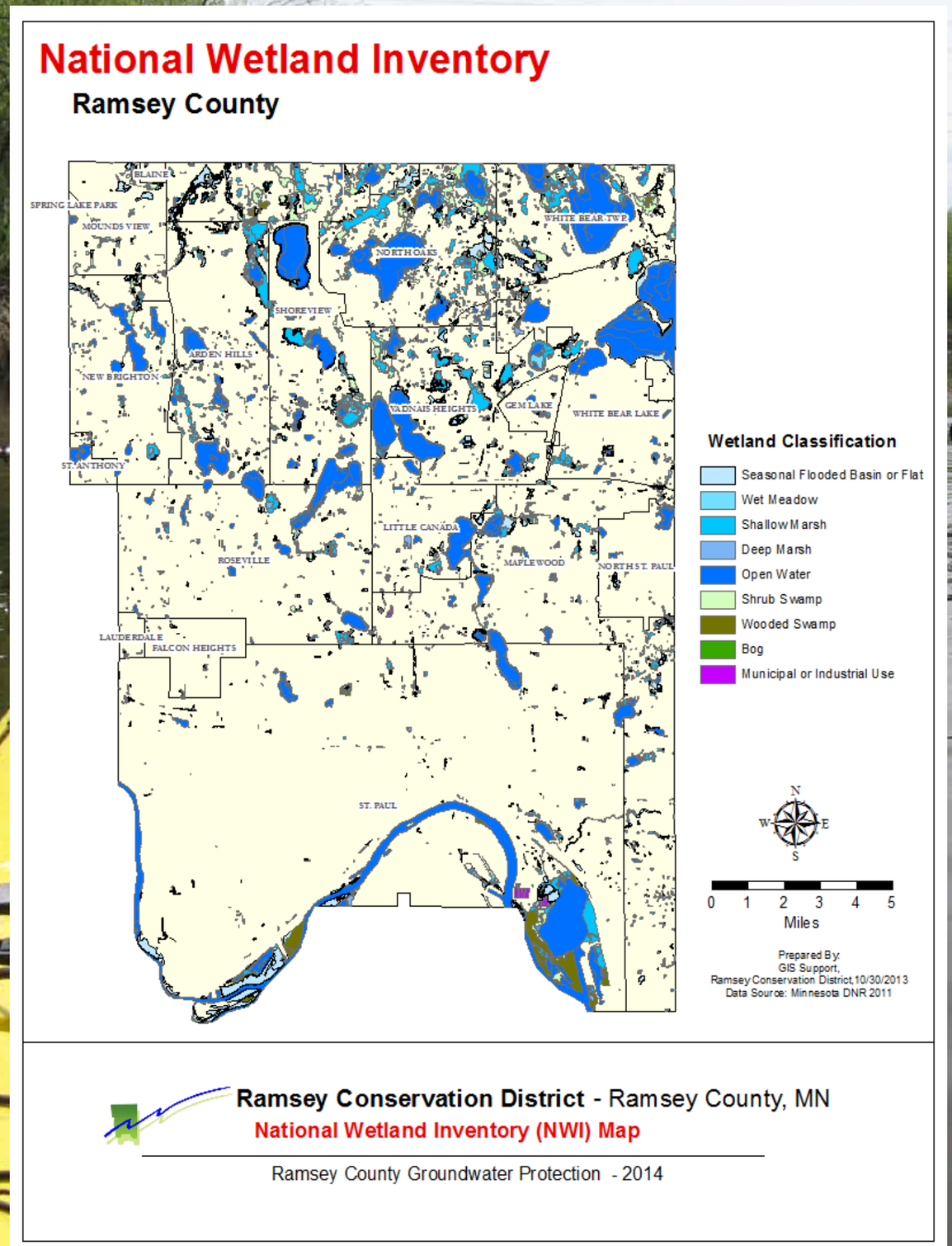
Where the Mississippi River and Minnesota River converge the Metroshed, the concentration of TSS for the Minnesota River declines. This study used sediment cores in Lake Pepin to determine the concentration of sediment loads from field erosion and non-field erosion causes. The study determined that 35% of sediment loads are derived from field erosion and 65% from non-field erosion. A 20% load reduction from the Upper Mississippi River Basin is required to meet the allocations for this TMDL. All of the RCD water quality improvement projects will provide reductions in TSS to help meet the overall watershed goal.

RICE CREEK

The Middle Rice Creek Assessment and Stabilization Feasibility Study evaluates the Rice Creek Watershed from the reach between Long Lake (in Ramsey County) and Baldwin Lake (in Anoka County). This reach is impaired due to accelerated erosion and sedimentation. This study recommends restoring the Middle Rice Creek, which the RCWD started at the end of 2015. The restoration will remeander this reach of Rice Creek. This project will reduce nitrogen and phosphorus loads, increase biomass, increase habitat, decrease flood peaks, and decrease suspended solids.

IMPAIRED WETLANDS

Wetlands are an important resource in the county. Wetlands remove pollutants from stormwater before entering lakes, streams, and groundwater. Wetlands also provide a habitat oasis for many species. The map on the next page shows the National Wetland Inventory in Ramsey County. Wetlands are not typically included on the EPA 303 (d) list of impaired waters due to the vast quantity and categories of wetlands. Jones wetland in New Brighton is considered an impaired wetland because it is biologically impaired for aquatic plant bioassessment and aquatic macroinvertebrate bioassessment as well as connected surficially to Pike Lake and Long Lake.



The RCD has been successful at accomplishing goals for high priority problems identified for the previous Comprehensive Plan period.

OVERVIEW OF 2012-2016 ACCOMPLISHMENTS

The RCD has been successful at accomplishing goals for high priority problems identified in the previous Comprehensive Plan period. In collaboration with our various partners, the RCD has addressed high priority areas and assisted landowners with the design and installation of numerous conservation projects.

From 2012 to 2016 the RCD has been involved in many different programs including environmental education events, a well sealing cost-share program, construction site erosion inspections, a water quality protection program, and administering the MN Wetland Conservation Act (WCA). Program accomplishments for some of the services provided are shown below in Table 2, and goal fulfillment is described in each section below.

Table 2: RCD Accomplishments 2012-2016

ACCOMPLISHMENTS	2012	2013	2014	2015	2016
MM Wetland Conservation Act protection activities	23	39	50	65	67
Provide citizens with cost share for sealing unused wells	62	42	52	80	11
Construction site erosion permit inspections for the Arden Hills, Shoreview, Rice Creek Watershed District	161	387	392	787	890
Site visits and clean water designs completed for water quality protection	289	447	412	325	628
State grant funding provided to landowners through the RCD for conservation projects	$246,082	$251, 354	$152,046	$131,274	$189,741
Host site Conservation Corps intern	x	x	x	x	x

WETLAND CONSERVATION

Wetlands protect water quality, recharge groundwater, and provide critical habitat for wildlife. Because over 80% of Ramsey County's presettlement wetlands have been destroyed, the number of protection activities are not expected to exceed 50-60 per year.

Serving on Technical Evaluation Panels (TEPs) is an SWCD statutory obligation under WCA law. These TEPs provide forums to discuss site-specific interpretation of law, rules, and technical data.

SEALING WELLS

Sealing abandoned/unused wells is key for groundwater protection. The RCD estimates that Ramsey County has over 13,000 abandoned wells. Priority was given to wells located in targeted wellhead protection areas and in drinking water supply areas. Since 2011, the RCD has sealed 305 wells and the majority of the wells were in Drinking Water Supply Management Areas. This program has been funded since 2011 by a Clean Water Fund grant. In 2016 the RCD did not meet the goal of sealing 50 inactive wells due to grant funds running out, but with Clean Water Funds for 2017, the program will continue by addressing the 50+ waitlisted wells and new applicants.

CONSTRUCTION SITE EROSION PERMIT INSPECTIONS

Site inspections are conducted to ensure construction projects are complying with the National Pollution Discharge Elimination System Permits (NPDES) program, which was created by the Clean Water Act of 1972 and authorized to the state by the Environmental Protection Agency, which was established in 1970 because of increased concerns about environmental pollution. This was three years after the Minnesota Legislature created the Minnesota Pollution Control Agency in 1967.

The RCD partners with the cities of Shoreview and Arden Hills to conduct inspections on active construction sites to ensure compliance with stormwater pollution prevention plans. Measures are taken to prevent sediment from eroding and moving into surrounding water bodies. The RCD also conducts inspections in other Ramsey County cities on behalf of the Rice Creek Watershed District.

SITE VISITS AND CLEAN WATER DESIGNS

The most requested service from the RCD is the site visits and raingarden/clean water designs to landowners interested in preventing flooding and erosion due to stormwater runoff. This program is fully funded by the watershed districts and water management organizations in Ramsey County. This coordinated effort promotes the efficient use of resources. There continues to be a waiting list for this service. The projects have increased in size and scope. In 2016, the RCD was able to hire an additional landscape designer (Conservation Technician) to meet the demand.

Site visits include projects with the Inspiring Communities Program in St. Paul. The program focus is on investing in neighborhoods most impacted by foreclosure and vacant properties- with the rehabilitation of vacant properties as an opportunity for neighborhood transformation.

LARGE PROJECTS

The RCD has received numerous grants from BWSR over the years. In 2011, 2014, and 2015 the RCD received Community Partner grants from the Clean Water Fund. This was a total of $450,000 for the implementation of larger scale infiltration basins. The funding is targeting schools, faith organizations, businesses, and homeowner associations. The installed projects are expected to reduce an estimated 9 million gallons of stormwater runoff, 27 pounds of phosphorus, and 7.5 tons of sediment annually.

VIII. RCD OBJECTIVES, STRATEGIES, AND ACTIONS

The identified objectives, strategies, and actions are expected to conserve and enhance the natural resources in Ramsey County and positively impact the Mississippi River, since all land area within Ramsey County ultimately drains to the Mississippi River. Conservation projects were further identified in the Biennial Budget Request submitted to BWSR. The RCD has identified seven high priority objectives.

GROUNDWATER

Conserve and Protect Groundwater

LAKES, RIVERS, CREEKS

Protect and Restore Surface Water

PUBLIC ENGAGEMENT

Increase Public Engagement Across All Communities

CLIMATE CHANGE

Adapt to Climate Variabilities

BIODIVERSE ECOSYSTEMS

Promote Biodiverse Ecosystems

URBAN AGRICULTURE

Increase Urban Agriculture Opportunities and Improve Soil Health

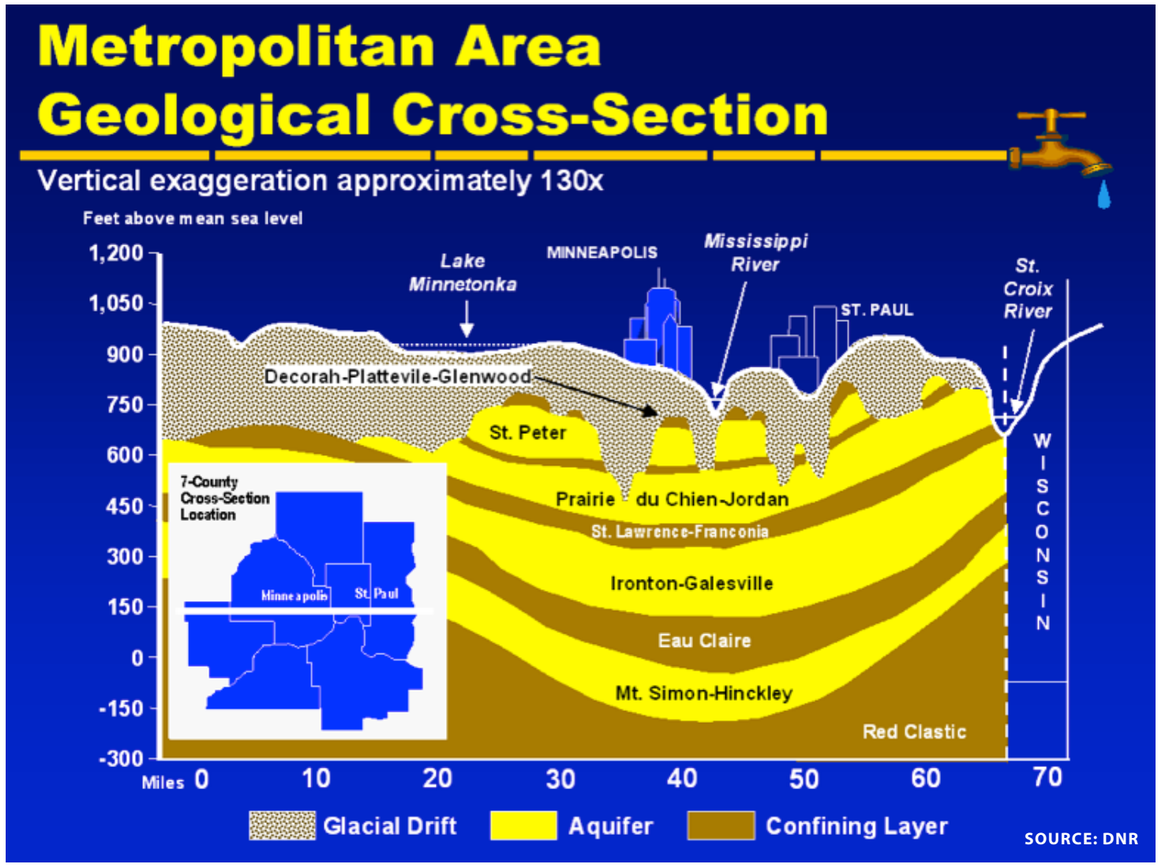
WETLANDS

Protect and Restore Wetlands

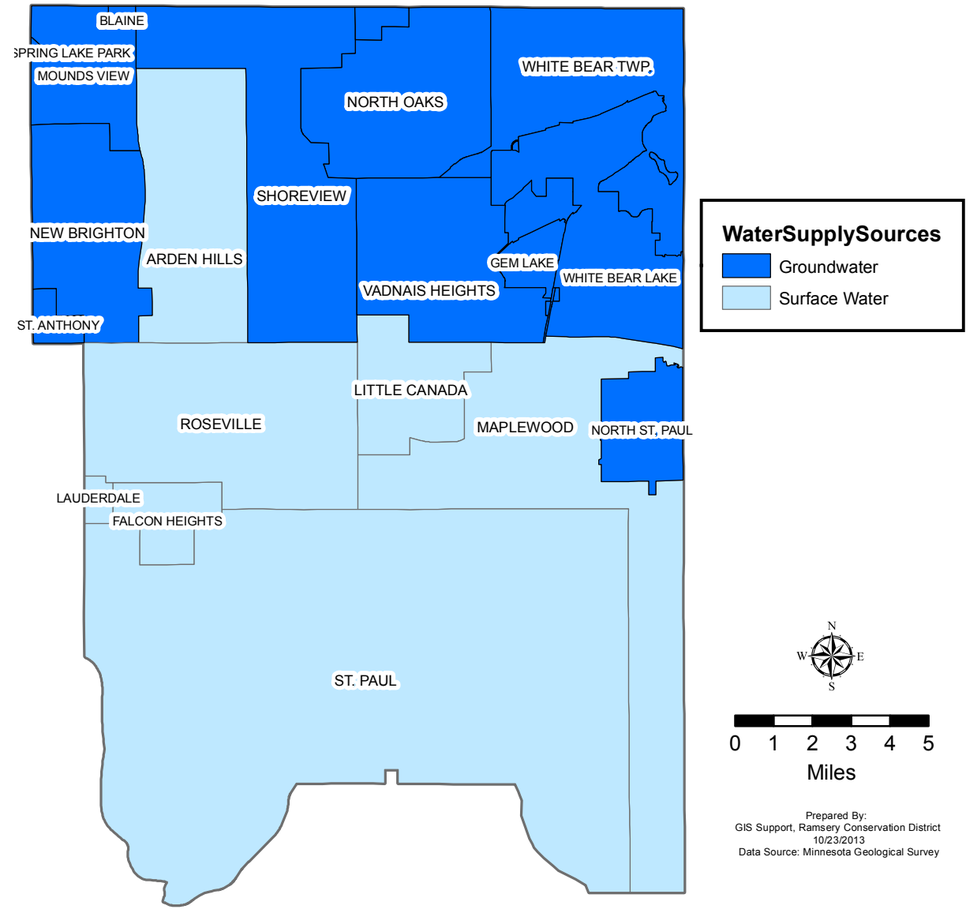
Objective 1:
CONSERVE AND PROTECT GROUNDWATER

Ramsey County is fortunate to currently have an abundant supply of groundwater. This supply of high-quality groundwater helps to sustain its potable, industrial, and commercial water use base as well as providing water to our lakes, streams, and wetlands. However, the Metropolitan Council's 2015 Metropolitan Area Master Water Supply Plan (https://metrocouncil.org/Wastewater-Water/Publications-And-Resources/WATER-SUPPLY-PLANNING/MASTER-WATER-SUPPLY-PLAN-2015/Master-Water-Supply-Plan,-Chapters-1-8.aspx) identifies the importance to plan for a sustainable water supply now and for future generations.

Approximately 75% of Minnesotans rely on groundwater for drinking water supply, while in Ramsey County only about 20% of the population relies on groundwater for their drinking water, though all County residents rely at least partially on groundwater for their water supply. The RCD Board has maintained groundwater protection measures to be their highest priority since 2008.



WATER SUPPLY SOURCE FOR RAMSEY COUNTY



The first approved Ramsey County Groundwater Protection Plan was published in 1996 and was completed by the RCD on behalf of the county. An updated plan was completed by the RCD in 2009, but due to extenuating circumstances, including budget cuts, the plan was never submitted to the Ramsey County Board of Commissioners or BWSR for approval. Recent discussions and regional planning efforts have renewed interest in an updated groundwater plan and more importantly, the development of action steps to conserve and protect this important resource. This is not a required plan in the seven metro area, though Minnesota Water Law Statute 103B.255 provides the authority for metropolitan counties to prepare and adopt county groundwater plans, and implement their policies. Completing this objective, along with all of the objectives identified in this plan, is also reliant on the provision of adequate funding, since SWCDs do not have taxing authority.

CONSERVE AND PROTECT GROUNDWATER

STRATEGY 1:

Reduce potential for groundwater contamination within Ramsey County by seeking funding to maintain RCD's Well Sealing Program

Actions

1. Seal an average of 20 unused private wells per year, with prioritization of wells located within a Drinking Water Supply Management Area (DWSMA)
2. Increase public awareness of wells as conduits of groundwater contamination by holding a yearly public forum on groundwater
3. Increase education and outreach efforts to private landowners in DWSMAs
4. Report yearly locations of sealed wells within their respective boundaries to water management organizations

STRATEGY 2:

Partner with groundwater authorities to maintain an accurate inventory of unsealed wells within Ramsey County

Actions

1. With data collected from the MN Department of Health (MDH), map 1000 sealed well locations per year and make the information accessible to all interested parties
2. Cross reference the RCD well inventory with the Minnesota Well Index, as developed by the Minnesota Geological Survey and MDH
3. Review 80 unpermitted dump sites in Ramsey County to examine for indications of groundwater impacts

STRATEGY 3:

Collaborate with Ramsey County to update their Groundwater Protection Plan

Actions

1. Secure authorization from the Ramsey County Board of Commissioners to complete the plan update
2. Invite Washington County staff to present to the RCD Board on their groundwater plan update experience
3. Host meetings with Ramsey County, local water management organizations, and state agencies to solicit support for the plan update process
4. Host regular meetings with the established Technical and Advisory Committees for the development of the plan update
5. Develop a timeline for the completion of the plan
6. Pursue grant funding opportunities
7. Revise and update the Ramsey County Groundwater Protection Plan

STRATEGY 4:

Reduce potential contamination from malfunctioning subsurface sewage treatment systems (SSTS) commonly called septic systems

Actions

1. Maintain an electronic inventory of all SSTS in Ramsey County
2. Work with MPCA to provide cost share for Ramsey County landowners to replace failing SSTS

STRATEGY 5:

Support and collaborate with Ramsey County, state, and regional agencies on groundwater protection efforts.

Actions

1. Encourage funding appropriations to develop an understanding of surface and groundwater interactions
2. Review local Wellhead Protection Plans from water suppliers
3. Participate in water conservation efforts
4. Complete a Campus Clean Water Grant Groundwater Audit Project with the MCD
5. Complete Observation Well Water Level Monitoring for the DNR
6. Assist with efforts to update the Ramsey County Geologic Atlas
7. Support groundwater recharge projects

"GROUNDWATER PROTECTION HAS BEEN THE RCD'S HIGHEST PRIORITY SINCE 2008."

In Ramsey County, only about 20% of the population relies solely on groundwater for their drinking water. However, ALL county residents rely at least partially on groundwater for their water supply.

75% OF MINNESOTANS RELY ON GROUNDWATER FOR DRINKING WATER SUPPLY

Objective 2:

PROTECT AND RESTORE SURFACE WATERS

Stormwater runoff is one of the most highly concentrated and contaminated sources of nonpoint pollution to our water resources. The RCD considers all lakes, wetlands, and waterways that receive stormwater runoff from disturbed soil areas and storm-sewered watersheds as most in need of protection and subject to chronic water-quality problems. Much of the drinking water supply for Ramsey County is provided via surface water, so protecting surface water is a high priority for the RCD.

> **“Much of the drinking water supply for Ramsey County is provided via surface water, so protecting surface water is a high priority for the RCD.”**

STRATEGY 1:

Increase the number of community accessible, water quality best management practices in targeted watersheds

Actions

1. Utilize Subwatershed Analyses to prioritize the implementation of funding and best management practices on an annual basis
2. Complete one Subwatershed Analysis Study per year for waterbodies listed as impaired due to excessive nutrients
3. Develop and apply for grants based on priority conservation concerns as they relate to surface water
4. Support programs and other efforts to install practices which improve surface water in all communities
5. Collaborate with partners to secure funding, create designs and leverage landowner cooperation to implement water resource protection and restoration projects in impaired watersheds
6. Collaborate to install a minimum of 12 BMPs per year
7. Collaborate to reduce a minimum of 3.0 lbs. of phosphorous per year
8. Collaborate to reduce a minimum of 1,440 cu-ft. [10,800 gallons] of runoff annually

STRATEGY 2:

Increase Technical Assistance and Collaboration Efforts

Actions

1. Hold internal program development workshops annually, to identify areas and opportunities for increased technical assistance
2. Increase technical capacity to adopt new technologies to achieve efficiency and enhance work products
3. Promote cross-training of technical staff within office and with regional partners
4. Continue apprenticeship opportunities for students to help with technical work at the District
5. Develop and apply for grants based on priority conservation concerns as they relate to surface water
6. Expand technical assistance for regional implementation
7. Conduct a minimum 250 site visits annually within the county
8. Complete a minimum 30 designs annually within the county
9. Hold quarterly meeting with Ramsey County Public Works Environmental staff and appropriate Ramsey County Parks and Recreation Staff to discuss potential partnerships on initiatives

STRATEGY 3:

Maintain the performance of constructed BMPs

Actions

1. Inspect existing stormwater best management practices on an annual basis
2. Enforce operation and maintenance contracts for grant funded projects during their lifespan
3. Develop and apply for grants to assist with the maintenance of constructed BMPs during their establishment period.
4. Actively track and map BMPs installed by the District

STRATEGY 4:

Increase awareness of surface water issues in Ramsey County

Actions

1. Hold forums for target groups to disseminate local issues and program information
2. Develop and/or circulate resources to target communities
3. Connect landowners, communities and local units of government with education and funding opportunities through social media
4. Assist partners with workshops on salt management in order to decrease chloride levels in metro water bodies

STRATEGY 5:

Increase vegetated buffers on local water resources

Actions

1. Continue to support programs and other efforts to install vegetated buffers
2. Establish new perennial vegetation buffers that will help filter out nutrients

STRATEGY 6:

Reduce the encroachment of anthropogenic development on lake shorelines and increase native vegetation buffers along shorelines

Actions

1. Reduce impervious surface and lawn coverage adjacent to lakes
2. Increase connectivity between aquatic and terrestrial habitat
3. Reduce lakeshore bank armoring where appropriate
4. Increase native vegetation buffers along shorelines
5. Increase bio-engineering techniques to stabilize lakeshore banks

STRATEGY 7:

Utilize new technologies/ innovations to provide increased accuracy and serve greater numbers of people

Actions

1. Train technical staff in the use of MCD's upgraded digital survey equipment
2. In an effort to improve efficiency and reduce paper waste, RCD staff will phase into utilizing digital tablet devices for field work
3. Provide yearly staff training on advanced uses in computer aided design software

STRATEGY 8:

Reduce and control excessive channel erosion in riparian ecosystems

Actions

1. Target projects that restore the structure and function of riparian habitat
2. Target projects that restore the vertical and lateral bank structures of waterbodies in Ramsey County
3. Promote practices that mimic natural hydrology, protecting and restoring channel and floodplain features where feasible
5. Provide assistance to landowners requesting support in: planning, alternate practices implementation, tracking compliance progress, and technical assistance

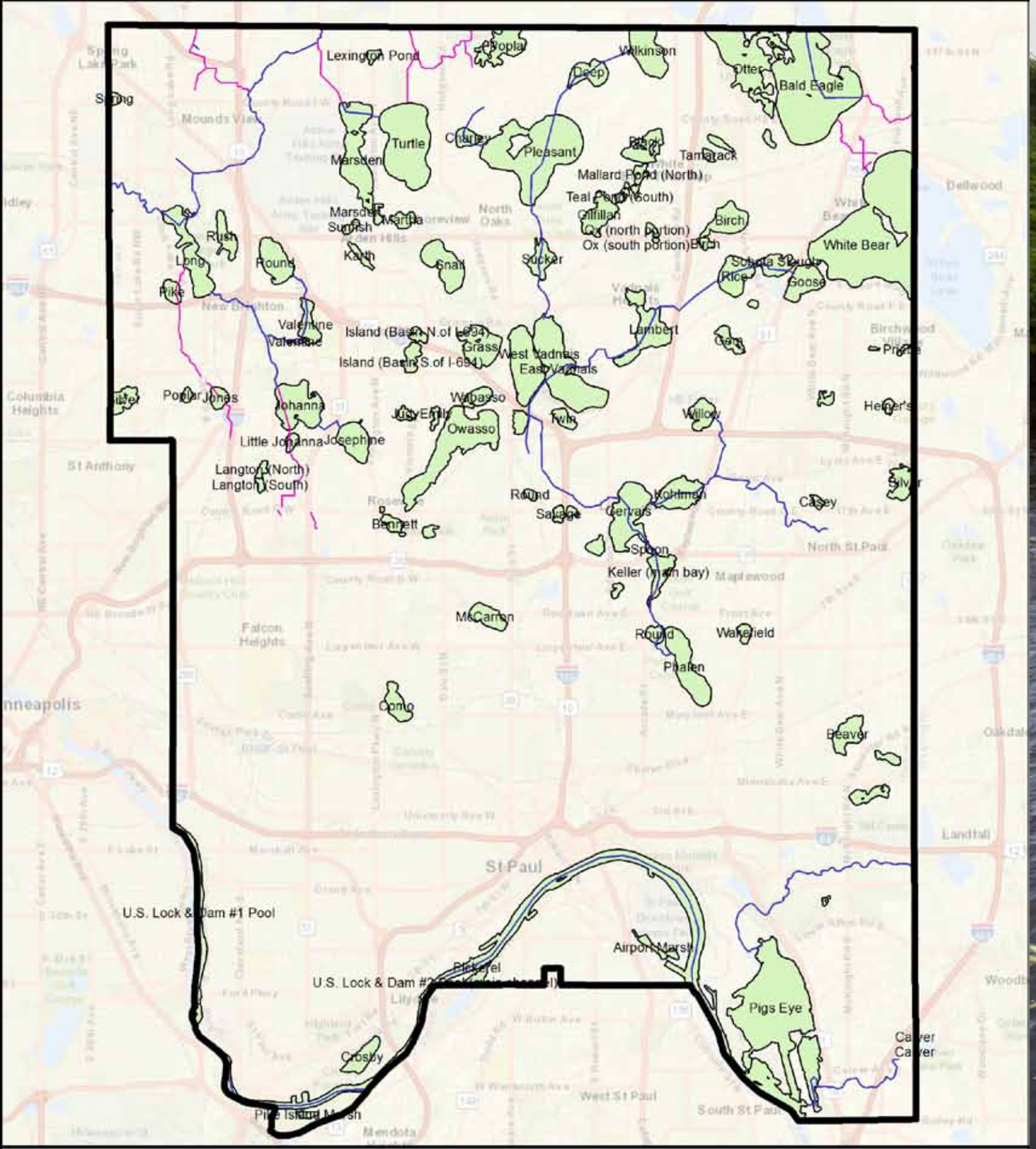
STRATEGY 9:

Assist Landowners and LGUs to Protect Surface Water in Accordance with the Buffer Law

Actions

1. Update website to show FAQs, links, and contact information for Buffer Law inquiries
2. Proactively search for compliance status in applicable parcels of Ramsey County
3. Contact appropriate parties when Non-Compliance is found
4. Regularly update Ramsey County parcel status on BWSR's online Buffer Compliance and Tracking Tool
6. Hold meetings to clarify Buffer Law requirements and responsibilities with Ramsey County, local water management authorities, and BWSR representatives
7. Consult with Watershed Districts and Water Management Organizations to develop a summary of other watercourses to include in local water management authorities' plans
8. Adopt a resolution establishing chosen watercourses to present to WMOs and BWSR by July 1, 2017
9. By 11/2/2018, adopt a plan for ongoing tracking of compliance, to be posted on our website

The confluence of the St. Croix and Mississippi rivers south of the Twin Cities after the Minnesota River flows into the Mississippi. This photo shows the contrast between Minnesota's river systems in urban and agriculture-dominated areas and more natural areas.



Water Bodies in Ramsey County, MN Subject to Buffer Law Protection

0 1.5 3 Miles

N

Ramsey County, Minnesota

Buffer widths

- Public Ditches - 16.5 ft
- Public Watercourses - 50 ft
- Public Water Basins - 50 ft

Ramsey Conservation District

Diagram: Minnesota Board of Water and Soil Resources

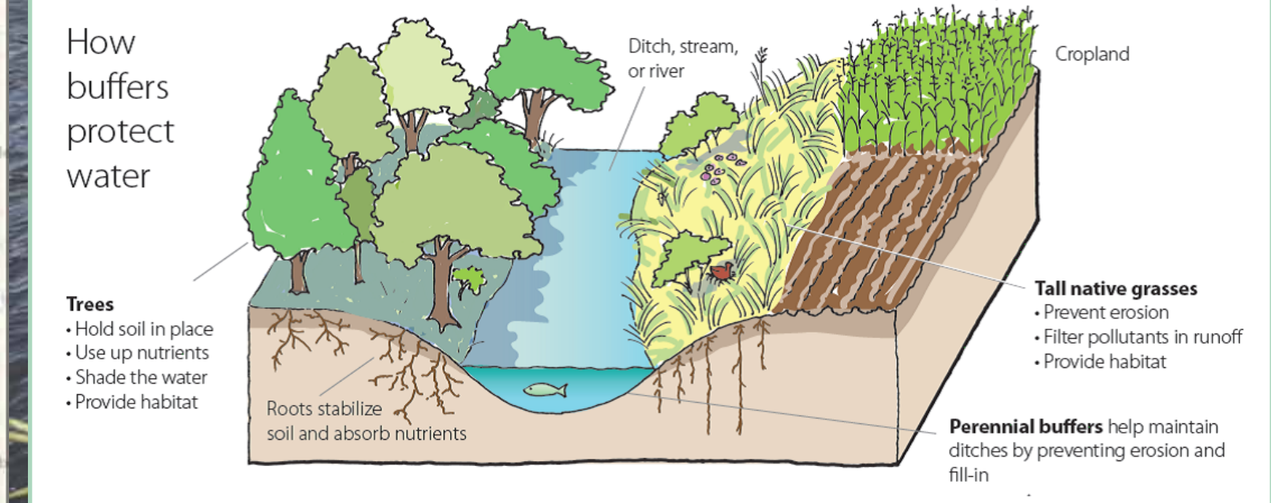


Photo: Star Tribune

Objective 3:
INCREASE PUBLIC ENGAGEMENT ACROSS ALL COMMUNITIES

Ramsey County is the smallest, most developed and demographically diverse county in Minnesota. It is also the most densely populated county. In order to achieve successful reductions in non-point source pollution, it will be imperative to engage the public throughout the county. Members of the public have ultimate ownership over public lands and waters; therefore, the public's needs and interests must be accounted for in all our conservation efforts. The RCD values the participation from citizens in water and natural resource planning efforts.

> **"In order to achieve successful reductions in non-point source pollution, it will be imperative to engage the public throughout the county."**

The RCD recognizes the diverse needs and expectations its citizens have towards natural resources. An overarching barrier to protecting water resources and habitat in an urban area is overcoming the detachment of the residents and natural resources. Over 75% of pre-development water sources and green space no longer exist and there is less opportunity for the public to interact with nature. The RCD continually strives to increase the community's connection with natural resources by reducing barriers and building access to natural resources.

STRATEGY 1:

Enthusiastically engage the public in the protection of natural resources and support the success of our stakeholders and partners.

Actions

1. Increase opportunities for the community to share their inspiring projects with others to increase participation in sustainable projects such as aingardens and pollinator plantings.
2. Publish and distribute a quarterly newsletter
3. Hold an annual tour of RCD conservation projects
4. Update outreach materials yearly that promote the RCD programs and services
5. Increase social media presence with at least one new post per month
6. Update the website as needed
7. Provide an online database of completed conservation projects for public accessibility
8. Provide nine Conservation Forums per year
9. Update the native plant display board for tabling events
10. Create email lists for different interest groups
11. Increase the volunteer rain gauge network, with a target of two new volunteers per year
12. Support educational efforts, such as pollinator puppet shows, etc., in K-12 schools to engage students in conservation efforts.

Actions (continued)

13. Support the success of cities and WMOs in their outreach efforts, such as RWMWD's Waterfest and the Metro Children's Water Festival
14. Provide opportunities to interact with diverse communities such as targeting internships to diverse population groups in identified areas of concentrated poverty and assisting with tree planting efforts, such as the Frogtown neighborhood's initiative to plant 1000 trees
15. Work with public leaders to increase the representation of all Ramsey County cultural, social, and political water resource needs
16. Apply for annual Conservation Corps member to assist with work plan
17. Continue to host the annual State of the Waters of Ramsey County event
18. Continue to administer the Volunteer Rain Gauge Network
19. Produce videos to highlight staff activities and outreach

MINNESOTA STATE FAIR

WHITE BEAR LAKE MARKET FEST

CHILDREN'S WATER FEST

CHILDREN'S WATER FEST

Objective 4:
ADAPT TO CLIMATE VARIABILITIES AND MINIMIZE FLOODING

2016's weather has broken records in Minnesota. The latest freezing date made the longest growing season and, at the time of writing, the second wettest year on record—all signs of an increasingly variable climate, as predicted by climate models for the region. As the most densely populated county in Minnesota, Ramsey County is especially vulnerable to higher-intensity storms because much of the county is developed and covered by impervious surfaces (i.e. roads, roofs, etc).

"In an age with greater variability in precipitation and temperatures, higher intensity of storms, wide variability in lake levels, and fewer days of freezing in our lakes, we must prepare for climatic variability and its impacts."

When the water cannot soak in, the risk of flooding is greater. The RCD is dedicated to reduce this vulnerability, which will help bring relief to landowners concerned with flooding. It will also improve water quality in lakes and streams suffering from increased runoff, often containing high levels of contaminants. In an age with greater variability in precipitation and temperatures, higher intensity of storms, wide variability in lake levels, and fewer days of freezing in our lakes, we must prepare for climatic variability and its impacts. Concerned citizens continue to contact local government offices looking for flood relief—in some cases the same citizens who, a few years ago, were concerned about drastically low lake levels.

Temperature also has impacts on Ramsey County's waters. 2016 was the third consecutive hottest year on record globally. According to the EPA, this region of Minnesota has risen in temperature by almost 3 degrees Fahrenheit in the last century, or about twice the national average for the contiguous 48 states, and this rate of warming is projected to increase. Temperature rise can have harmful effects on the water quality in local water bodies. Warmer water provides more favorable conditions for algal blooms, including toxic blue-green algae, which can consume available dissolved oxygen and harm aquatic life, or even humans. Through education, staff training, and collaborative problem-solving, the RCD is using adaptive strategies in response to the climatic changes discussed in this section to take responsible and proactive steps to help alleviate the additional stresses that these factors bring to Ramsey County's water bodies.

STRATEGY 1:
Community Education and Staff Training

Actions

1. Host a public Conservation Forum on Climate Variability and Adaptation and actions people can take to minimize their footprint and increase adaptive capacity in their communities
2. Hold a technical workshop for staff to update BMP design models to incorporate more intense precipitation events, in line with projected regional models, and to use the most updated floodplain delineations

STRATEGY 2:
Assist local governmental units (LGUs) in their capacity to prevent flooding at a local scale

Actions

1. Collaborate with LGUs to conduct Stormwater Interception Potential studies in catchments and 'sewersheds' of known areas of flooding to locate strategic areas to place BMPs to reduce stormwater volume and pollution levels.
2. Promote flood plain protection policies and conduct stormwater interception studies among local units of government
3. Alleviate stress on flood-prone water bodies by designing and implementing BMPs that infiltrate and filter runoff locally, thus lessening the loading of the stormwater conveyance system and improving water quality.

Objective 5:
PROMOTE BIODIVERSE ECOSYSTEMS

Seven ecoregions span Minnesota. Ramsey County is fully within the North Central Hardwood Forest ecoregion. Oak and Aspen savanna were the primary plant communities before European settlement. However, tallgrass prairie in the upland and maple-basswood forest along the river corridors were also common. The region also has an abundant number of lakes.

Presently, urban land uses dominate the county's landscape. There are remnants of the primary plant communities in areas that were preserved or once restored. Habitat loss and degradation are the most significant challenges facing biodiversity today in the county. Development throughout the county continues to expand, impacting the opportunities to conserve habitat for local and migratory species. Ramsey County Parks and Recreation identifies key habitat types and locations in their Natural Resources Management Plan (https://www.ramseycounty.us/sites/default/files/Environment/Natural%20Resources%20Management%20Plan.pdf) **that is currently being updated.**

STRATEGY 1:
Coordinate management or preclusion of invasive species

Actions

1. Maintain a cadre of trained coordinators and/or volunteers sufficient for program coordination, inspections, and management of invasive species
2. Develop terrestrial species management plans, and implement treatment projects that can eradicate, contain, and/or control prioritized invasive species in accordance with resource-related management goals
3. Support Ramsey County Cooperative Weed Management Area (CWMA) to address invasive weed management on lands within Ramsey County
4. Annually hold at least four stakeholder meetings for the CWMA

STRATEGY 2:
Increase the number of treated/monitored acres within the county

Actions

1. Conduct Aquatic Plant and Biological Surveys and monitoring for all species of concern, for known and unknown presence in Ramsey County, for early detection and to maximize the control options

STRATEGY 3:
Outreach to increase public understanding of biological impacts of invasive aquatic and terrestrial species on local resources

Actions

1. Hold one forum per year for target groups to disseminate local issues and program information
2. Collect and report information related to invasive species infestations, impacts and management activities
3. Complete macrophyte and biovolume studies on lakes and storm ponds

STRATEGY 4:
Use education & prevention to reduce the number of terrestrial and aquatic ecosystems at risk

Actions

1. Develop and update as necessary, priority sensitive plant lists and/or maps used to implement management strategies for protection
2. Develop and update as necessary, priority invasive species lists, maps and/or management plans that can be used to implement management strategies for eradication, containment or control of invasive species

STRATEGY 5:
Increase Pollinator Habitat

Actions

1. Evaluate opportunities to increase pollinator habitat on cost share projects
2. Work with Ramsey County to determine opportunities for establishing pollinator habitat within urban areas
3. Utilize native plants in all BMP project designs
4. Increase native plantings through high maintenance turf conversion

STRATEGY 6:
Coordinate the Aquatic Invasive Species (AIS) Prevention Program in Ramsey County

Actions

1. Provide AIS Coordinator
2. Provide seasonal staff to inspect boats at the 18 Ramsey County boat launch sites
3. Design and purchase signage for inspection areas
4. Conduct two yearly update meetings with Lakeshore Homeowners Associations
5. Maintain working relationships with committees, districts, boards, and other organizations at the local and state level that are involved with managing invasive species

Objective 6:
INCREASE URBAN AGRICULTURE OPPORTUNITIES

Though less than 1% of the land use in Ramsey County is agricultural, there is an increased social movement for sustainable communities, including an increase in community gardens and other urban agriculture initiatives. The RCD received a grant in 2016 from the National Association of Conservation Districts to increase the capacity to provide agricultural conservation technical assistance in communities where the land use is predominantly developed. The RCD will use this grant funding for new initiatives, as well as the implementation of a demonstration project. In addition, the RCD received funding to support the Minnesota Agricultural Water Quality Certification Program (MAWQCP), which is a voluntary program for agricultural landowners to implement conservation practices that protect water quality.

STRATEGY 1:
Provide technical assistance for agricultural initiatives

Actions

1. Host an annual workshop for agricultural landowners to learn about the MAWQCP, as well as federal funding available for the implementation of projects such as pollinator plantings
2. Provide site visits for any agricultural landowners interested in the MAWQCP
3. Provide oversight for the construction of an agricultural demonstration site in Ramsey County, including compost and a pollinator planting
4. Assist the NRCS to identify locations for their High Tunnel Pilot Program
5. Complete an inventory of all community gardens in Ramsey County
6. Make soil testing more available for community gardens

Objective 7:

PROTECT AND RESTORE WETLANDS

Wetlands protect water quality, recharge groundwater, provide flood control and provide critical habitat for wildlife. There are few natural wetlands that remain in Ramsey County due to the urbanization of the county. The RCD considers it a high priority to protect the remaining wetlands. RCD staff are qualified to delineate wetlands and assist local government units in administering the law. One of the statutory obligations for SWCDs, including the RCD, is to serve on Technical Evaluation Panels (TEP) under WCA. These TEPs provide forums to discuss site-specific interpretation of law, rules, and technical data. A small BWSR grant helps fund RCD staffs' wetland delineator training. RCD provides a portion of MN Wetland Conservation Act enforcement support and administration.

STRATEGY 1:

Seek the preservation of all wetlands within Ramsey County

Actions

1. Fulfill statutory obligations pursuant to the Wetland Conservation Act of 1991, as amended, including reporting violations of the law to the appropriate authorities
2. Serve on Technical Evaluation Panels
3. Administer the annual WCA grant from BWSR, as delegated by Ramsey County
4. Provide delineator training to all interested staff, with a minimum of two staff completing the Wetland Delineator Certification Program offered at the University of Minnesota
5. Provide guidance to landowners on wetland preservation and wildlife habitat improvement in wetlands
6. Assist local governmental units by conducting vegetation-based ecological assessments for wetland quality monitoring and evaluation in the county

Photo: East Metro Water Reosources Program

IX. PRESENT AND PROJECTED BUDGET AND STAFF

To better serve the citizens of Ramsey County, the RCD will continue to facilitate relations between Ramsey County and local governmental officials and natural resource protection agencies. The RCD has an informal agreement with Ramsey County Public Works to provide adjunct staff assistance on an as-needed basis. Also, additional grant funding and technical resource is available through the Association of Metro Conservation Districts (Joint Powers Authority) http://www.metrotsa4.org/ .

The RCD does not have the services of a full-time NRCS District Conservationist. However, there is NRCS assistance available through the area and state offices and a tri-county district conservationist stationed in Dakota County.

Assessing the staffing and financial resources needed to support future programs is an ongoing function of the RCD Board. Through the process of organizational and programmatic strategic planning, a continuing assessment of staffing needs and financial resources will be completed.

RAMSEY COUNTY CONTRIBUTION

To finance programs, the RCD relies on both financial and in-kind services from Ramsey County. The RCD benefits greatly from both financial and in-kind Ramsey County resources including:

IN-KIND SERVICES

Accounting and payroll oversight, cash flow management, liability insurance, legal (Ramsey County Attorney), technical, and access to office equipment and fleet vehicles. RCD employees participate in the County Employee Benefit Plan.

OFFICE SPACE

Since October 2004, the RCD has been a partner in the ownership and occupancy of the Ramsey County Public Works campus in Arden Hills.

FINANCIAL

Ramsey County approves the RCD's biennial budget and provides approximately $30,000/year in tax levy funding to the RCD. In addition, half of the $5.00 Agricultural Conservation Fee paid to counties for registration of all property title and deeds has been designated for RCD operations by the Ramsey County Board of Commissioners since 1988. This funding is directly related to real estate/mortgage finance transactions in Ramsey County. Currently collections are about $70,000/year – less than half of the 2005 level. Since SWCDs do not have taxing authority, they must rely on county government to supplement their operating expenses.

GRANT FUNDING

Grants have been an increasing portion of the RCD's revenue stream. This trend, however, may change depending on how successful the RCD is at acquiring grants. Annual BWSR grants provide funding to local units of government to deliver soil and water conservation services to their communities. Grant funds support and increase local capacity to implement programs and provide cost-share with landowners who install conservation practices on their land to benefit state water and soil resources.

Minnesota voters approved the Clean Water, Land and Legacy Amendment in 2008 to increase the state sales tax by three-eighths of one percent and dedicate this funding for natural resources and cultural heritage. Every precinct in Ramsey County voted in favor of this amendment to increase their taxes for the next 25 years to protect, enhance and restore Minnesota's lakes, rivers, streams and groundwater. This funding source has been critical for SWCDs to get projects implemented, though the grant application process is highly competitive and there are consistently more applications than funding available.

CLEAN WATER LAND & LEGACY AMENDMENT

PARTNERSHIPS AND FEE FOR SERVICES

The RCD has become less dependent on county revenues by providing technical and administrative services to other units of government (fee for service revenue). The services we deliver are consistent with the RCD's priorities to assist landowners as stewards of land and water resources. In 2015, fee for service revenues were approximately 60% of the RCD's revenue stream. To sustain this revenue source, RCD staff will need to maintain technical capacity in applied technologies for natural resource management and to further diversify staff capacity to meet changing demands for services. The RCD offers a cost-effective option to assist local government agencies accomplish natural resource protection standards.

The RCD assists Ramsey County, WDs, WMOs, and cities by managing conservation practice cost-share programs, conducting sediment and erosion inspections, completing sub-watershed retrofit studies, providing GIS support through mapping and analysis of conservation data, assisting landowners solve soil erosion and water management problems, and supporting the internal technical needs of these partner organizations.

BUDGET NEEDS 2017 TO 2025

Pages 72 and 73 provide an operational budget forecast, with a nominal increase for the following year. In addition, the RCD maintains a project budget to provide funding for the installation of projects that will improve and protect the natural resources of Ramsey County. The project budget is dependent on successful grant applications, which are impossible to predict, but the current project budget (December, 2016) is $1,515,864, which is approximately triple our operating budget.

CURRENT STAFFING

The permanent RCD staff consists of six full-time employees:

District Manager	Budget preparation and financial tracking, personnel management, work plan development, Board support, grant writing and management, website management
Conservation Design Specialist	Assist landowners with Best Management Practice (BMP) design, funding and installation, grant writing
Natural Resource Specialist	Wetland Conservation Act compliance assistance, assist landowners with BMP design, funding and installation, grant writing
Environmental GIS Technician	Complete subwatershed analysis studies, erosion control concerns on construction site, well sealing cost-share program, G.I.S. mapping, lake surveys
Conservation Technician	Assist landowners with Best Management Practice (BMP) design, funding and installation, grant writing
Assistant District Technician	Coordinate the Aquatic Invasive Species and Agriculture Certification programs, education and outreach efforts, Conservation Forum

Joe Lochner	Brian Olsen	Michael Schumann	Andrea Prichard	Layne Warner	Ashley Bennett	Ann White Eagle
Conservation Design Specialist	Conservation Technician	Natural Resource Specialist	Environmental GIS Technician	2016 Conservation Corps Member	Assistant District Technician	District Manager

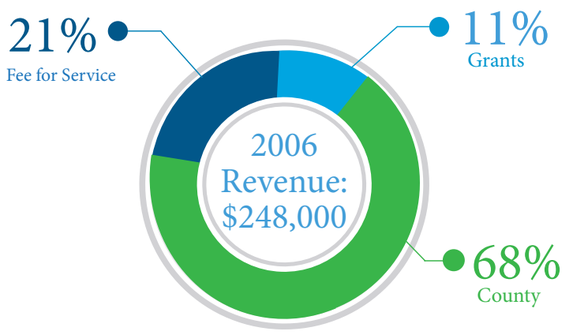
RCD Operation Budget Projection	2017	2018	2019	2020	2021	2022	2023	2024	2025
REVENUES									
County Funds	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Ag Fee Appropriation	70,000	70,700	71,407	72,121	72,842	73,570	74,305	75,048	75,798
State Grant Funding	155,090	160,000	165,000	170,000	175,000	180,000	185,000	190,000	195,000
Federal Grant Funding	15,000	10,000	—	—	—	—	—	—	—
Fee-for-Tech Services	220,000	229,792	244,694	249,802	255,119	260,651	266,400	272,371	278,570
TOTAL REVENUE	520,090	530,492	541,101	551,923	562,961	574,221	585,705	597,419	609,368
EXPENDITURES	438,554	447,325	456,272	465,397	474,705	484,199	493,883	503,761	513,836
Personnel	71,466	72,895	74,353	75,840	77,357	78,904	80,482	82,092	83,734
Operating Expenditures	10,070	10,271	10,476	10,686	10,900	11,118	11,340	11,567	11,798
Total Expenditures	520,090	530,492	541,101	551,923	562,961	574,221	585,705	597,419	609,368
RCD Project Budget Estimate	1,515,864	740,864	800,000	800,000	800,000	800,000	800,000	800,000	800,000

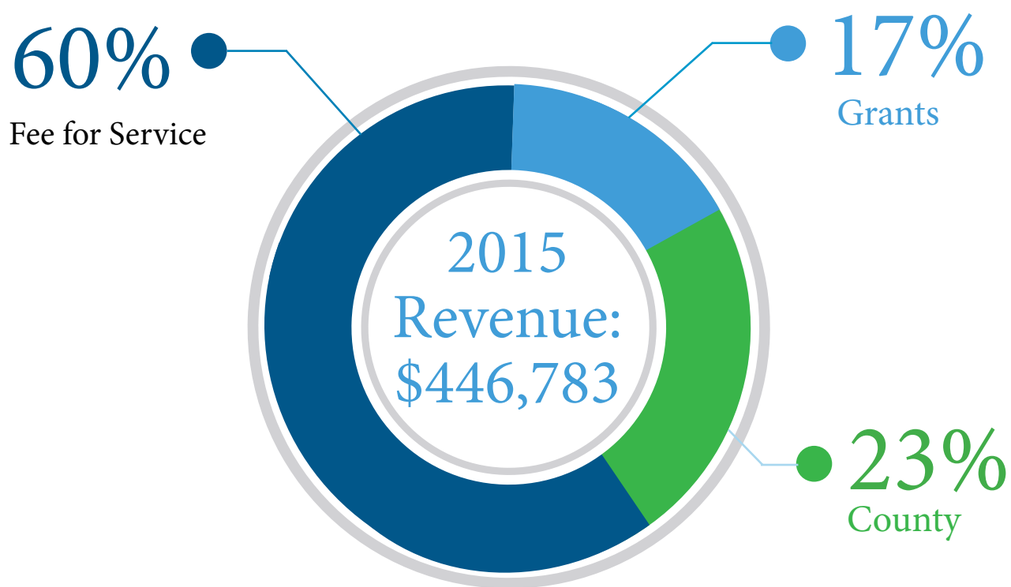
> To better serve the citizens of Ramsey County, the RCD will continue to facilitate relations between Ramsey County and local governmental officials and state and federal natural resource protection agencies.

The RCD achieves cost efficiency for taxpayers by standardizing protection activities, increasing coordination among agencies, and identifying and minimizing functional overlap among agencies.

RCD FUNDING

Over the course of the last Comprehensive Plan (2011-2016) the RCD has doubled the full-time staff, while increasing the reserve fund for each of those years. The RCD has a talented and highly trained workforce, who have effectively adapted to the challenging and changeable workload. The RCD Board of Supervisors have successfully set policies and long range goals for the staff to implement. This alignment of mission and vision has led to operational efficiency and an increased benefit to the natural resources and citizens who live in Ramsey County.





X. CONCLUSION

In a year where Minnesota's Governor Mark Dayton declared, "A Year of Water Action", we see many great opportunities for the RCD to work together with fellow Minnesotans to protect water and all natural resources for future generations. The RCD will continue to seek new ways to coordinate conservation efforts and innovative partnerships that share our common goals that include clean drinking water for all, swimmable and fishable lakes, and sustainable groundwater supplies.