BOARD OF WATER AND SOIL RESOURCES
520 LAFAYETTE ROAD NORTH
ST. PAUL, MN 55155
WEDNESDAY, SEPTEMBER 28, 2022

AGENDA

9:00 AM CALL MEETING TO ORDER

PLEDGE OF ALLEGIANCE

ADOPTION OF AGENDA

MINUTES OF AUGUST 25, 2022 BOARD MEETING

PUBLIC ACCESS FORUM (10-minute agenda time, two-minute limit/person)

INTRODUCTION OF NEW STAFF

- Jed Chestnut, Wetland Specialist
- Brittany Polzin, Easement Acquisition Specialist Sr.
- Ashley Rezachek, Communication Specialist

CONFLICT OF INTEREST DECLARATION

A conflict of interest, whether actual, potential, or perceived, occurs when someone in a position of trust has competing professional or personal interests, and these competing interests make it difficult to fulfill professional duties impartially. At this time, members are requested to declare conflicts of interest they may have regarding today's business. Any member who declares an actual conflict of interest must not vote on that agenda item. All actual, potential, and perceived conflicts of interest will be announced to the board by staff before any vote.

REPORTS

- Chair & Administrative Advisory Committee – Gerald Van Amburg
- Executive Director – John Jaschke
- Audit & Oversight Committee – Joe Collins
- Dispute Resolution and Compliance Report – Travis Germundson/Rich Sve
- Grants Program & Policy Committee – Todd Holman
- RIM Reserve Committee – Jayne Hager Dee
- Water Management & Strategic Planning Committee – Joe Collins
- Wetland Conservation Committee – Jill Crafton
- Buffers, Soils & Drainage Committee – Mark Zabel
- Drainage Work Group – Neil Peterson/Tom Gile

AGENCY REPORTS

- Minnesota Department of Agriculture – Peder Kjeseth
- Minnesota Department of Health – Mark Wettlaufer
- Minnesota Department of Natural Resources – Sarah Strommen
- Minnesota Extension - John Bilotta
- Minnesota Pollution Control Agency – Katrina Kessler

ADVISORY COMMENTS

- Association of Minnesota Counties – Brian Martinson
- Minnesota Association of Conservation District Employees – Nicole Bernd
- Minnesota Association of Soil & Water Conservation Districts – LeAnn Buck
- Minnesota Association of Townships – Eunice Biel
- Minnesota Association of Watershed Districts – Jan Voit
- Natural Resources Conservation Service – Troy Daniell

COMMITTEE RECOMMENDATIONS

Dispute Resolution Committee

1. WCA Appeal File 21-1 of a Notice of Decision for a No-Loss -Kittson County – Rich Sve, Oliver Larson, Travis Germundson – ***DECISION ITEM***

Grants Program and Policy Committee

1. Environment and Natural Resources Trust Fund (ENRTF) Watershed and Forest Restoration: What a Match! Project Partner Grants and Agreements – Lindberg Ekola and Ryan Hughes – **DECISION ITEM**

NEW BUSINESS

1. 2023 BWSR Board Meeting Schedule –John Jaschke/Rachel Mueller – ***DECISION ITEM***
2. BWSR Climate Change Trends and Action Plan – Suzanne Rhees and Dan Shaw – ***INFORMATION ITEM***

UPCOMING MEETINGS

- Northern Region Committee meeting is scheduled for 10:00 AM on October 5, 2022 in Detroit Lakes.
- Central Region Committee meeting is scheduled for 2:00 PM on October 6, 2022 in St. Paul and by Microsoft Teams.
- Grants Program and Policy Committee meeting is scheduled for 8:30 AM on October 24, 2022 in St. Paul and by Microsoft Teams.
- Next BWSR meeting is tentatively scheduled for 9:00 AM, October 26, 2022 by WebEx.

ADJOURN

BOARD OF WATER AND SOIL RESOURCES
514 GATEWAY DRIVE NORTHEAST
EAST GRAND FORKS, MN
THURSDAY, AUGUST 25, 2022

BOARD MEMBERS PRESENT:
Jill Crafton, Jayne Hager Dee, Kurt Beckstrom, Carly Johnson, Neil Peterson, Rich Sve, Gerald Van Amburg, Ted Winter, LeRoy Ose, Kelly Kirkpatrick, Todd Holman, Ronald Staples, Mark Zabel, Glenn Skuta, MPCA; Jeff Berg, MDA; Mark Wettlaufer, MDH; Theresa Ebbenga, DNR

BOARD MEMBERS ABSENT:
Joe Collins, Eunice Biel, Rich Sve, Joel Larson, University of Minnesota Extension

STAFF PRESENT:
John Jaschke, Rachel Mueller, Tom Gile, Mike Nelson, Julie Westerlund, Pete Waller, James Adkinson, Matt Fischer

OTHERS PRESENT:
Brian Martinson, AMC; Nicole Bernd, MACD; Mori Maher, MSTRWD; John Waller, RCWD

Chair Gerald VanAmburg called the meeting to order at 8:39 AM

PLEDGE OF ALLEGIANCE

** 22-32 **ADOPTION OF AGENDA –** Moved by Neil Peterson, seconded by Jill Crafton, to adopt the agenda as amended to introduce a new staff member. ***Motion passed on a voice vote***.

** 22-33 **MINUTES OF JUNE 22, 2022 BOARD MEETING** – Moved by Todd Holman, seconded by Jill Crafton, to approve the minutes of June 22, 2022, as circulated. ***Motion passed on a voice vote.***

PUBLIC ACCESS FORUM
No members of the public provided comments to the board.

CONFLICT OF INTEREST DECLARATION

Chair Van Amburg read the statement:
"A conflict of interest, whether actual, potential, or perceived, occurs when someone in a position of trust has competing professional or personal interests, and these competing interests make it difficult to fulfill professional duties impartially. At this time, members are requested to declare conflicts of interest they may have regarding today's business. Any member who declares an actual conflict of interest must not vote on that agenda item. All actual, potential, and perceived conflicts of interest will be announced to the board by staff before any vote."

INTRODUCTION OF NEW STAFF
John Jaschke introduced Craig Engwall, Senior Legal and Program Advisor.

REPORTS
Chair & Administrative Advisory Committee – Chair Gerald Van Amburg thanked those that worked on the programs and tour. Stated MNDOT Comm. Nancy Daubenberger has been named chair of the Environmental Quality Board.

Executive Director's Report - John Jaschke reported Craig Engwall and Melissa King will be working on increasing tribal connections. Stated they are working on the Diversity Equity and Inclusion Plan, which Jenny Gieseke will bring to the board at a future date. John stated he worked with Chair Van Amburg on the Risk Management Assessment Report that will be submitted to MMB. Stated the Outdoor Heritage Council is meeting and toured the west central area of Minnesota. The tour included BWSR staff showing sites accomplished through the Grassland Program. The Outdoor Heritage Council is working on recommendations for Legislation. LCCMR is meeting on the proposals they received. The Clean Water Council has been meeting and have released their preliminary recommendations on funding.

John reviewed the Day of Packet that include the Drainage Work Group Report, One Watershed One Plan Program Update, and Snapshots.

Audit and Oversight Committee – No report was provided.

Dispute Resolution and Compliance Report – Chair Van Amburg reported there will be a committee meeting on August 31st. John Jaschke reviewed the Dispute Resolution and Compliance Report included in the board packet.

Grants Program & Policy Committee – Todd Holman thanked the team for the work on the tour and meetings. Stated there are action items on the agenda for today. The committee adopted a standing meeting that will be on the fourth Monday of every month. It will be in person at the St. Paul office with a Teams link available. Stated the Committee has been discussing the watershed-based implementation funding formula.

RIM Reserve Committee – Jayne Hager Dee reported they have not met.

Water Management & Strategic Planning Committee – No report provided.

Wetland Conservation Committee – Jill Crafton reported they have not met.

Buffers, Soils & Drainage Committee – Mark Zabel reported they have not met.

Drainage Work Group (DWG) – Neil Peterson and Tom Gile reported they have met twice and discussed outlet adequacy and the drainage registry bill from the 2022 Legislature.

AGENCY REPORTS

Minnesota Department of Agriculture – Jeff Berg reported Commissioner Petersen is at the State Fair. Stated they are working on endorsements for the Minnesota Ag Water Quality Certification. Drought relief checks went out this week. Stated complaints are down this year for the herbicide dicamba that is used to control weeds. The Groundwater Protection Rule restricts nitrogen fertilizer application in the fall and will start on September 1, 2022.

Minnesota Department of Health – Mark Wettlaufer reported they are working on updating their wellhead protection rule. Stated the Source Water Protection Grants Program has grants available to implement wellhead plans.

Minnesota Department of Natural Resources – Theresa Ebbenga reported the Northwest Region has been involved with One Watershed One Plan and appreciates the opportunity to be involved. Stated they are working on their legislative budget for next year. They are also involved with flood damage reduction projects in the area.

Minnesota Extension – No report provided. Chair Van Amburg stated the Minnesota Water Resources Conference is October 18 and 19, 2022.

Minnesota Pollution Control Agency – Glenn Skuta thanked those involved in organizing the tour. Stated the WRAPS for Cottonwood River will be going on notice in September. The Redwood River will be going on public notice by the end of the year. Stated they hired new staff manager Heather Johnson in Southern Minnesota.

ADVISORY COMMENTS

Association of Minnesota Counties – Brian Martinson thanked those that organized the tour. Stated the Local Water Government Roundtable presented to the Clean Water Council. Comments were focused on the need for implementation funding for One Watershed One Plan and Comprehensive Watershed Plans. AMC is beginning its policy development work with the AMC Fall Policy Conference September 14-16 at Arrowwood in Alexandria.

Minnesota Association of Conservation District Employees – Nicole Bernd reported they have an education grant program that districts throughout the state can apply and can receive up to $1,000 on a project that is tied into education on soil and water. They are planning on having another joint meeting with Watershed District Administrators and stated the first one was successful. Will be having a board meeting on September 22 and will have a gathering at the BWSR Academy in October.

Minnesota Association of Soil & Water Conservation Districts – No report provided. Kurt Beckstrom stated the MASWCD Board had a retreat in St. Cloud last week.

Minnesota Association of Townships – No report was provided.

Minnesota Association of Watershed Districts – No report was provided. John Jaschke stated the Administrators meeting was on Tuesday. Stated Emily Javens resigned and the MAWD staff role is temporarily being filled by Jan Voit. The new MAWD president is Linda Vavra, BdSWD.

Natural Resources Conservation Service – No report was provided.

Chair Van Amburg recessed the meeting at 9:49 a.m. and called the meeting back to order at 10:03 a.m.

COMMITTEE RECOMMENDATIONS

Grants Program and Policy Committee

One Watershed, One Plan Planning Grants Authorization – Julie Westerlund presented One Watershed, One Plan Planning Grants Authorization.

The calendar year 2022 (FY23 grants) One Watershed, One Plan Planning Grants request for proposal (RFP) period opened on March 26, 2022 and closed on June 11, 2022. BWSR received five proposals. Staff reviewed the five proposals (locations shown on attached map) against the RFP selection criteria and received feedback from the Interagency Water Management and Implementation Team on June 29, 2022. BWSR's Senior Management Team reviewed staff recommendations on July 12, 2022, and recommended funding all five proposals. Grants Program and Policy Committee reviewed this recommendation on July 25, 2022.

Funds are from the 2020-2021 biennium, Laws of Minnesota 2019, 1st Special Session, Chapter 2, Article 2, Section 7(i) and the 2022-2023 biennium, Laws of Minnesota, 2021, 1st Special Session, Chapter 1, Article 2, Section 6 (i) for assistance, oversight, and grants to local governments to transition local water management plans to a watershed approach as well as previously returned clean water fund grants.

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22-34 Moved by Neil Peterson, seconded by Jill Crafton, to approve the One Watershed, One Plan Planning Grants Authorization. ***Motion passed on a voice vote.***

Soil Health Cost Share Grant – Tom Gile presented Soil Health Cost Share Grant.

The Laws of Minnesota 2021, 1st Special Session, Chapter 6, Article 1, Section 4(K) appropriated $675,000 for both fiscal years 2022 and 2023 for soil heath practice adoption purposes consistent with the cost-sharing provisions of Minnesota Statutes, section 103C.501, and for soil health program responsibilities in consultation with the University of Minnesota Office for Soil Health.

The Soil Health Cost Share Grant program combines FY22 and FY23 General Fund dollars for the implementation of soil health practices and the necessary staff time needed for technical assistance and

grant program administration. Available funding will be split equally between Minnesota's soil and water conservation districts. The Policy has been developed primarily using the existing Erosion Control and Water Management Policy but includes a list of core soil health practices.

Kurt stated this program will complement climate smart agriculture coming down the road.

Mark Wettlaufer asked if the Board Conservationists will review work plans. Tom stated the Board Conservationists will work through it with SWCDs.

** 22-35 Moved by Kurt Beckstrom, seconded by Ron Staples, to approve the Soil Health Cost Share Grant. ***Motion passed on a voice vote.***

FY22 and FY23 Clean Water Fund Soil Health Grants – Tom Gile presented FY22 and FY23 Clean Water Fund Soil Health Grants.

In 2021, the Minnesota Legislature, in the first Special Session, passed Chapter 1, article 2, Sec. 6(p) (Clean Water Fund Appropriations). The original round of Clean Water Fund Soil Health Grants RFP was released this spring. We received 8 applications for a total request of approximately 2.1 million dollars. An interagency scoring team has reviewed the applications submitted and is recommending funding 7 of the 8 applications for approximately 2 million dollars.

This Grant program combines FY22 and FY23 appropriation dollars. Priority for this program is being given to new adoption and understanding of soil health practices through the following efforts: Building local knowledge; Facilitating partnerships; Demonstrating clean water benefits; Identifying methods to increase long term adoption of soil health practices; and Scope and scale of implementation efforts in locally prioritized areas that show a direct benefit to public water supplies.

The first Clean Water Fund Soil Health Grant RFP was released this spring and the recommendations for funding are included in this action item. The submitted applications have been reviewed and scored by an interagency scoring team consisting of membership from MDH, MDA, MPCA, DNR, and BWSR. That team has forwarded the attached funding recommendations for Board consideration. A second round RFP for this program was also available during the BWSR Competitive Clean Water Fund application cycle which closed earlier in August.

Ron Staples asked what GBERBA stands for. Tom stated it stands for the Greater Blue Earth River Basin Alliance.

** 22-36 Moved by Mark Zabel, seconded by Neil Peterson, to approve the FY22 and FY23 Clean Water Fund Soil Health Grants. ***Motion passed on a voice vote.***

FY2023 Buffer Implementation Grants – Tom Gile presented FY2023 Buffer Implementation Grants.

This is the annual Grant support funding for SWCD's role to provide planning, technical and implementation assistance to landowners under 103F.48 (Buffer Law) as well as their annual monitoring and reporting on compliance status.

Ted Winter asked if they would need to inform the Clean Water Council of the ongoing effort of monitoring buffers. Tom stated to bring these dollars forward they will come through the Clean Water Fund or another appropriation to provide the resources to the district. John Jaschke stated counties and

watershed districts are responsible for the compliance and both get a direct appropriation from the Department of Revenue.

Jill Crafton asked if they are looking at diversity in these buffers and if they are increasing diversity. Tom stated there are landowners who did what was necessary to come into compliance where others did alternative practices on what they thought was a better fit. Stated there are no specific requirements for diversity as perennial vegetation is the standard.

Kelly Kirkpatrick asked if there is data showing an economic benefit where a larger buffer is not a negative feature on the space being farming. Tom stated putting a dollar amount on it would be challenging as some are used for hay and others are reducing ditch maintenance costs.

** 22-37 Moved by Jayne Hager Dee, seconded by Kurt Beckstrom, to approve the FY2023 Buffer Implementation Grants. ***Motion passed on a voice vote***.

Northern Region Committee

Middle-Snake-Tamarac Rivers Comprehensive Watershed Management Plan – Matt Fischer and Nicole Bernd presented Middle-Snake-Tamarac Rivers Comprehensive Watershed Management Plan.

The Middle-Snake-Tamarac Rivers Watershed Planning Partnership established a Memorandum of Agreement between the planning partners for the purposes of writing a Comprehensive Watershed Management Plan in May of 2020 and was approved for a One Watershed, One Plan planning grant in August of 2020. The partners include Marshall County, Marshall Soil and Water Conservation District (SWCD), Polk County, West Polk SWCD, and Middle-Snake-Tamarac Rivers Watershed District.

The partnership held a 60-day review process that ended on June 27, 2022, and the required public hearing on July 13, 2022. The final draft of the updated Plan, a record of the public hearing, and copies of all written comments were submitted to the state review agencies on July 19, 2022. The partnership has incorporated most of the agency and public comments received throughout the Plan development process. Final state review agency comments were submitted by July 29, 2022, and all agencies that submitted comments recommended approval.

The Northern Regional Committee met on August 3, 2022, to review the content of the Plan, State agency comments on the Plan, and to make a recommendation. The Committee recommends approval of the submitted Plan by the full Board.

Neil Peterson stated it was great that they pushed this through.

Theresa Ebbenga stated the quality of these reports and increased coordination has been tremendous. Stated their staff had positive things to say.

Glenn Skuta stated he also heard positive things from his staff.

Mark Zabel is happy to see One Watershed One Plan do what it should be doing.

** 22-38 Moved by LeRoy Ose, seconded by Neil Peterson, to approve the Middle-Snake-Tamarac Rivers Comprehensive Watershed Management Plan. ***Motion passed on a voice vote***.

UPCOMING MEETINGS

- Next BWSR Meeting is scheduled for 9:00 AM, September28, 2022 in St. Paul and by WebEx.
- Dispute Resolution and Compliance Committee meeting scheduled for 1:00 PM, August 31, 2022 in St. Paul.

Chair VanAmburg adjourned the meeting at 11:10 AM

Respectfully submitted,

Gerald Van Amburg
Chair

Drainage Work Group Report
September 28, 2022 BWSR Board Meeting
Tom Gile, BWSR, DWG Coordinator

The following is a synopsis of discussion topics at the recent Drainage Work Group meetings and anticipated dates for future meetings. This year's meetings are being done primarily through a hybrid format.

Recent virtual DWG meetings:

September 8, 2022.

DWG membership and decision making.

Gile presented the DWG decision making process which was adopted by the DWG membership in 2018. This document was developed to lay out the purpose, typical membership structure, general working process and decision-making process at the DWG. With some turnover in the past years as well as discussions around the early coordination framework this refresher was timely for general understanding purposes.

Discussion of "Needs justification" in support of Early Coordination improvement

As requested, Ted Suss provided a written assessment of what the intention behind the framework of the Registry bill was meant to address. This has been provided to the members and we will spend some time reviewing what was put forth and set the stage for next steps.

Some discussion still occurred around the inclusion of repairs; however it is clear from the document that the proponents are willing to have some discussion around repairs and made clear smaller "everyday repairs" (Though we all discussed there isn't a definition to separate large repairs from small) are not in the intended scope and they are willing to discuss further.

Discussion on Items needed to support Drainage Projects.

This topic has been touched on with a few other discussions and through conversations with various members there seems to be interest in trying to put in motion some efforts to clarify the documentation to support drainage projects.

This can be of value for a few of the following reasons

- Outlet adequacy discussions
- This can be of value for DNR assessments
- BWSR Grant eligibility (Now and future)
- Environmental considerations.
- Creating some form of "Regulatory certainty" for Drainage Authority.

There seems to be openness to this dialogue however the details of various individual aspects is likely to be very complex. I expect more details and discussion to come.

Next DWG meeting:

- October 13th. Hopefully a hybrid meeting with in-person and virtual options.

BOARD OF WATER AND SOIL RESOURCES

BOARD MEETING AGENDA ITEM

AGENDA ITEM TITLE: **2023 Proposed BWSR Board Meeting Schedule**

Meeting Date: September 28, 2022

Agenda Category: ☐ Committee Recommendation ☒ New Business ☐ Old Business

Item Type: ☒ Decision ☐ Discussion ☐ Information

Section/Region:

Contact: Rachel Mueller

Prepared by: Rachel Mueller

Reviewed by: John Jaschke Committee(s)

Presented by: John Jaschke/Rachel Mueller

Time requested: 5 minutes

☐ **Audio/Visual Equipment Needed for Agenda Item Presentation**

Attachments: ☐ Resolution ☐ Order ☐ Map ☒ Other Supporting Information

Fiscal/Policy Impact

☒ None
☐ Amended Policy Requested
☐ New Policy Requested
☐ Other:

☐ General Fund Budget
☐ Capital Budget
☐ Outdoor Heritage Fund Budget
☐ Clean Water Fund Budget

ACTION REQUESTED

Approve the 2023 board meeting dates.

LINKS TO ADDITIONAL INFORMATION

SUMMARY (*Consider: history, reason for consideration now, alternatives evaluated, basis for recommendation*)

Meeting dates are being proposed for board meetings in 2023. Most meetings are the fourth Wednesday of the month, unless otherwise noted. The proposed calendar has meetings held in the same months as the 2022 calendar.

BOARD OF WATER AND SOIL RESOURCES

Board Resolution # _____

Board of Water and Soil Resources

Proposed 2023 meeting dates

January 25

February – no meeting

March 22

April 26

May 24

June 28

July – no meeting

August 23-24 (Wed-Thurs) – Tour and meeting

September 27

October 25

November – no meeting

December 14 (second Thursday)

_____ Date: _____

Gerald Van Amburg, Chair
Board of Water and Soil Resources

BOARD OF WATER AND SOIL RESOURCES

Climate Change Trends and Action Plan

September 2022

BOARD OF WATER AND SOIL RESOURCES

This updated report was developed by BWSR Senior Ecologist and Vegetation Specialist Dan Shaw and Special Projects Coordinator Suzanne Rhees.

Previous publishing dates/updates:

January 2013

December 2016

September 2019

BWSR is reducing printing and mailing costs by distributing reports and information online to wider audiences. This report is available on BWSR's website under Landscape Resiliency and Climate Change and is available in alternative formats upon request.

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Executive Summary

The Minnesota Board of Water and Soil Resources' (BWSR) mission is to improve and protect Minnesota's water and soil resources by working in partnership with local organizations and private landowners. As climate change increasingly affects Minnesota's communities, landscapes, economy and ecosystems, it affects BWSR's ability to fulfill this mission.

The purposes of this report are:

- to identify the impacts of climate change on Minnesota's water and soil resources and on BWSR's mission and programs;
- to identify the benefits that conservation programs and practices provide, both in mitigating and adapting to climate change; and
- to identify action steps that BWSR can take to increase programs' effectiveness, both in mitigating the effects of climate change and increasing the resilience of Minnesota's landscapes and communities.

Over the past several years, the Walz administration's focus on climate and related state agencies' efforts have increased significantly. This report recognizes the work of the Climate Subcabinet and its member agencies, and how BWSR's efforts fit into this broader context.

Many of the conservation programs BWSR administers, while primarily designed to protect and improve water quality and soil health, also offer many complementary climate-related benefits. These benefits include both *mitigation* of the effects of climate change and *adaptation* to those effects.

Mitigation: A human intervention to reduce emissions or enhance the removal of a greenhouse gas from the atmosphere (e.g., through carbon sequestration in plants).

Adaptation: Taking action to prepare for and adjust to both the current and projected impacts from climate change. For natural systems, humans may intervene to help adjustment.

Resiliency:
The ability of communities and landscapes to adapt to a changing climate, and specifically to extreme weather events and other stressors.

Mitigation: Soil and water conservation programs mitigate the effects of climate change by storing carbon in the soil and in biomass (perennial vegetation) and by reducing the quantities of fertilizers, fuel, and other inputs needed for agriculture.

BWSR's soil and water conservation programs mitigate the effects of climate change by storing carbon in the soil and by reducing the quantities of fertilizers, fuel, and other inputs needed for agriculture. This report estimates the reductions in greenhouse gas emissions that result from conservation practices such as nutrient management, cover crops, reduced tillage, filter strips and riparian buffers.

Adaptation and Resiliency: The same soil and water conservation programs that contribute to mitigation also increase resiliency by reducing runoff and nutrient loss, reducing erosion and flooding, and maintaining agricultural productivity. Programs that promote integrated water resources management, adaptive landscape management, and multipurpose drainage management all increase resiliency.

Table 1. Summary: Climate-related Benefits of BWSR Programs

Program	Climate-related benefits
Grant and Cost-Share Programs	Promote and support agricultural best management practices (BMPs) that enhance carbon sequestration, reduce fuel and fertilizer use and manage extreme precipitation.
Local Water Management Planning / One Watershed One Plan	Watershed management plans increase landscape resilience through strategies that increase soil health, provide water storage, and protect/restore surface and ground water. Most plans include goals and strategies related to climate change.
Conservation Easement Programs (CREP and RIM)	Enhance carbon sequestration and increase the resiliency of plants, animals and landscapes through creation and restoration of natural habitat on marginal cropland, shorelands and woodlands.
Wetland Restoration and Wetland Banking	Avoid wetland losses and maintain wetland functions, with potential reductions in CO_2 emissions from wetland drainage.
Pollinator and Habitat Programs	Enhance carbon sequestration through creation and restoration of natural habitat and renewable energy production; increase the resiliency of landscapes and wildlife populations.

Action steps to guide future direction

BWSR will increase the focus of its conservation programs on mitigating and adapting to the effects of climate change, and may develop new policies and programs where needed. Priority initiatives in 2022-2023 include:

- Incorporate **soil health** as a primary consideration, along with water quality, when monitoring and assessing the benefits of conservation practices.
- Emphasize the benefits of **water storage practices** that protect infrastructure, improve water quality and related public benefits, and mitigate climate change impacts.
- Expand easement offerings to include a range of **working land and floodplain easements** that allow complementary uses such as haying and grazing while incorporating flood resilience and other ecosystem benefits.

- Develop more comprehensive and accurate methods to track the climate impacts of **wetland conservation and wetland replacement** throughout Minnesota.
- Support **pollinators and other beneficial insects** that create the foundation for resilient landscapes and are at risk due to climate change.
- Incorporate climate mitigation and adaptation principles into **forest management and reforestation programs** that serve private landowners and land managers.

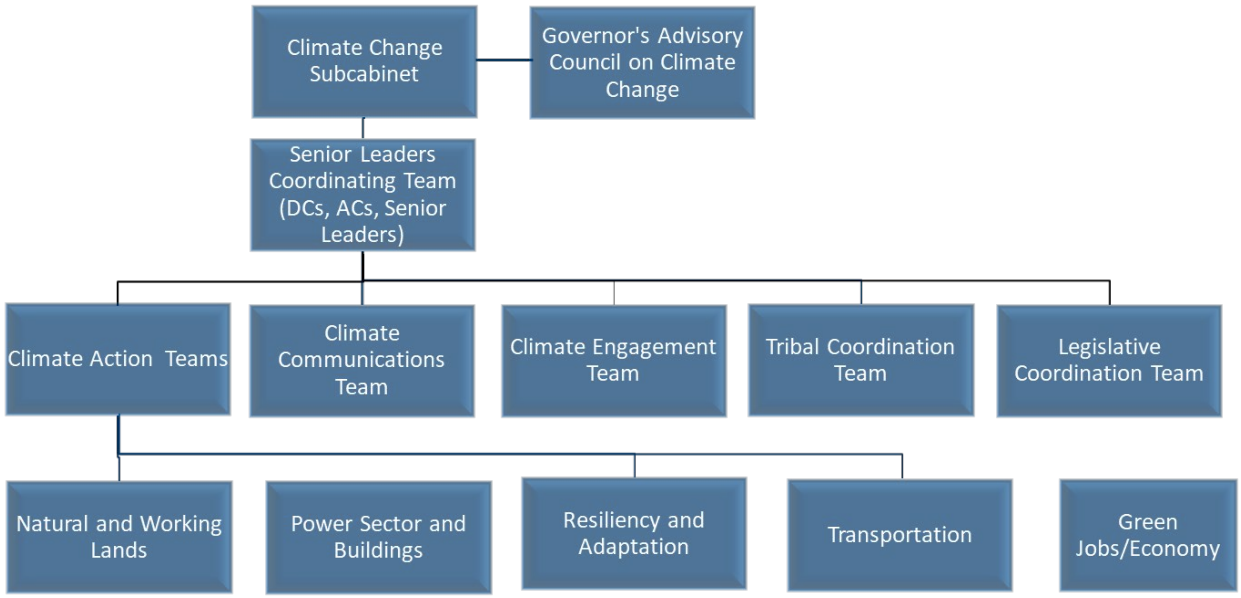
A complete list of action steps is found in Section IV.

I. Context: Minnesota's climate change efforts, 2019 - 2022

As the impacts of climate change are increasingly apparent in Minnesota, the Walz administration and state agencies have responded. On December 2, 2019, Governor Walz signed Executive Order 19-37, directing state agencies to engage communities and identify policies to reduce emissions and build resiliency. The Executive Order emphasized Minnesota's failure to meet the statutory goals of the 2007 Next Generation Energy Act: to reduce GHG emissions by 30% by 2025 and 80% by 2050.

The Executive Order established a Climate Change Subcabinet and a Governor's Advisory Council on Climate Change, with the goal of promoting coordinated climate change mitigation and resilience strategies. The Subcabinet is comprised of executives from 15 state agencies, departments, and boards, and is organized into five action teams. BWSR leadership and staff are directly involved with the **Natural and Working Lands, Climate Communicators**, and **Resiliency and Adaptation** Teams.

The Advisory Council is comprised of up to 15 members appointed by the Governor and includes civic and community leaders with experience in business, agriculture, conservation, environmental protection, and other relevant fields.



The Subcabinet and Advisory Council led the development of Minnesota's Climate Action Framework, released in September 2022. The Framework adopts new climate goals based on the best available science from the Intergovernmental Panel on Climate Change (IPCC). These include reducing our greenhouse gas emissions by 50% by 2030, achieving net-zero emissions by 2050, and prioritizing investments in climate resilience over the next 10 years. Natural and working lands – the farms, forests, and grasslands that stretch across our state – are an important part of Minnesota's climate solutions. Agricultural and forestry practices that improve water quality and soil health can also strengthen rural economies, protect natural environments, and help our farmers and forest landowners.

Legislative Initiatives

The Minnesota Legislature has also responded to climate change trends, with directives and funding for new initiatives to increase community resilience, protect infrastructure, and manage the impacts of extreme precipitation. Recent climate-related funding directed to BWSR includes:

- Funding through both the Clean Water Fund and General Fund for cover crops and soil health practices;
- Funding for a demonstration water storage and treatment program;
- Funding for Phase 2 of the Lawns to Legumes pollinator program and other pollinator protection efforts.

Interagency and Partner Efforts

The Climate Subcabinet teams created several interagency workgroups on specific initiatives and tasks. BWSR staff have participated in workgroups focused on greenhouse gas emissions tracking, water storage, carbon markets and credits, and funding and policy opportunities. These efforts have helped to inform the latest iteration of this plan.

BWSR also works closely with external partners on climate initiatives, including the U.S. Climate Alliance's Natural and Working Lands Working Group, federal agencies such as the U.S. Department of Agriculture, local and regional governments, and non-governmental organizations.

II. Climate Change Trends and Impacts

Many of the effects of climate change are already obvious, while others are less visible but are already affecting Minnesota's natural and working lands. Among the most visible:

- **Warming temperatures.** Temperatures in Minnesota have risen more than 2.5°F since the beginning of the 20th century. Since 1998, Minnesota has experienced eight of its 10 warmest years on record. This warming has been concentrated in the winter and at night, while summers have not warmed as much.
- **Increased precipitation.** Heavy rains are more common and more intense than at any time on record. Spring precipitation is projected to increase by about 15% to 20% by midcentury.
- **Extreme precipitation.** Since 2000, the number of very heavy rains (6 inches or more in a day) has been 2 to 3 times higher than in the 20th century. Extreme precipitation events are

projected to increase in frequency and intensity, resulting in increased flooding and associated impacts, such as increased erosion, infrastructure damage, and agricultural losses.[1]

Since the 2019 update of this plan, much more extensive research is now available regarding Minnesota's climate and how it is changing. Here are several highly informative and up-to-date state-level online sources:

- Minnesota Climate Trends (DNR) includes downloadable data on historical temperature and precipitation trends and an overview of the most significant trends.
- Our Minnesota Climate provides a broad overview of trends, local impacts, state actions and community solutions.

Effects of Climate Change on Soil and Water Resources

Climate change and related extreme weather events are impacting the quality of soil and water resources across Minnesota:

- More frequent, heavier, or longer-duration rainfall events increase **soil erosion and runoff**, thereby degrading water quality through deposition of sediment and contaminants in water bodies.
- Intense rainfall events are impacting Minnesota agriculture, resulting in **increased runoff of fertilizers, pesticides, and sediment**, particularly from agricultural fields that do not have best management practice, (such as buffers, grassed waterways, and crop residue left on the fields) in place. Field flooding and crop failure can result. Costs of disaster assistance will likely continue to increase.

Flood damage in Scott County (above) and Rock County, (below) 2014

- Greater precipitation increases **challenges for applying manure** in an environmentally safe manner to fields. Flooding can also cause **overflow of manure storage basins** which have inadequate storage capacity, leading to contamination of nearby water bodies and death of aquatic organisms.
- Extreme weather events put additional pressure on the state's **drainage infrastructure**. There is a potential for more erosion within older drainage

[1] Key messages drawn from Minnesota Climate Trends (DNR) and NOAA 2022 State Climate Summary for Minnesota, https://statesummaries.ncics.org/chapter/mn/

systems that do not have adequate outlets or erosion controls in place.

- Flooding from extreme precipitation can **damage the built environment**, affecting commercial and residential buildings, roads, parks, and stormwater infrastructure. Water-saturated soils can destabilize bluffs, trees, and utility poles. Costs of disaster assistance will likely continue to increase.

- Changes in amount, frequency, and intensity of precipitation can impact **stormwater management,** potentially exceeding the design capacity of stormwater treatment structures or impacting future structure design. Extreme weather also adds to challenges in monitoring water quality.

- Combinations of extreme storms, flooding, harmful insects, and invasive species will further degrade **natural wetlands, prairies and forests**.

- **Northern forests** could significantly change in structure from the spread of the emerald ash borer and woody invasive species such as common and glossy buckthorn and invasive honeysuckles. Some areas are expected to transition from coniferous forest to savanna as the climate warms.

- **Wetland health** has been impacted due to more frequent extreme water fluctuations and prolonged inundation of vegetation that favors invasive species and disrupts the life cycle of aquatic organisms.

Flood damage at Hokah dam, Houston County, 2018

Climate change also affects different regions and populations disproportionately. Lower income communities and communities of color often have limited access to land and natural areas and fewer financial resources to cope with flooding and other climate change impacts. Tribal communities are threatened by decreasing opportunities to hunt, fish, and harvest natural resources from ceded lands and waters under established treaty rights. Farm families and rural communities are also particularly vulnerable to the financial and emotional stresses that result from damages to land and equipment. Finally, both for urban and rural communities, climate change can put community cohesion, relationships, and resiliency at risk.

III. BWSR's Role in Climate Action

Mitigation

Soil and water conservation programs can mitigate the effects of climate change through carbon sequestration and emission reduction.

Soils contain vast quantities of carbon — more than double the amount in the atmosphere. Carbon levels in soil vary depending on climate, soil parent material, vegetation type, landscape position, and human activities. Healthy soil holds the carbon that plants absorb from the air and incorporate into their root systems. Carbon is stored in the soil as roots, root exudates, and decomposed plant matter. Repeated plowing and chemical fertilizer use can reduce soil carbon, as well as soil fertility and water-holding capacity.

The same practices that are known to improve soil health and water quality can also increase carbon sequestration. These include conservation practices that keep soil covered year-round, such as cover crops, reduced tillage, or perennial vegetation, thereby reinvigorating soil biology and increasing carbon sequestration. Conservation practices can also reduce the quantities of fertilizers, fuel, and other inputs needed for agriculture, thus reducing greenhouse gas emissions while reducing costs.

Definitions

Carbon sequestration (biological): The process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in **biomass** (trunks, branches, foliage, and roots) and soils.

Greenhouse gases (GHGs): Gases in the Earth's atmosphere that trap heat. Carbon dioxide is the primary greenhouse gas emitted through human activities such as burning fossil fuels. Nitrous oxide and methane are also important greenhouse gases.

GHG emission reduction: Greenhouse gas emissions can be reduced both through carbon sequestration, which offsets a portion of the emissions, and through reduction in emission-producing activities such as fertilizer use and fossil fuel consumption associated with agricultural production. GHG emission reduction is expressed in this report in metric tons of carbon dioxide equivalent (see Appendix A) for details.

While these benefits can be significant, there are also significant uncertainties and challenges in assessing and verifying them. Carbon sequestration in soils is highly variable, depending on multiple factors such as soil type, weather patterns, root growth and depth, tillage, and fertilization (Gutknecht and Jungers, 2021). Furthermore, carbon stored in soils can quickly dissipate if those soils are later tilled, making duration of soil health practices key in achieving substantial benefits.

While recognizing these uncertainties, BWSR staff have worked with other agencies since 2019 to track and estimate the GHG reductions achieved through the programs that the agency funds, manages, or oversees. To date, we can estimate these results in two program areas:

- **Conservation easement practices:** Since the Reinvest in Minnesota program began in 1987, almost 290,000 acres of land, much of it marginal farmland, have been restored to grasslands, wetlands, or forestland (or CRP conversion to agriculture has been prevented) through easement programs. Conservation easements that establish native vegetation, restore wetlands, plant trees and shrubs or improve forest management can achieve substantial carbon sequestration. Reduction of nitrous oxide and carbon dioxide entering the atmosphere from

fertilization, fertilizer production, and consumption of fossil fuels for farming marginal agricultural fields also contribute to total emission reductions.

Since easements are permanent (although practices and land management may change), there is a higher degree of confidence in the carbon sequestration benefits they provide. While not all easements incorporate conservation practices, and the database of conservation practices is incomplete, practices can be tracked on **204,395 acres as of 2020,** and are estimated to have reduced GHG emission reductions by **about 350,061 metric tons CO_2e per year** (CO_2e is a measure that combines emissions from a "bundle" of GHGs, including carbon dioxide, methane, nitrous oxide and ozone based on their relative global warming potential).

- **Grant and cost-share practices:** Conservation practices are tracked in BWSR's eLINK conservation tracking system. The most widely implemented practices include conversion of cropland to grassland, installation of riparian buffers, field borders and filter strips, reduced tillage, and improved fertilizer management. As discussed above, there is a high degree of uncertainty as to the amount and permanence of carbon sequestration benefits. However, several agencies have used emission-reduction factors developed by MPCA (Ciborowski, 2019) to develop initial estimates of the results of conservation practices funded through state and federal programs. Through 2021, conservation practices funded through BWSR's grant and cost-share programs and documented in eLINK have been implemented across **618,839 acres** and are estimated to reduce greenhouse gas emissions by about **432,000 metric tons CO_2e per year**.

Cover crops, Jackson County

Other restoration efforts can be more difficult to assess. Restoration of high quality, diverse, and resilient wetlands to replace wetland losses can mitigate the increased emissions that result from conversion of wetlands to agriculture or urban development. Evidence suggests more carbon is sequestered by a richer mix of native species (such mixed forests) and that such communities are more stable over time. It is not currently feasible to quantify these mitigation benefits, because we lack sufficient data on the characteristics of wetlands lost to development compared to the wetlands that replace them. However, typical replacement ratios of 2.5 or 1.5 to 1 (acres of replacement

Wetland restoration in Wright County

wetland to acres of impacted wetland) can result in increased wetland acreage, which would be beneficial to track and quantify.

See **Appendix A** for a detailed analysis of estimated carbon sequestration and GHG reduction benefits from conservation practices through BWSR programs.

Adaptation and Resiliency:

Conservation programs can assist local partners, communities, and individual landowners in adapting to our changing climate. The ability to adapt is a hallmark of a resilient landscape as well as more resilient and durable infrastructure.

- **Agricultural conservation practices.** BWSR promotes conservation practices in agricultural areas that promote soil health and the ability of soils to capture and store rainfall, store carbon and decrease heat absorption from tilled ground. Most "ag BMPs" are designed to improve water quality, but can also minimize impacts from extreme precipitation as well as periods of water scarcity. Such practices include cover crops, field terraces, no-till farming, riparian buffers, retention areas, and restored or constructed wetlands.

Participants in the Increasing Diversity in Environmental Careers (IDEC) mentorship program view soil and seed samples

- **Forestry protection and restoration practices.** BWSR is becoming increasingly active in working with local partners and the DNR in the management of privately-owned forestland, working with SWCDs by offering training, information, and technical assistance on forestry and agroforestry issues. County-level programs are aligned with work being done by the DNR, using easements and other conservation practices to protect wildlife and water quality. Forest management practices such as reforestation, stand thinning, wildlife habitat enhancement and erosion control can increase forest health and resilience. Healthy forests are more resilient to threats such as wildfire, insect and disease outbreaks, invasive species, flooding, and other problems exacerbated by climate change.

- **Watershed planning.** BWSR supports and promotes integrated water resources management at a variety of watershed scales, either developed under the One Watershed, One Plan (1W1P) program or through other planning efforts by watershed districts, watershed management organizations or other basin-wide partnerships, with the primary goal of improving water quality. Plans incorporate multiple complementary goals and strategies to improve soil health, create or restore wetlands, improve forest and grassland habitat, increase water storage for flood control and resource protection, protect drinking water, and improve stormwater management. Climate change is referred to as an "emerging issue" in BWSR's guidance to 1W1P participants. While most comprehensive watershed management plans incorporate

resilience-oriented goals and strategies, less than half include goals and actions explicitly designed to address the topic of climate change (MS-STEP Capstone Paper, 2022).

- **Conservation easements.** By converting marginal agricultural land from row crops or pasture to forest, wetlands, or native grasslands, easement conservation practices build resilience to extreme weather events, including flooding and drought periods, as well as to threats such as wildfire, insect and disease outbreaks, and habitat loss.

- **Wetlands and upland buffers.** The ecosystem services provided by wetlands also protect against intense storm events and periods of drought. Associated upland buffers protect wetland ecosystems and provide landscape connectivity and other functions that promote landscape resiliency. Restoration projects also increase infiltration rates and store water on the landscape. BWSR has developed technical resources to help practitioners restore diverse and resilient landscapes, such as the Minnesota Wetland Restoration Guide, State Seed Mixes and Native Vegetation Establishment and Enhancement Guidelines. Riparian buffers installed under the Buffer Law (Minn. Stats. 103F.48) must include perennial cover, which also help to hold water on the land and can increase wildlife habitat (depending on the vegetation used).

- **Water management and green infrastructure.** Water volumes across Minnesota have been increasing as a result of climate change, in turn increasing flooding, erosion, and infrastructure damage. Clean Water Fund grants administered by BWSR play a key role in planning and implementing water management projects, including urban green infrastructure projects that manage water volumes and improve water quality. BWSR staff also provide technical assistance and resources for green infrastructure projects.

- **Pollinator and habitat enhancement programs.** The decline of wildlife populations, including beneficial insects (pollinators, butterflies, dragonflies, etc.), birds, amphibians and other species, is a significant concern in Minnesota. These species provide a foundation for food production, food webs and native ecosystems. Their loss results from a variety of factors including habitat loss, invasive species, pesticides, climate change, and diseases. BWSR's pollinator and habitat enhancement programs, termed the "Living Landscape Initiative," assist local partners in establishing targeted, high diversity pollinator and beneficial habitat on conservation lands and natural areas.

Table 2 summarizes the ways in which BWSR's primary grant, easement and planning programs contribute to climate mitigation and support climate adaptation/increase resiliency. The primary objective of each program is noted, recognizing that climate benefits, while significant, are usually secondary to that objective.

Table 2. Summary of BWSR Program Relationships to Climate Concerns

Program and Primary Objective	Program Objective	Mitigation	Adaptation and Improved Resiliency
Clean Water Fund Grants: Projects and Practices, including Drinking Water	To protect, enhance, and restore water quality in lakes, rivers, and streams and protect groundwater and drinking water sources from degradation.	Many funded non-structural practices sequester carbon and reduce inputs. Achieving long-term mitigation depends on duration of practices.	Most practices improve adaptation to extreme precipitation; prevent flood damages, erosion and soil loss.
Clean Water Fund Grants: Multipurpose Drainage Management	Targeting critical pollution source areas to reduce erosion and sedimenta-tion, reduce peak flows and flooding, and improve water quality, while protecting drainage system efficiency and reducing maintenance for priority Chapter 103E drainage systems.	Likely not significant, although storage and treatment wetlands may provide some degree of carbon sequestration.	Practices that keep drainage systems functioning efficiently can also increase resiliency to flood damage, erosion and sedimentation.
Erosion Control and Water Management (State Cost-share)	To share the cost of conservation practices for high priority erosion, sedimentation, or water quality problems, or water quantity problems due to altered hydrology.	Many funded nonstructural practices can sequester carbon and reduce emissions of GHGs. Achieving long-term mitigation depends on duration of practices.	Nonstructural practices such as cover crops, residue management, and nutrient management all contribute to resiliency of agricultural operations to extreme precipitation and soil loss.
Local Water Management Planning / One Watershed One Plan	Support a planning process to improve water quality with a focus on prioritized, targeted, and measurable implementation of restoration and protection activities	Varies depending on specific plan strategies	Most plans increase landscape resilience through strategies that keep water on the land, build soil health, and protect or restore key natural resources. Goals and strategies for climate adaptation and resilience are incorporated in a majority of plans.
Conservation Easement Programs (CREP and RIM)	Enhance habitat for wildlife, non-game species and pollinators through conversion of riparian areas and marginal cropland to native grasses, woodland or wetland, improve water quality and reduce nitrate loading in drinking water supplies	Easement permanence supports long-term carbon sequestration	Easement practices increase landscape resilience to flooding, drought, invasive species and other threats.

Program and Primary Objective	Program Objective	Mitigation	Adaptation and Improved Resiliency
Wetland Restoration and Wetland Banking	Achieve no net loss of quantity, quality and diversity of existing wetlands	Bank projects that restore/rewet peatlands can significantly reduce GHG emissions; more research needed to compare replacement wetlands to those lost to development	Wetland restoration and creation
Water Storage Pilot Program	Per legislation, "to provide financial assistance to local units of government to control water volume and rates to protect infrastructure, improve water quality and related public benefits, and mitigate climate change impacts"	Effects on GHG emissions are unknown; more research needed	Water storage will increase resiliency to extreme precipitation and other effects of altered hydrology.
Soil Health Pilot Programs	Clean Water Fund: Improve water quality through targeted soil health practices, focusing on public water supplies. General Fund: Increase carbon sequestration.	Soil health practices can increase carbon sequestration if maintained for sufficient amounts of time.	Improving soil health helps to hold water, improving resiliency to flooding and erosion.
Pollinator and Habitat Programs: • **Lawns to Legumes** • **Habitat Enhancement Landscape Pilot** • **Habitat-Friendly Solar**	To assist local partners in establishing targeted, high diversity pollinator and beneficial habitat on conservation lands and natural areas.	Pollinator habitat that includes deep-rooted native plants is likely to increase carbon sequestration; more research needed.	Restoration of native landscapes increases resilience to flooding, drought, invasive species, habitat fragmentation, pesticides and other threats.

IV. Priority Action Steps

This section summarizes key work categories that BWSR plans to pursue to advance climate adaptation and mitigation benefits. Action steps are classified by program or topic area and identified as "policy" or "program" related.

Grant and Cost-Share Programs

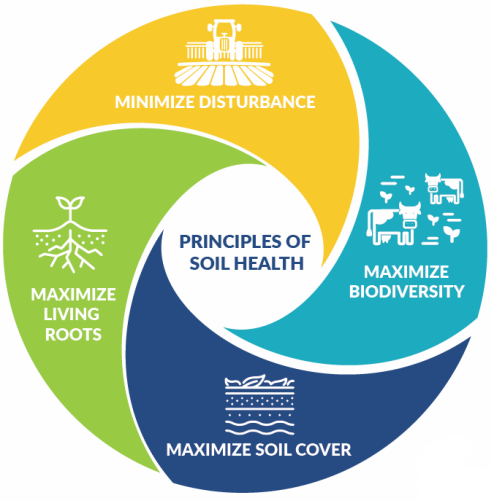
Policy Actions

Establish standards under which **harvestable perennial and cover crops** such as alfalfa, Kernza and winter camelina may be eligible for grants and cost-share funding. These crops are generally non-native and potentially marketable, but can also play key roles in improving soil health and protecting public and private drinking water supplies. This effort is part of the update of BWSR's *Native Vegetation Management and Enhancement Guidelines*.

Incorporate a greater focus on **non-forest tree-planting efforts**, including shelterbelts, buffers and windbreaks, under **cost-share program standards**. These practices were discouraged under previous statutes, but those limitations have since been lifted (Minn. Statutes §103C.501, subd. 6(b)) and there is renewed interest in planting trees in agricultural regions for both energy conservation and carbon sequestration. Encourage diverse tree species that are adaptable to future conditions.

Link **multipurpose drainage** programs and policies to emerging water storage initiatives (discussed below). Altered hydrology, including higher peak flows, add stresses to public drainage systems. BWSR will continue to develop and refine standards for drainage management practices that foster climate adaptation and improve resilience to flooding, erosion, and habitat loss. Addition of water storage within drainage systems can reduce the need for system expansion or repair.

Incorporate **soil health** as a consideration when monitoring and assessing the benefits of conservation practices. "Soil health" is shorthand for a systematic approach to managing soil based on specific principles (see sidebar). BWSR is working with the Minnesota Office for Soil Health (MOSH), a collaborative partnership of BWSR and the University of Minnesota, on a strategic planning effort to **scale up adoption of soil health management practices** that mitigate the impacts of climate change and increase landscape resiliency. This initiative, along with the new programs noted below, will improve our ability to promote and assess soil health, similar to the "prioritize, target and measure" approach to watershed health.



Principles of soil health, NRCS graphic

New Programs

In 2021, BWSR received new appropriations and authorities to partner with local government and landowners to implement additional actions to sequester carbon and adapt to our changing climate. These new initiatives are directed at accelerating the adoption of cover crops, soil health practices and water storage and treatment projects. BWSR staff will assess the results of

these pilot programs and the impacts of proposed projects on climate mitigation and landscape resilience.

- The **Water Quality and Storage Pilot Program** was initiated in 2022 to provide financial assistance to local governments to control water rates and/or volumes to protect infrastructure, improve water quality and related public benefits, and mitigate climate change impacts. This program has been established as a pilot that will fund design and construction of storage projects and practices, with priority given to applicants in the Minnesota River Basin or Lower Mississippi River Basin. Three grants were awarded in 2022 for projects in Lyon and Le Sueur counties. Program expansion may be feasible if additional funding becomes available, and both local governments and watershed planning partners need better information on water storage options.

- Several **Soil Health Pilot Grant Programs** are available in 2022, using funds received in the 2021 legislative session. BWSR received funding to implement two soil health initiatives, one through the Clean Water Fund to enhance adoption of cover crops and other soil health practices in areas where there are direct benefits to public water supplies and a second (noncompetitive) cost-share program through the General Fund with a focus on practices that promote carbon sequestration.

Easement Programs

Policy Actions

Incorporate **climate mitigation and adaptation benefits** as criteria when evaluating and prioritizing potential easements.

Program Actions

Implement and monitor progress of **working lands and floodplain easement programs** that incorporate haying/grazing, silviculture, and similar practices to increase landscape resilience while allowing economic use. Staff will assess continued development and successful implementation of programs and discuss how economic uses influence payment structures.

New Programs

The purpose of the **Working Lands RIM Easement** pilot program is to protect and promote perennial vegetation land cover for the benefit of surface and groundwater through "working lands" easements, defined as lands that are used for haying or grazing. This program is focused on the Pine, Crow Wing and Redeye River watersheds, all priority source water protection areas in Minnesota. Tracking the implementation of this program will help us account for the role of perennial haying and grazing lands in carbon sequestration as well as source water protection.

Rattlesnake master and other native plants on RIM parcel, Rice County

Other innovative easement offerings are under discussion. **RIM Floodplain Easements** are being developed as of 2022. These easements are designed to set aside sensitive land in river riparian corridors to address water quality concerns and meet climate adaptation and mitigation goals. Participating landowners will have options to establish flood-hardy understory, establish trees, haying/grazing, silviculture, silvopasture and agroforestry, with payment structures based on the proposed uses.

RIM Wetland Restoration Easements in the Prairie Pothole Region are also in the planning stages, funded through the Outdoor Heritage Fund. As discussed under "Peatlands Initiatives," carbon sequestration and climate mitigation factors should be considered when reviewing and ranking easement applications for wetland restoration.

Forestry Initiatives and Programs

Forestry initiatives cut across several other program sectors, including Grants, Watershed Planning, and Easement programs, but are highlighted separately because of their increasing importance for both mitigation and adaptation.

Policy Actions

Incorporate climate mitigation and adaptation into forest management programs and policies. Focus on supporting private forest management practices (including forest stand improvement, timber harvesting, forest health, invasive species, wildfire suppression and fuel load management, tourism and recreation activities, etc.) that improve carbon sequestration and assist with adaptation to climate change.

Program Actions

Further incorporate climate mitigation and adaptation into **Landscape Stewardship Plans (LSP).** Landscape stewardship is an "all lands" approach to forest management, created by the US Forest Service and based on five working principles: 1) Invest in priority areas, 2) Build a collaborative network of service providers that effectively work together to serve more landowners, 3) Appeal to interests of both landowner and service providers, 4) Manage for results, and 5) Encourage flexibility at all levels to be more adaptive and cooperative in serving customers. LSPs have been developed for five watersheds as of 2021.

To date, LSPs have prioritized water quality protection and improvement, using the percentage of forest cover in each subwatershed as an indicator of watershed health (75% forest cover is generally considered a benchmark for a healthy forested watershed). As LSPs are developed for additional watersheds, they could be enhanced by identifying the importance of forest cover for carbon sequestration, and examining the mix of tree species from an adaptation perspective. The "Climate Change Field Guide for Northern Minnesota Forests," from the USDA, UMN and Northern Forests Climate Hub should be used for site-level adaptation considerations. Another helpful resource is the East Central Landscape Plan (2021) from the Minnesota Forest Resources Council.

Support a **large-scale reforestation initiative** focused on planting 1 million acres of trees over 20 years, focusing on previously forested regions of Minnesota. The Nature Conservancy (TNC) has led this "Minnesota Million" effort, working with multiple stakeholders. TNC has identified about three million

acres with reforestation potential, largely in the Midwest Broadleaf Forest province and adjacent areas to the north. This effort will include supporting partner efforts to accelerate production of tree seedlings. Incorporating reforestation opportunities into watershed plans and enlisting SWCDs and watershed districts will be critical in advancing this initiative.

Practice/Implementation Actions

- Encourage local governments to use Watershed-Based Implementation Funding program dollars and other funding sources to increase local capacity to implement LSP goals in comprehensive watershed management plans, working with local forestry technical teams.
- Increase cost-share funding for reforestation, complementing LSP/DNR efforts and adding SWCD capacity where it's lacking.
- Promote forest management practices such as lengthened rotations, forest thinning, prescribed burning and sustainable harvest practices that can increase the landscape's ability to store carbon. More research is needed on the effects of specific practices on carbon sequestration.

Watershed and Water Planning Programs

Policy and Program Actions

One Watershed One Plan (1W1P): Expand and strengthen the climate-related technical and policy guidance provided to 1W1P participants developing comprehensive watershed management plans (CWMPs) and other plans for which BWSR provides oversight. A comprehensive analysis prepared by a Humphrey School of Public Affairs graduate student team (MS-STEP Capstone Paper, 2022) makes several recommendations for improving the 1W1P program's technical resources, and public engagement to foster climate resilient CWMPs, including:

- Promotion of watershed-specific predictive modeling to complement the NOAA Atlas 14 (the current design standard for infrastructure engineering) (see Noe et al, 2019)
- Identification of best practices for climate resilience and funding directed specifically toward resilience measures
- Improved consultant and public engagement around climate issues, while recognizing that the term "climate change" remains polarizing and divisive in many areas

BWSR's Water Planning Team will review these and other recommendations over the coming months and determine how to develop specific guidance on climate change issues and responses for watershed planning participants (e.g., add a climate change/resilience chapter to the 1W1P guidebook; update planning guidance in BWSR's Climate Resilience Toolbox).

An additional challenge is that climate-related initiatives in plans may appear to be less measurable than reductions in pollutants such as phosphorus. The MPCA has developed metrics to identify the greenhouse gas reductions achievable through soil health and forest management practices, though additional discussion is needed about how to effectively measure the outcomes of climate adaptation and resiliency efforts. BWSR staff will share available metrics with local partners and will explore the potential to integrate these metrics into the next generation eLINK system.

Landscape Ecology, Restoration and Resiliency Programs

Policy and Program Actions

Update BWSR's *Native Vegetation Establishment and Enhancement Guidelines* regarding plant selection, establishment and management considerations to maximize climate adaptation and mitigation and to address the impacts of increased invasive species pressure and extreme precipitation. The Guidelines were updated in 2022 to a web-based format with factsheets providing guidance on a broad range of project types. Factsheets will be updated periodically to incorporate new information on landscape resiliency and habitat enhancement.

Though BWSR's **Living Landscapes Initiative**, increase focus on maximizing benefits to all wildlife and native plant populations through all BWSR conservation programs. The decline of wildlife populations, including beneficial insects (pollinators, butterflies, dragonflies, etc.), birds, amphibians and other species, is a significant concern, as these species provide a foundation for food production, food webs and the resiliency of native ecosystems. Their loss results from a variety of factors including habitat loss, invasive species, pesticides, climate change, and diseases. BWSR's Habitat Friendly Solar, Lawns to Legumes, Habitat Enhancement Pilot and Cooperative Weed Management Area programs play key roles in accomplishing the goals of this initiative. Key technical resources such as state seed mixes, BWSR Pollinator and Biodiversity Toolbox and What's Working for Conservation webpages are also being updated.

Adaptive management strategies play an important role in maintaining landscapes in a way that will increase landscape resiliency with the increasing threats posed by invasive species. Strategies include:

- Long-term monitoring and adaptive management of restored plant communities to control invasive species and promote plant diversity and the resiliency of forests, grasslands and wetlands.
- Promoting Cooperative Weed Management Areas (CWMAs), local organizations that provide a mechanism for sharing invasive species management expertise and resources across jurisdictional boundaries to achieve widespread invasive species prevention and control in a broader geographic region
- Increasing focus on emerging weed threats that benefit from a warming climate, such as woody invasive species that are starting to invade northern forests.

Programs

- **Lawns to Legumes**: with funding from the Environmental and Natural Resources Trust Fund (ENRTF), BWSR and nonprofit partners offer incentives and technical assistance to plant residential lawns with native vegetation and pollinator friendly forbs and legumes. Phase I of the program awarded around 850 individual grants and 12 demonstration neighborhood grants, resulting in establishment of pollinator habitat on around 1,000 projects. Phase II is increasing the number of awards to meet high demand while expanding eligibility to community and educational spaces. Additional research and tracking of planted acreage would help BWSR staff to assess the carbon sequestration benefits of pollinator habitat (likely similar to the benefits of native grassland), as we are able to do with agricultural practices.

- The **Habitat Friendly Solar Program** promotes the plantings of diverse native vegetation on solar projects. State legislation allows solar developers to claim that they are "Habitat Friendly" if they meet standards defined in BWSR's Assessment forms. These projects add habitat value as well as increased carbon sequestration on solar installations. It is estimated that about 1,000 acres of solar sites are being developed annually in Minnesota and around 50 projects currently meet standards. However, the lack of dedicated funding for this program limits the amount of time BWSR staff can devote to it. BWSR will seek funding to support habitat friendly plantings for solar installations and other utility infrastructure, such as wind energy and transmission corridors.

- The **Habitat Enhancement Landscape Pilot (HELP) Program** is a new grant program designed to improve habitat on public lands or private lands with a public investment, including existing RIM easements, CRP, city parks, county parks, and protected natural areas. Projects focus on: 1) Establishing new floral rich plots or riparian plantings 0.5 to 5 acres in size and/or 2) Enhancing prairie, savanna, wetland, and shoreline communities that provide high value habitat. Projects are being planned to benefit a variety of beneficial insects in need of habitat improvements, including at-risk species (e.g., Rusty-patched bumblebee), and other declining insect guilds (e.g., dragonflies, native bees, butterflies).

Bluff prairie restoration, Winona County

Wetland Protection and Restoration Programs

Policy and Program Actions

Develop more **comprehensive and accurate methods to track the climate impacts of wetland conservation and wetland replacement** throughout Minnesota. Wetlands, especially those with peat soils, can store large quantities of carbon, but can also emit methane and release methyl mercury into watercourses. Currently, outcomes under the Wetland Conservation Act are reported by local governments, but without any information on the quality and type of wetlands that are converted or replaced, making it impossible to assess the climate impacts of these actions. Wetlands staff are planning an online permit application and tracking system associated with the state's potential assumption of the 404 federal regulatory program. The system could be developed to track specific types or characteristics of wetland losses and gains that correlate to net GHG emission reductions or increases.

Restorable Peatland Assessments: BWSR staff, working with other agencies, the Climate Subcabinet Natural and Working Lands Team, The Nature Conservancy, and university researchers, will conduct an analysis of acres and restoration potential of restorable drained, farmed or pastured peatland soils (histosols), classified as bogs, fens, and related wetland types. These soils, rich in organic matter, emit about 11 million metric tons of carbon dioxide and nitrous oxide per year, making them the single largest source of emissions in Minnesota's "Agriculture, Forestry and Land Use" sector (MPCA GHG inventory). However, peatland soils can be restored and rewetted to again act as carbon sinks.

Minnesota has the largest acreage of peatlands in the continental U.S. As shown in Figure 1, an estimated 600,000 acres of peatland soils have been partially drained but not currently farmed, while another 300,000 – 400,000 acres are currently farmed or grazed.

BWSR has developed and is testing an interactive mapping application, drawing from soils and vegetation map layers developed by The Nature Conservancy, the Natural Resources Research Institute and other researchers, to allow users to enter an address, legal description or zoom into a project location. Information will be shown for 1) intact natural peatlands; 2) drained natural (not farmed or pastured) peatlands, and 3) drained and farmed or pastured peatlands. BWSR will also continue to work with partner agencies and organizations on policies and programs affecting peatlands, and on strategies for their preservation.

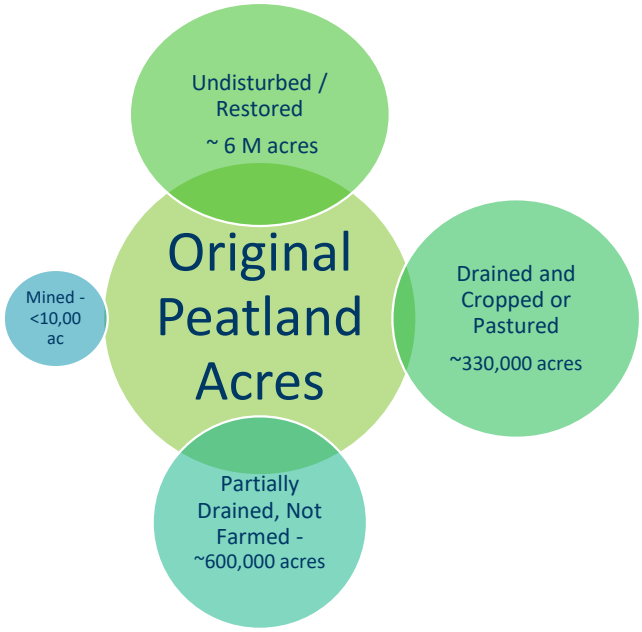


Figure 1: Estimated peatland acreage in Minnesota. Data source: The Nature Conservancy

Programs

Pitcher plants and sphagnum moss, Big Bog State Recreation Area

- **Wetland Banking**: Climate impacts of wetland banking programs could also be further recognized and prioritized among other wetland functions such as flood mitigation and habitat enhancement. Some of the largest wetland banks, such as the Lake Superior Mitigation Bank in St. Louis County, have restored thousands of acres of drained open and forested bog, enhancing important bird habitat (notably the 24,000-acre Sax-Zim Bog) while mitigating GHG emissions from these peatlands. Because wetland banks are compensatory – that is, they compensate for wetland losses through development elsewhere – it is difficult to "count" their benefits, but it is important to recognize them.
- The ongoing **Wetland Functional Assessment pilot** (a partnership of Minnesota and Wisconsin) will provide an opportunity to include GHG emission reductions as one of the "functions" being assessed for existing wetlands and help guide decision making for new wetland restoration projects.

General and Interagency Action Steps

Program Action – Explore how best to connect existing conservation programs to emerging **carbon trading markets, water quality trading markets, and other ecosystem service markets**.

Carbon markets are still in the early stages of formation, with many questions around how they are managed, their effectiveness in reducing emissions, and the verifiability and durability of the practices they support. Topics like additionality (how much improvement is being made compared to a baseline), lookback provisions (offering credit for existing practices rather than only new ones), and verification of practice implementation still require further study. Guidance for landowners, local governments, and state agencies will be needed to ensure that new carbon markets are verifiable and transparent.

Water quality trading (WQT) has been applied in Minnesota to meet water quality discharge permit requirements, managed by the MPCA. A recent pilot effort in the North Fork Crow River watershed indicated substantial interest among both buyers of water quality credits (mainly wastewater and water treatment plants) and potential credit generators (farmers and landowners). BWSR will encourage the use of WQT in connection with stormwater permitting and as a strategy in watershed plans.

Practice/Implementation Action – Explore potential collaboration with SWCDs to collect soil samples to measure soil carbon. BWSR staff will explore costs of sampling, discuss with Extension staff, and seek resources to support this effort.

Action Steps for Further Discussion

The following practice/implementation action steps are in the formative stages and will require further discussion and clarification before outcomes and timeframes are determined. New or expanded funding sources may be needed to develop some of these steps.

- **Assess the potential to track and measure the climate adaptation benefits of BWSR programs.** Many conservation practices designed to improve water quality or reduce flooding also benefit soil health and increase resilience to more extreme precipitation. However, these adaptation/resilience benefits are difficult to quantify without specific metrics. The U.S. Climate Alliance is working with states and advisors to develop resilience metrics and standards; BWSR staff will monitor this emerging topic.

- **Improve emission tracking tools for established conservation practices and emerging practices**, including establishment of perennial crops, winter annual cover crops, use of biochar, and wetland enhancement. These efforts are continuing among state agencies under the leadership of the Climate Subcabinet.

- **Assess ways to benefit at-risk and underserved populations through conservation programs**. "At-risk" populations in urban and rural communities are those with greater vulnerability to heat, flooding, disruption of water supplies, and other climate-related impacts, due to their location, lack of resources, or historical inequities. To provide equitable access to conservation program benefits, additional outreach and engagement with cities, tribal governments, and environmental justice-focused organizations will be needed.

- **Seek opportunities to recognize and incentivize climate mitigation and adaptation efforts that residents and land managers are doing on their own**, such as tree planting, pollinator plantings, rain gardens, reduced tillage, etc. (A funding source would likely be needed to develop this concept.)

- **Collaborate with partners to increase the testing of soil carbon and organic content before and after conservation projects are installed,** as well as long-term testing to increase our understanding of carbon sequestration benefits of different conservation practices.

- **Assess life-cycle costs of conservation practices** such as water storage, habitat enhancement, wetland creation, etc., and ways to reduce these costs.

References

Adamus, Paul. 2008. Mitigating Global Climate Change: Which Kinds of Wetlands Help, Hurt, or Have Minimal Effect? Presented at the Association of State Wetland Managers Annual Conference, September 2008.

American Farmland Trust. 2020. Combatting Climate Change on US Cropland: Affirming the Technical Capacity of Cover Cropping and No-Till to Sequester Carbon and Reduce Greenhouse Gas Emissions. https://s30428.pcdn.co/wp-content/uploads/2020/12/AFT_Carbon-WP-2020_FNL-web.pdf

Anderson, Jim, et al. 2008. The potential for terrestrial carbon sequestration in Minnesota. A report to the Department of Natural Resources from the Minnesota Terrestrial Carbon Sequestration Initiative. St. Paul: University of Minnesota.

Bjorhus, Jennifer. 2022. A climate conundrum beneath our feet: Minnesota's farmed peat soil releases greenhouse gases. Star Tribune, Feb. 12, 2022. https://www.startribune.com/a-climate-conundrum-beneath-our-feet-minnesotas-farmed-peat-soil-releases-greenhouse-gases/600146107/

Ciborowski, P. 2019. Greenhouse gas reduction potential of agricultural best management practices. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/air/agriculture-and-climate-change-minnesota

Fargione, J.E., et. al. 2018. Natural climate solutions for the United States. *Science Advances* 2018; 4. https://advances.sciencemag.org/content/4/11/eaat1869

Friesen, H. et. al. 2020. Climate Change and Minnesota's Forests. A report prepared for the Minnesota Forest Resources Council by the Research Advisory Committee. https://mn.gov/frc/assets/Climate_Change_and_Minnesota%27s_Forests_2020_tcm1162-471265.pdf

Griscom, B.W., et al. 2017. Natural climate solutions. *PNAS* October 31, 2017 114 (44) 11645-11650. https://doi.org/10.1073/pnas.1710465114

Gutknecht, J. and J. Jungers. 2021. Regenerative agriculture can provide many environmental benefits, but is not a "silver bullet" for climate change mitigation. Global Change Biology, in preparation for summer 2022 submission.

Interagency Climate Adaptation Team (ICAT). 2017. Adapting to Climate Change in Minnesota. Minnesota Pollution Control Agency. https://www.pca.state.mn.us/sites/default/files/p-gen4-07c.pdf

Janowiak, M., et al. 2017. Considering Forest and Grassland Carbon in Land Management. United States Department of Agriculture, U.S. Forest Service. https://www.fs.usda.gov/treesearch/pubs/54316

Johnson, W. Carter, et al. 2010. "Prairie Wetland Complexes as Landscape Functional Units in a Changing Climate." *BioScience*, vol. 60, no. 2, 2010, pp. 128–40, https://doi.org/10.1525/bio.2010.60.2.7.

Kolka, R., C. Trettin et. al. 2018. Chapter 13: Terrestrial wetlands. In *Second State of the Carbon Cycle Report (SOCCR2): A Sustained Assessment Report*. U.S. Global Change Research Program, Washington, DC. https://www.globalchange.gov/content/about-soccr-2

Lennon, Megan and E.A. Nater. 2006. Biophysical aspects of terrestrial carbon sequestration in Minnesota. St. Paul: University of Minnesota.

Minnesota Forest Resources Council. 2021. East Central Landscape Forest Resources Plan. https://mn.gov/frc/landscape/ec/

Minnesota Forest Resources Council. 2017. North Central Landscape Management Plan. https://mn.gov/frc/landscape/nc/

Minnesota Pollution Control Agency. 2021. Greenhouse gas emissions inventory, 2004-2018. Biennial report to the legislature. St. Paul: MPCA. https://www.pca.state.mn.us/sites/default/files/lraq-1sy21.pdf

MS-STEP Capstone Paper. 2022. Exploring policy recommendations for promoting climate resilient watersheds. University of Minnesota, Humphrey School of Public Affairs. https://bwsr.state.mn.us/sites/default/files/Exploring_Policy_Recommendations_for_Promoting_Climate_Resilient_Watersheds.pdf

National Wildlife Federation, Wildlife in a Warming World, January, 2013. https://www.nwf.org/~/media/PDFs/Global-Warming/Reports/NWF_Wildlife-Warming-World_Report_web.pdf

Noe, R., Keeler B., Twine T., Brauman K., Mayer T., Rogers M. 2019. Climate change projections for improved management of infrastructure, industry, and water resources in Minnesota. https://hdl.handle.net/11299/209130.

Ogle, S.M., et al. 2014. Chapter 3. Quantifying greenhouse gas sources and sinks in cropland and grazing land systems. In *Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory*. Technical Bulletin 1939. Office of the Chief Economist, USDA.

Paustian, K., et al. 2017. Quantifying soil carbon measurement for agricultural soils management: A consensus view from science. https://jahnresearchgroup.webhosting.cals.wisc.edu/wp-content/uploads/sites/223/2017/08/1.-Quantifying_soil_carbon_measurement_for_agricultural_soils_management_17.09.05.pdf

Paustian K., et. al. 2019. Quantifying carbon for agricultural soil management: from the current status toward a global soil information system, Carbon Management, 10:6, 567-587, DOI: 10.1080/17583004.2019.1633231

Pearson, T., Grimland, S., Brown, S. 2010. A spatial analysis of greenhouse gas emissions from agricultural fertilizer usage in the U.S., Winrock Institute.

Polasky, Stephen, and Y. Liu. 2006. The supply of terrestrial carbon sequestration in Minnesota. St.Paul: University of Minnesota. Report to Minnesota Legislature on Carbon Sequestration Capacities in Minnesota.

Swan, A. et al. 2020. *COMET-Planner: Carbon and Greenhouse Gas Evaluation for NRCS Conservation Practice Planning.* See http://comet-planner.com/

United States Department of Agriculture, National Agricultural Statistics Service. 2019. 2017 Census of Agriculture. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Minnesota/

United States Environmental Protection Agency. 2013. *Climate Change, Overview of Greenhouse Gases*. www.epa.gov/climatechange/ghgemissions/gases/n2o.html

United States Environmental Protection Agency. 2018. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016.* https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2016

Appendix A. Greenhouse Gas Reduction Estimation Methodology

Since 2009, BWSR has been estimating carbon storage from a variety of conservation practices, ranging from wetland restoration to establishment of cover crops and field windbreaks, documented in the eLINK reporting system and through the RIM easement program. Those estimates, based on a 2008 study (Anderson, et. al.), were updated in 2019 and have been further refined in this edition. A primary source for the analysis is the MPCA report "Greenhouse Gas Reduction Potential of Agricultural Best Management Practices," referred to below as the "MPCA GHG Reduction Study." The report provides a comprehensive synthesis of the methodologies used to estimate greenhouse gas emissions reduction potential from 21 practices related to changing land use, cropping practices, and nutrient reduction. It includes all the major greenhouse gases (GHGs): carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4). Some emission reduction factors were updated in 2021 and used in development of the Minnesota Climate Action Framework and in the calculations here.

A secondary source is the COMET-Planner tool and planning documents developed by USDA to estimate GHG reductions from NRCS conservation practices. We relied on COMET estimates for a few practices not included in the MPCA report.

How are emissions estimated?

Different GHGs can have different effects on the Earth's warming. These gases differ from each other in their ability to absorb energy (their "radiative efficiency"), and how long they stay in the atmosphere (also known as their "lifetime").

The Global Warming Potential (GWP) metric was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases.[2]

[2] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

The MPCA prepares a report to the Minnesota Legislature every two years on state greenhouse gas emissions. The most recent report (January 2021), Greenhouse Gas Emissions in Minnesota: 2004-2018, identifies emissions by sector – transportation, electricity generation, agriculture/forestry/land use, residential, commercial, and waste. The 2021 report identified a slight decline in emissions from the agriculture and forestry sector compared to 2005, but also a high degree of variability. Emissions of nitrous oxide and methane have both increased since 2005. Carbon sequestered in forest regrowth is a significant offset in this sector. While the statewide report does not quantify any GHG reductions provided by agricultural conservation practices, BWSR and partner agencies such as the Department of Agriculture are working to improve the ability to estimate these "working lands" benefits, as discussed in this appendix.

The MPCA's GHG Reduction Study addresses GHG emissions from soils (N_2O, CH_4 and CO_2), surface waters (N_2O), fuel use in field machinery in crop production (CO_2, N_2O), and mostly out-of-state manufacture of agricultural chemicals and fuels (mostly CO_2 and CH_4). The MPCA study also addresses terrestrial carbon sequestration, during which atmospheric CO_2 is withdrawn from the atmosphere and stored in terrestrial soil and biomass. To the degree that CO_2 is withdrawn from the atmosphere through photosynthesis, terrestrial carbon sequestration acts to lower atmospheric CO_2 levels, offsetting surface emissions of GHGs to the atmosphere.

The amount of offset from terrestrial carbon sequestration depends on how long the CO_2 that has been removed from the atmosphere is stored in terrestrial carbon pools before re-release to the atmosphere. To fully offset 1 ton of CO_2 emitted from the combustion of fossil fuels like coal, one ton of CO_2 removed from the atmosphere would need to be retained in soils and standing biomass for roughly 50 years. To offset about one-half of a ton of emitted CO_2, carbon removed from the atmosphere would need to remain stored in soils and biomass for about 25 years.

The GHG Reduction Study assumes that CO_2, once removed from the atmosphere, will remain in storage for 20 years, offsetting about 0.4 tons of emitted GHGs for each ton sequestered. In the language of climate science, this is equivalent to a GWP of 0.4.

The MPCA uses a 20-year time period for reasonably certain future storage of sequestered carbon for several reasons:

- 20 years is considered a reasonable assumption for the duration of agricultural and forestry practices. Some practices, such as cover crops and conservation tillage, can have relatively short durations, based on changes in land ownership, program funding, or other economic considerations. Others, such as conservation cover planted through an easement program, are theoretically permanent. Therefore, the 20-year timeframe provides a common denominator across practices and programs.

- Climate change itself can affect the feasibility and effectiveness of many conservation practices, e.g., increasing wildfires changing the composition and health of forests, flooding affecting perennial crops, drought affecting wetlands, etc. Looking beyond a 20-year horizon would increase the uncertainty on practice effectiveness.

For internal consistency, the MPCA applied the GWP value of 0.4 to all types of carbon sequestration from all practices. However, it is important to note that most of BWSR's easement programs provide

permanent protection, which can increase the effectiveness of carbon sequestration over as much as 40 or 50 years, or substantially longer than the 20 years assumed in the MPCA study.

Conservation practices tracked in eLINK

We assessed the conservation practices tracked in eLINK and selected those that are directly comparable to the practices assessed in the MPCA GHG Reduction Study, or to livestock practices identified in COMET-Planner. Table A-1 is a compilation of acreage in each practice as of August 2021, and the estimated metric tons per acre of GHG reduction, in CO_2 equivalents. Some notes and assumptions that go into this process:

- Where dimensions of a practice are recorded in linear feet – windbreaks, for example – we used an estimate of average width to derive acres – generally 30 to 50 feet, depending on the practice.
- In a few instances where practices are simply counted, such as water and sediment control basins, we estimated an acreage likely to be vegetated – for example, one acre of perennial vegetation was assigned for each basin.
- For the relatively small acreage of wetlands that have been created rather than restored, we made several assumptions, based on discussions with MPCA staff and related research:
    - Methane emissions are highest in wetlands that are permanently or frequently inundated, while seasonally inundated wetland types such as wet meadows seem to sequester more GHGs than they emit.
    - About two-thirds of restored or created wetlands appear to consist of wet meadows and other areas that are seasonally inundated. These wetland types seem to act more like riparian buffers. The remaining one-third are permanently inundated, making them net sources of methane.
- Using this ratio, we estimated net GHG emissions from all restored and created wetlands. Combining these estimates, net carbon sequestration is greater than methane emissions. Additional research and geospatial analysis of wetland types and their respective emissions profiles would help refine these and other estimates.

Another major assumption is that practices, once installed, remain in place. Grant requirements generally require that structural practices remain in place for at least 10 years, while non-structural practices vary in duration. Land management practices such as cover crops are required to remain in place for three years under current grant policies. While we can't verify the current status of installed practices, the assumed 20-year duration built into the MPCA emission reduction estimates provides a common standard for both temporary and permanent practices.

Conservation practices tracked on RIM easements

RIM easements are managed through development of a conservation plan that identifies the acreage on each easement property to be protected or restored through a variety of conservation practices. We tracked the following conservation practices applied to RIM easements:

- Conservation Cover
- Diversion
- Windbreak/Shelterbelt Establishment
- Grassed Waterway
- Tree/Shrub Establishment
- Water and Sediment Control Basin
- Restoration and Management of Declining Habitats
- Wetland Restoration
- Wetland Creation

As with the eLINK data, practices were equated to the MPCA-identified conservation practices and the same estimates of GHG emission reductions were used.

Several easement categories were not included in the estimates. Army Compatible Use Buffers (ACUB) easements, used to limit development around Camp Ripley, were not included since most do not require conservation practices. Wetland bank easements were not included because they are used to compensate for wetland removals elsewhere (see below).

Due to changes in the database and recording practices, easements recorded between 1987 and 2003 show discrepancies between total acreage and the acreage in the conservation plan, leading to substantial overcounting. Parcels with minimal discrepancies – 2.5 acres or less – are included in the acreage totals. Parcels with larger discrepancies are excluded; these comprise about 75,000 acres, or about one-third of the pre-2004 easement acres.

Easements including already established practices are also included in the analysis, since most "established" acres were converted from cropland under previous programs, generally CRP, before they were placed under easement. The results of this analysis are shown in Table A-2.

Wetland banking practices not included: The 2019 edition of this report included estimates of GHG reductions on about 11,000 acres of wetland banks where actual restoration occurred (other wetland bank areas preserved existing wetlands). For this update we determined that because wetland banks are created to allow purchase of credits compensating for wetland removals elsewhere, estimates of "net" GHG reductions are too difficult to assess without further research.

Conclusions: impacts of BWSR programs on the agricultural sector

The combined total GHG reductions of BWSR's programs in 2021 were approximately **782,000 CO_2-equivalent metric tons**, or **862,000 US CO_2 e-tons per year**. The estimated emissions of the agriculture, forestry and land use sector were estimated by the MPCA at about **38.3 million CO_2 US tons** in 2018, of which almost **27 million tons** were emitted from cropland. Using the estimates outlined above, the combined impacts of BWSR's conservation and easement programs on the emissions of the agricultural-

forestry-land use sector are clearly quite small – **2.2 percent of total emissions, or 3.2 percent of cropland emissions**. Note, however, that this assessment does not include the impacts of related state and federal programs and of voluntary practices:

- **NRCS programs** such as EQIP and CSP are used to support conservation practices on thousands of acres in Minnesota, including the same practices that BWSR supports and tracks in eLINK. Quantifying the extent and GHG mitigation benefits of those federally-supported acres is an important next step.

- Likewise, the benefits provided by the roughly 1.13 million acres in the **Conservation Reserve Program** in 2018 have not been quantified. While CRP acreage has declined in the past decade, the 2018 farm bill increases the nationwide cap on CRP acreage from 24 million to 27 million acres, and includes practices such as grassed waterways, filter strips, riparian buffers, and wetland restoration.

- The **Minnesota Agricultural Water Quality Certification Program**, a voluntary program administered by the Minnesota Department of Agriculture, tracks the GHG mitigation benefits of practices adopted by participating producers – currently almost 800 producers on over 500,000 acres participate, with estimated GHG reductions of over 30,000 CO_2-e tons per year.

- **Minnesota's Buffer Law**, enacted in 2015, requires a continuous riparian buffer of perennial vegetation along public waters (a 50-foot average width and 30-foot minimum width) and public drainage ditches (16.5-foot minimum). It is estimated that over 100,000 acres of new buffers have been installed to comply with the law, with related GHG reduction benefits.

- In addition, many farmers and landowners adopt conservation practices independent of any federal or state program. The **2017 Census of Agriculture** shows increases in the acreage in many GHG-reducing conservation practices:

    - Acreage in no-till practices increased from 818,754 in 2012 to 1,091,337 in 2017, or about 33%

    - Acreage in other conservation tillage practices increased from 6.1 million in 2012 to 8.2 million in 2017, or about 34%

    - Cover crop acreage increased from 408,190 to 579,147, or 41%

By continuing to assess and quantify the benefits of these programs, we can gain a clearer picture of the contributions of the agricultural sector to climate change mitigation and the potential for increasing those efforts.

Table A-1. Agricultural BMPs Reported in eLINK	NRCS CODE	TOTAL ACRES	TOTAL FEET	TOTAL COUNT	CORRECT FEATURE TYPE	TOTAL # PRACTICES	MPCA Practice or Equivalent	Metric Tons/ac/yr	Total MT/yr
155M - Storm Water Retention Basins	155M	372	2,020	372	Point	430	Grassland Riparian Buffers	0.70	261
327 - Conservation Cover	327	4,643.27	1,500	4	Polygon	2,481	Cropland to native grassland	1.44	6,698
327M - Conservation Easement	327M	5,772.03			Polygon	450	Cropland to native grassland	1.44	8,326
328 - Conservation Crop Rotation	328	622		42	Polygon	51	Perennial added to annual	0.37	231
329B - Conservation Tillage - Reduced Tillage	329B	29,172			Polygon	332	Reduced Tillage	0.06	1,853
332 - Contour Buffer Strips	332	653			Polygon	41	Field Borders, Filter Strips, etc.	1.43	936
340 - Cover Crop	340	111,690		4	Polygon	8,206	Winter cover crop/Catch crop	0.24	27,357
342 - Critical Area Planting	342	43,105	31,982	11	Polygon	14,350	Cropland to native grassland	1.44	62,176
350 - Sediment Basin	350	290		290	Point	285	Grassland Riparian Buffers	0.70	203
362 - Diversion	362	141	122,629	0	Line	1,473	Field Borders, Filter Strips, etc.	1.43	202
380 - Windbreak/Shelterbelt Establishment	380	4,205	6,106,158	1,657	Line	6,753	Shelterbelts, Hedgerows (trees)	2.70	11,369
390 - Riparian Herbaceous Cover	390	408	40		Polygon	98	Grassland Riparian Buffers	0.70	286
391 - Riparian Forest Buffer	391	4,433			Polygon	1,014	Forested and Multispecies Riparian Buffers	2.00	8,869
393 - Filter Strip	393	64,595	4,870	21	Polygon	8,215	Field Borders, Filter Strips, etc.	1.43	92,588
412 - Grassed Waterway and Swales	412	14,166	68,913	5	Polygon	16,626	Field Borders, Filter Strips, etc.	1.43	20,305
512 - Forage and Biomass Planting	512	1,609			Polygon	169	Cropland to pasture	1.10	1,766
528 - Prescribed Grazing	528	8,453		1	Polygon	134	Prescribed Grazing (COMET)	0.26	2,198
543 - Land Reclamation, Abandoned Mined Land	543	2			Polygon	1	Cropland to native grassland	1.44	3
580 - Streambank and Shoreline Protection	580	1,146	1,664,509	9	Line	17,526	Grassland Riparian Buffers	0.70	804
585 - Stripcropping	585	1,281			Polygon	32	No-till Tillage	0.13	166
590 - Nutrient Management	590	224,600		2	Polygon	1,551	15% Fertilizer Use Reduction	0.05	10,605
600 - Terrace	600	14,151	6,748	0	Polygon	882	Field Borders, Filter Strips	1.43	20,283
612 - Tree/Shrub Establishment	612	41,906	13,625	2,576	Polygon	4,643	Cropland Idling: Afforestation	2.32	97,323
638 - Water and Sediment Control Basin	638	7,833	10,531	7,833	Point	41,929	Grassland Riparian Buffers	0.70	5,472
643 - Restoration and Management of Declining Habitats	643	14,438			Polygon	1,564	Cropland to native grassland	1.44	20,825
644 - Wetland Wildlife Habitat Management	644	153			Polygon	7	Wetland	2.12	325
645 - Upland Wildlife Habitat Management	645	10,236			Polygon	270	Cropland to native grassland	1.44	14,765
650 - Windbreak/Shelterbelt Renovation	650	102	148,356		Line	146	Shelterbelts, Hedgerows	2.70	276
657 - Wetland Restoration	657	7,447		13	Polygon	386	Wetland Restoration	2.01	14,974
658 - Wetland Creation	658	51			Polygon	19	Wetland Creation	see notes	13
712M - Bioretention Basin	712M	1,154	390	1,154	Point	1,186	Grassland Riparian Buffers	0.70	809
810M - Storage and Treatment Wetland Restoration	810M	7			Polygon	3	Wetland Creation	see notes	2
		618,839						**TOTAL**	**432,270**

Mitigation - accepted practices
Potential Mitigation - more research needed
Acres used except as noted:
X,XXX - acres derived from linear feet * width or points (i.e., basins)

Table A-2. Conservation Practices on RIM Easements

RIM PRACTICE	NRCS CODE	PRACTICE DESCRIPTION	MPCA EQUIVALENT	2021 PRACTICE ACRES	US Tons/Acre	MT/Acre/yr	TOTAL MT/yr
RR2 - Native Grasses	327	Conservation Cover	Cropland Idling: Grassland Restoration	48,658	1.59	1.44	70,187
RRFB - Native Grasses with Forbs	327	Conservation Cover	Cropland Idling: Grassland Restoration	32,448	1.59	1.44	46,804
RR1 - Introduced Grasses and Legumes	327	Conservation Cover	Cropland Idling: Grassland Restoration	7,588	1.59	1.44	10,946
RR9 - Vegetative Cover Already Established	327AE	Conservation Cover Already Established	Cropland Idling: Grassland Restoration	29,953	1.59	1.44	43,206
RR5 - Diversion	362	Diversion	Field Borders, Filter Strips, etc.	3.4	1.58	1.43	5
RR4 - Field Windbreak	380	Windbreak/Shelterbelt Establishment	Shelterbelts, Hedgerows	96.5	2.98	2.70	261
RR11 - Highway Windbreak (Living Snowfence)	380	Windbreak/Shelterbelt Establishment	Shelterbelts, Hedgerows	33.6	2.98	2.70	91
RR14 - Existing Watercourse/drainage ditch	390AE	Riparian Herbaceous Cover Already Established	Grassland Riparian Buffers	1,142	0.77	0.70	798
RR7 - Grass Waterway	412	Grassed Waterway	Field Borders, Filter Strips, etc.	1.2	1.58	1.43	2
RR3 - Tree and/or Shrub Planting	612	Tree/Shrub Establishment	Cropland Idling: Afforestation	9,287	2.56	2.32	21,569
RR10 - Trees and/or Shrubs- Already Established	612AE	Tree/Shrub Already Established	Cropland Idling: Afforestation	19,433	2.56	2.32	45,131
RR6 - Erosion Control Structure	638	Water and Sediment Control Basin	Grassland Riparian Buffers	3.2	0.77	0.70	2
RR2PP - Pollinator Planting	643	Restoration and Management of Declining Habitats	Cropland Idling: Grassland Restoration	293.2	1.59	1.44	423
RR8 - Wetland Restoration	657	Wetland Restoration	Restored Wetlands	43,846.2	2.22	2.01	88,161
RR13 - Existing Wetland/Waterbody	657AE	Wetland Restoration Already Established	Restored Wetlands	11,565	2.22	2.01	23,253
RR12 - Wetland Creation	658	Wetland Creation	Constructed Wetlands	43.7		see notes*	11
			TOTAL	**204,395**			**350,846**

* wetlands: 1/3 open water @ -0.6, 2/3 wet meadow @ 0.7

Last updated October 19, 2018

BWSR Board Member Conflict of Interest in Grant Review – Disclosure Form

Meeting: **Date:**

I certify that I have read and understand the descriptions of conflict of interest provided, reviewed my participation for conflict of interest, and disclosed any perceived, potential, or actual conflicts. As a BWSR Board member, appointed according to Minnesota Statute Section 103B.101, I am responsible for evaluating my participation or abstention from the review process as indicated below. If I have indicated an actual conflict, I will abstain from the discussion and decision for that agenda item.

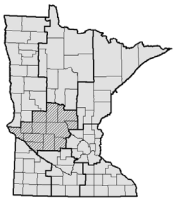
Please complete the form below for all agenda items. If you indicate that you do not have a conflict for an agenda item, you do not need to fill out additional information regarding that agenda item.

Agenda Item	**No conflict** (mark here and stop for this row)	**Grant applicant(s) associated with conflict** (required if conflict identified)	**Conflict Type** (required if conflict identified)	**Will you participate?** (required if conflict identified)	**Description of conflict** (optional)
				Yes / No	
				Yes / No	
				Yes / No	
				Yes / No	

Printed name: _____

Signature: _____ Date:_____

All disclosed conflicts will be noted in the meeting minutes. Conflict of interest disclosure forms are considered public data under Minn. Stat. §13.599.



West Central Technical Service Area
(WCTSA)
Serving the 12 SWCD's in West Central Minnesota

110 Second St. S., Suite 128,
Waite Park, MN 56387

Phone: 320-251-7800 x. 3 Fax: 855-205-6907

September 22, 2022

Minnesota Board of Water and Soil Resources
c/o Executive Director John Jaschke
520 Lafayette Road North
St Paul, MN. 55155

Dear BWSR Board members;

BWSR provides an additional $20,000 once every four years to each Technical Service Area (TSA) through the Nonpoint Engineering Assistance Program (NPEA) using State General Fund allocations. The FY20-21 allocations showing the 4 TSA areas getting the additional equipment funding are listed here: FY20-21 TSA.pdf (state.mn.us)

These amounts have been insufficient to replace existing equipment when needed, much less increase TSA capabilities. The TSA has had to supplement with other funds or go through the workplan modification processes to use funds from the Enhanced Shared Technical Services (ESTS) grants. Doing so reduces the TSA's financial health or ability to continue/expand technical services as needs increase.

We would propose increasing the amount of equipment funds available to $40,000. This would allow all TSAs to have most capable equipment to maximize conservation delivery across the State.

Thank you for your consideration.

c: LeAnn Buck, MASWCD Executive Director
Rita Weaver, BWSR Chief Engineer

Sincerely,

Dennis Fuchs
WCTSA Host Manager

Wetland mitigation on ag lands

Updated guidance streamlines process, improves quality of restorations

The first site in Minnesota to use new guidelines to calculate the value of wetland restorations on former cropland, a Roseau County parcel that drains to the Warroad River and Lake of the Woods, illustrates the benefits of the crediting system developed by the Minnesota Board of Water and Soil Resources (BWSR) and the St. Paul District of the U.S. Army Corps of Engineers (USACE).

Wetlands are protected by federal, state and sometimes local laws and regulations. In Minnesota, the primary state wetland protection law is the Wetland Conservation Act (WCA). The WCA was passed by the state Legislature in 1991 to protect wetlands and the benefits they provide. It is one of the most comprehensive wetland protection laws in the country, administered by BWSR and implemented by local governments.

In some cases, draining or filling wetlands is allowed when the lost functions and values of those wetlands are adequately replaced by restoring, enhancing or creating wetlands elsewhere. This process is commonly referred to as wetland replacement or mitigation.

The most common mitigation mechanism in Minnesota is wetland banking, where wetland mitigation credits are withdrawn from the state Wetland Bank. These credits essentially represent acres of wetlands that have been previously approved for mitigation, subsequently restored, and then deposited in the bank for use in replacing future wetland impacts.

One of the methods used to generate mitigation credits is the restoration of partially drained, farmed wetlands.

Previously, credit for partially drained agricultural wetlands was allocated based primarily on the number of years the wetland was planted with annually seeded crops such as corn or soybeans. The more years it was planted, the more credit was allocated when restored. This assumed that the more the wetland area was planted, the more drained and degraded it was, and the more value it would have if restored.

The first site to use the new method of calculating the value of wetland restorations on former cropland was a partially drained, farmed Roseau County site restored in 2020 through a partnership between BWSR and the landowner. Under the previous crediting system, the site may not have produced enough mitigation credits to offset the investment and risk in establishing a wetland mitigation bank. **Contributed Photos**

That approach could lead to overlooking lands with high restoration potential and high public value for mitigation in cases where landowners decided not to plant — as a business decision or for other reasons. Additionally, applicants and their consultants were incentivized to devote significant time and resources to distinguishing drained from partially drained wetlands. That task is especially difficult when previous planting history is sparse.

Under this approach, productive cropland with effective drainage often provided the most credits while less productive cropland yielded fewer credits — even if it provided more public value related to wetland functions.

In response, BWSR and the USACE began collaborating on ways to streamline the crediting process in agricultural landscapes and provide more incentive to restore partially drained and marginally productive lands when such lands provide significant public value.

For qualifying projects, the new method eliminates the need to distinguish drained from partially drained wetlands in crop fields, and de-emphasizes planting history as a surrogate for the degree of wetland degradation.

In May 2019, the agencies provided new joint guidance for crediting wetland restorations on cultivated fields in Minnesota.

The "Alternative Method for Determining Wetland Credit Potential for Hydrologic Restorations on Cultivated Fields in Minnesota" provides an improved method for determining functional gains, and corresponding credit amounts, resulting from the hydrologic restoration of drained and/or partially drained croplands.

For qualifying projects, the new method eliminates the need to distinguish drained from partially drained wetlands in crop fields, and de-emphasizes planting history as a surrogate for the degree of wetland degradation.

BWSR immediately began using the new guidance to develop wetland bank sites for the Local Government Roads Wetland Replacement Program (LGRWRP).

The first site to use this new method was a partially drained, farmed wetland that was restored in Roseau County in fall 2020 through a partnership between BWSR and the landowner. The site was regularly cultivated but was not always planted due to frequent flooding from the Warroad River. When it was planted, crop yields were minimal. Yet due to the frequent flooding, the site was a significant contributor of sediment and nutrients to the Warroad River and, ultimately, Lake of the Woods.

Under the previous crediting system, the site may not have produced enough mitigation credits to offset the investment and inherent risk in establishing a wetland mitigation bank. But the new guidance increased the mitigation credits yield. This credit increase was more consistent with the function and value gained from restoration of the wetland on this site, and it sufficiently offset the investment and risk of establishing the wetland bank.

This new method for crediting wetland restorations on partially drained agricultural land expands mitigation banking opportunities, increases efficiency in the review and approval process, and focuses more attention on the functional benefits of wetland restoration. Better replacement wetlands ultimately improve the extent to which the legislative goals of WCA are being achieved.

BWSR joins partners on tour

Virginia Regorrah of the U.S. Army Corps of Engineers discussed work at the Grand Forks Riverside Park Dam on Aug. 24, during the Red River Partners Summer Tour. **Photo Credits:** Jenny Gieseke, BWSR

Flood damage reduction and water quality projects take center stage during an annual conservation tour set in the Red River Valley and presented by a host of state, regional and local partners.

CLEAN WATER LAND & LEGACY AMENDMENT

A late-August tour in the East Grand Forks area crossed state lines and encouraged stakeholders to collaborate as they approach local conservation and water quality projects.

Minnesota Board of Water and Soil Resources (BWSR) Board members, staff and partners gathered Aug. 24 for an annual conservation project tour.

Stops featured projects focused on flood damage reduction and water quality in the Red River basin. More specifically, the tour highlighted flooding and mitigation sites in northwest Minnesota and North Dakota.

Unlike previous BWSR Board tours, this daylong event was routed through Minnesota and North Dakota. Local government units in coordination with BWSR typically host the tour, but this year several local, regional, state, federal and national partners assisted with tour planning. Rob Sip, Red River Watershed Management Board executive director, began reaching out to partners last winter to gauge interest in a combined effort. With their support, Sip started coordinating several tour planning meetings per month.

The Grand Forks Riverside Park Dam was featured Aug. 24 during the Red River Partners Summer Tour.

"It was not just one person or one entity, it was several coming together," Sip said of planning the tour.

Tour planning partners included the Red River Basin Commission, the Red River Retention Authority, the Red River Joint Water Resource District, the Minnesota Association of Watershed Districts, the Minnesota Association of Conservation District Employees and BWSR.

A tour planning subcommittee selected nine different project sites. At some sites, participants disembarked the bus to have a closer look and hear about the project from the project managers, while others were drive-by sites, with tour guides sharing more information about the project on the bus. Subcommittee members said they wanted to create a well-rounded tour and began brainstorming tour stop ideas early on; these ideas were then presented at a larger planning meeting.

"Once we started narrowing them (site ideas) down, I really looked for the projects that highlighted the multi-benefit aspects," said Matt Fischer, subcommittee member and BWSR board conservationist. "Projects that are doing flood damage reduction, they have water quality components, and they have habitat components."

While most projects were already complete at the time of the tour, others were still in the planning phase. The tour featured

Dan Money of Two Rivers Watershed District discussed the Springbook Flood Protection Project on Aug. 24, during the Red River Partners Summer Tour.

The Agassiz Valley Water Resources Management Project was developed under a mediation agreement between the state of Minnesota and the Red River Watershed Management Board. It was designed for flood control and environmental enhancements, and spans about 2,600 acres in Marshall and Polk counties.

drainage, soil conservation, wildlife habitat and flood damage reduction projects.

"My hopes were to really showcase the diversity of work being done in the Red River basin. I think a lot of times people from outside the area think, 'It's only flood damage reduction. That's what they do up there,'" Fischer said. "But these projects are complex, and they go through lengthy processes with multiple stakeholders to really take advantage of achieving multiple benefits."

Approximately 120 people attended the tour. A popular spot amongst the group was the Agassiz Valley Water Resources Management Project. It offers multiple benefits, such as flood damage reduction, improved water quality and habitat development. Fischer said participants thought the project was impressive and expressed their desire to return during the migration season because the project had also partnered with the Audubon Society and there could be ample bird-watching opportunities.

Ryan Hughes, BWSR northern regional manager, said the tour was the most complex tour that he has ever been involved with.

"My hope, from a regional perspective, was to showcase the complexity of projects in the Red River basin area, and the diversity of partners, and emphasize collaboration and partnership, which leads to beneficial projects being implemented on the ground," Hughes said.

Based on feedback, Hughes said it's safe to say people enjoyed the trip and believed it exhibited a good mixture of projects. Attendees also received tour packets full of project information to read during their transition from one stop to another.

Sip, Hughes and Fischer said they hoped attendees were able to walk away inspired to create more partnerships and to find more ways to work together to benefit Minnesota's lands and waters.

Funding for the tour came primarily from the River Watershed Management Board, with BWSR chipping in as well. Fees collected by tour organizers from the attendees helped cover the majority of the costs.

Morrison SWCD, NRCS support forester

CLEAN WATER LAND & LEGACY AMENDMENT

"A lot of my job is to guide people in the right direction," said Morrison SWCD forester Lew Noska, who spends part of his time at Camp Ripley. "I want to have the tools to offer landowners the best possible (management) tools for their property, whether it be for wildlife, water or just species diversity and resiliency."

Photo Credits:
Ann Wessel, BWSR

Natural Resources Conservation Service website:
www.nrcs.usda.gov

When the Morrison Soil & Water Conservation District (SWCD) hired forester Lew Noska, it expanded the capacity to provide expertise — and one more point of contact — for landowners throughout Morrison County and the Camp Ripley Sentinel Landscape.

"There is a large chunk of Morrison County that is forested," said Morrison SWCD Manager Shannon Wettstein. "To have someone that can specifically help landowners with their questions and how to manage lands is priceless."

Wettstein said Noska will be one more person landowners can get to know, trust and work with directly.

Noska earned a biology degree from Minnesota State University Moorhead in 2006, and then worked for an uncle's Browerville-based heating, ventilation and air conditioning business for 12 years. Most recently, he worked for five years as Todd County SWCD's wetland coordinator and buffer specialist. Noska joined the Morrison SWCD staff in November 2021. He remains a certified wetland delineator, and is the Walk-In Access coordinator for that DNR program in Morrison, Cass and Crow Wing counties.

A $400,000, three-year contribution agreement between NRCS and the Morrison SWCD, which took effect in August 2021, is bringing forestry related training and technical assistance to the 805,000-acre Sentinel Landscape, a 10-mile buffer that simultaneously protects natural resources and the National Guard's training mission. The agreement gave the SWCD the means to hire a forester, and to subcontract with the Forest Stewards Guild to train regional staff and landowners in prescribed burning.

Since he joined the Morrison SWCD in November, Noska has facilitated Forest Stewards Guild prescribed burn trainings for landowners hosted by Camp Ripley.

The contribution agreement requires

Noska to complete 45 field visits with landowners and write 30 management plans. Forestland makes up 35% of the Camp Ripley Sentinel Landscape, primarily in Cass, Crow Wing, northern Morrison and part of Todd counties. All but 0.5% of those forests are privately owned.

Noska meets with landowners to see their property, hear their goals, and then write a management plan. Management plans that identify resource concerns are the basis for landowners to apply for assistance through NRCS' Regional Conservation Partnership Program (RCPP). That five-year $2.76 million RCPP renewal took effect in July.

"It's just getting them that first initial contact where they can take that first step and get comfortable working with us, and then we can direct them in the right direction for what their objectives are, be it wildlife habitat, be it timber management — even if they want to harvest timber," Noska said.

"There is a large chunk of Morrison County that is forested. To have someone that can specifically help landowners with their questions and how to manage lands is priceless."

— Shannon Wettstein, Morrison SWCD manager

"We're trying to create more opportunities for landowners to learn alongside of us, and bring in more dollars so they can do the management if they're so inspired after they learn more about what they can do on their land."

— Josh Hanson, NRCS district conservationist

Noska spends some of his time at Camp Ripley, where he earned a firefighter certification that allows him to work on its prescribed burn crew, and where he is working toward NRCS job approval authority. He facilitates Camp Ripley-hosted events for landowners and conservation professionals — including Forest Stewards Guild learn-and-burn workshops, and a planned Oct. 1 forestry field day.

"We're trying to create more opportunities for landowners to learn alongside of us, and bring in more dollars so they can do the management if they're so inspired after they learn more about what they can do on their land," said NRCS District Conservationist Josh Hanson.

An undisturbed, forested stretch of the Mississippi River runs for 18 miles through Camp Ripley. The river is seen here from a boat launch at Camp Ripley.

BOARD OF WATER AND SOIL RESOURCES

Organizational Chart

September 12, 2022

BWSR BOARD

Executive Director [1]
John Jaschke

Executive Support [1]
Rachel Mueller

Legend:

- **Executive Leadership** [1] / **Senior Management**
- Staff / ***Supervisor***
- Current Vacancy
- Temporary Supervisor/supervision ^ *
- Dept. in another agency [2]
- WOOC = work out of class
- LOA = leave of absence

Programs and Policy Development Division

Assistant Director [1]
Dave Weirens

Special Projects Coordinator
Suzanne Rhees

Conservation Easements

Section Manager
Sharon Doucette

Easement Programs

FBAP/CREP Implmnt Coordinator
Vacant
Cons. Programs Consultant
Bill Penning
Private Lands Coordinator
Vacant
Working Lands Specialist
John Voz
Easement Programs Coordinator
Dusty Van Thuyne

Program Analyst
Vacant
Easement Data Specialist
Patrick Sherman
Assistant Program Analyst
Vacant
Office & Admin Spec.
Sumbal Rana

Easement Man. and Acq.

Easement Supervisor
Lucy Dahl
Easement Acquisition Spec Sr
Brittany Polzin
Conservation Easement Specialist Lead
Karli Tyma
Easement Development Specialist Sr.
Peter Jordet
Easement Development Specialist
Vacant
Vacant
Easement Acquisition Specialist
Zachary Braun
Rick Ingli
Vacant
Vacant
Vacant
Vacant

SWCDs, FBA, Federal Partners, landowners

Wetlands

Section Manager
Les Lemm

Wetland Program Assisant
Amy Waters
Wetlands Policy Coordinator
Lewis Brockette

WCA Operations

WCA Operations Supervisor
Ken Powell
Wetland Specialist
Jed Chesnut
Alyssa Core
David Demmer
John Hansel
Steven Hofstad
Matt Johnson
Ben Meyer
Lynda Ponting
Cade Steffenson

Wetland Banking

Wetland Mitigation Supervisor
Dennis Rodacker
Mitigation Program Coordinator
Ben Carlson
Wetland Banking Specialist
John Overland
Wetland Mitigation Specialist
Kane Radel
Monitoring Specialist
Vacant
Wetland Mitigation Program Asst.
Solimar Garcia Barger

WCA LGUs, SWCDs, Local Road Authorities, Counties, Landowners

Engineering

Chief Engineer/Manager
Rita Weaver

Wetland Restoration

Water Resources Engineer
Tom Wenzel
Sr. Engineer
Vacant
Wetlands Engineering Tech Sr.
Karen Bonde
Jim Luniewski
Wetlands Engineering Tech
Josh Swanson
Vacant
Wetlands Engineering Aide Sr
Siri Doyle
Project Engineer
Terry Ragan
Wetlands Engineering Tech
Mike Anderson
Mitch Cabak
Scott Santjer
Bruce Wilken
Mark Yrjo

Technical Training - Eng

Regional Training Engineer
Amanda Deans
Aaron Peter
Patrick Schultz

WCA LGUs, SWCDs, Local Road Drainage Authorities, Landowners

Resource Conservation

Section Manager
Tom Gile

Buffers and Soil Loss

Buffers and Soil Loss Coordinator &
Appeals & Reg. Compliance Coord.
Travis Germundson
Buffers and Soil Loss Specialist
Kevin Roth
Vacant
Vacant

Vegetation / Soils

Sr. Ecologist/Veg. Specialist
Dan Shaw
Conservation Technician
Vacant
Ecological Science Conservationist
Paul Erdmann

MN Office for Soil Health [2]

PhD Researcher
Anna Cates

Technical Training- Resource

Resource Training Conservationist
Kristin Brennan
Kelly Voigt

SWCDs, WDs, TSAs, WCA LGUs, Drainage Authorities, landowners

Strategy and Operations Division

Assistant Director [1]
Vacant

Legislative Coordinator
Michael Nelson
Senior Legal and Program Advisor
Craig Engwall
Human Resources Director
Patty Sweep

Organizational Effectiveness

Section Manager
Jenny Gieseke

Internal Controls/Compliance

Compliance Coordinator
Amie Wunderlich

Training

Technical Training & Certification Coord.
Jon Sellnow
Training Coordinator
Barbara Radke

Evaluation

PRAP Coordinator
Jenny Mocol-Johnson

Communications

Communications Coordinator
Mary Juhl
Information Officer
Ann Wessel
Communications Specialist
Ashley Rezachek
Student Worker
Elizabeth Sykes

SWCDs, WDs, WMOs, Counties, JPB, TSA, Federal Partners

Fiscal and Admin Services

Chief Financial Officer [1]
Jeremy Olson

Finance & Accounting

Lead Accounting Officer
Bob Kronick
Contracts Accountant
Vacant
Accounting Technician
Cari Cable
Vacant
Office & Admin Asst Front Desk
Vacant
Facilities Projects Consultatnt
Mary Norton
Financial Analyst
Teressa Pickar

MN.IT Services [2]

MNIT Services Mgr, BWSR
Robert Wehausen
MNIT eLINK Specialist, BWSR
Conor Donnelly
MNIT GIS Specialist, BWSR
Aaron Spence
MNIT Project Manager, BWSR
Seth Weeks
MNIT Business Analyst, BWSR
Amir Khimji

SWCDs, WDs, TSAs

Regional Operations Division

Assistant Director [1]
Justin Hanson

Grants & Central Region

Section/Reg Manager
Marcey Westrick

Clean Water Specialist
Barb Peichel
Brad Wozney
Board Conservationist
Steve Christopher
Michelle Jordan
Darren Mayers
Jason Weinerman
Vacant
Grants Compliance Spec.
Linda Donnay

Cntrl/Org Eff/Res Cons OAS

Office & Admin Spec.
Cecelia Rost

Local Water Mgt

eLINK Data Specialist
Christa Branham-MacLennan
Grants Coordinator
James Adkinson
Grants and eLINK Specialist
Gwen Steel
Grants Specialist
Kari Keating
Water Programs Coordinator
Melissa King
1W1P Program Coordinator
Julie Westerlund
Reporting & Outcomes Coord.
Matt Drewitz
Clean Water Coordinator
Annie Felix-Gerth

SWCDs, WDs, WMOs, Counties, JPB, TSA

Southern Region

Regional Manager
Ed Lenz

Clean Water Specialist
Mark Hiles
Shaina Keseley
Board Conservationist
Jason Beckler
Adam Beilke
Dave Copeland
Doug Goodrich
Jeremy Maul
Jill Sackett Eberhart
John Shea
Grants Compliance Spec.
Julie Krebs
Office & Admin Spec.
Roxie Serreyn
Carla Swanson-Cullen

SWCDs, WDs, Counties, JPB, TSA

Northern Region

Regional Manager
Ryan Hughes

Clean Water Specialist
Jeff Hrubes
Red River Valley Clean Water Spec
Henry Van Offelen
Private Forested Watersheds Protection Coord.
Lindberg Ekola
Board Conservationist
Brett Arne
Matt Fischer
Erin Loeffler
Chris Pence
Chad Severts
Pete Waller
Grants Compliance Spec.
Jeannette Austin
Office & Admin Spec.
Donna Caughey
Carrie Rust-Moline
Vacant

SWCDs, WDs, Counties, JPB, TSA

☐ IN-STATE ☐ SHORT TERM ADVANCE
☐ OUT-OF-STATE ☐ RECURRING ADVANCE

SEMA4 EMPLOYEE EXPENSE REPORT

☐ Check if advance was issued for these expenses
☐ FINAL EXPENSE(S) FOR THIS TRIP?

Employee Name	Home Address (Include City and State)	Permanent Work Station (Include City and State)	Agency	1-Way Commute Miles	Job Title

Employee ID	Rcd #	Trip Start Date	Trip End Date	Reason for Travel/Advance (30 Char. Max) [example: XYZ Conference, Dallas, TX]	Barg. Unit	Expense Group ID (Agency Use)

Chart String(s)	Accounting Date	Fund	Fin DeptID	AppropID	SW Cost	Sub Acct	Agncy Cost 1	Agncy Cost 2	PC BU	Project	Activity	Srce Type	Category	Sub-Cat	Distrib %
A															
B															

A. Description:

B. Description:

Date	Daily Description	Itinerary: Time	Itinerary: Location	Trip Miles	Total Trip & Local Miles	Mileage Rate	Meals ✓ B	L	D	Total Meals (overnight stay)	Total Meals (no overnight stay) taxable	Lodging	Personal Telephone	Parking	Total
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			Depart / Arrive				☐	☐	☐						0.00
			VEHICLE CONTROL #		Total Miles 0					Total MWI/MWO 0.00	Total MEI/MEO 0.00	Total LGI/LGO 0.00	Total PHI/PHO 0.00	Total PKI/PKO 0.00	Subtotal (A) 0.00

Figure mileage reimbursement below

MILEAGE REIMBURSEMENT CALCULATION

Enter the rates, miles, and total amounts for the mileage listed above. Get the IRS rate from your agency business expense contact.	Rate	Total Miles	Total Mileage Amt.
1. Enter rate, miles, and amount being claimed at **equal to the IRS rate**.			0.00
2. Enter rate, miles, and amount being claimed at **less than the IRS rate**.			0.00
3. Enter rate, miles, and amount being claimed at **greater than the IRS rate**.			0.00
4. Add the total mileage amounts from lines 1 through 3.			0.00
5. Enter IRS mileage rate in place at the time of travel.			
6. Subtract line 5 from line 3.	0.000		
7. Enter total miles from line 3.		0	
8. Multiply line 6 by line 7. This is **taxable** mileage.			0.00 (Copy to Box C)
9. Subtract line 8 from line 4. If line 8 is zero, enter mileage amount from line 4. This is non-taxable mileage.			0.00 (Copy to Box D)

OTHER EXPENSES – See reverse for list of Earn Codes.

Date	Earn Code	Comments	Total
		Subtotal Other Expenses: (B)	0.00
		Total taxable mileage greater than IRS rate to be reimbursed: (C)	0.00 MIT or MOT
		Total nontaxable mileage less than or equal to IRS rate to be reimbursed: (D)	0.00 MLI or MLO
		Grand Total (A + B + C + D)	0.00
		Less Advance issued for this trip:	
		Total amount to be reimbursed to the employee:	0.00
		Amount of Advance to be returned by the employee by deduction from paycheck:	0.00

If using private vehicle for out-of-state travel: What is the lowest airfare to the destination? Total Expenses for this trip must not exceed this amount.

I declare, under penalty of perjury, that this claim is just, correct and that no part of it has been paid or reimbursed by the state of Minnesota or by another party except with respect to any advance amount paid for this trip. I AUTHORIZE PAYROLL DEDUCTION OF ANY SUCH ADVANCE. I have not accepted personal travel benefits.

Employee Signature ______________________________ Date ______________ Work Phone:

Approved: Based on knowledge of necessity for travel and expense and on compliance with all provisions of applicable travel regulations.

Supervisor Signature ______________________________ Date ____________ Work Phone:

Appointing Authority Designee (Needed for Recurring Advance and Special Expenses)

Signature ______________________________ Date ________________

EMPLOYEE EXPENSE REPORT (Instructions)

DO NOT PAY RELOCATION EXPENSES ON THIS FORM.
See form FI-00568 Relocation Expense Report. Relocation expenses must be sent to Minnesota Management & Budget, Statewide Payroll Services, for payment.

USE OF FORM: Use the form for the following purposes:
1. To reimburse employees for authorized travel expenses.
2. To request and pay all travel advances.
3. To request reimbursement for small cash purchases paid for by employees.

COMPLETION OF THE FORM: Employee: Complete, in ink, all parts of this form. If claiming reimbursement, enter actual amounts you paid, not to exceed the limits set in your bargaining agreement or compensation plan. If you do not know these limits, contact your agency's business expense contact. Employees must submit an expense report within 60 days of incurring any expense(s) or the reimbursement comes taxable.

All of the data you provide on this form is public information, except for your home address. You are not legally required to provide your home address, but the state of Minnesota cannot process certain mileage payments without it.

Description	Earn Code In State	Earn Code Out of State
Advance	ADI	ADO
Airfare	ARI	ARO
Baggage Handling	BGI	BGO
Car Rental	CRI	CRO
Clothing Allowance	CLA	
Clothing-Non Contract	CLN	
Communications - Other	COM	
Conference/Registration Fee	CFI	CFO
Department Head Expense	DHE	
Fax	FXI	FXO
Freight & Delivery (inbound)	FDS	
Hosting	HST	
Laundry	LDI	LDO
Lodging	LGI	LGO
Meals With Lodging	MWI	MWO
Meals Without Lodging	MEI*	MEO*

Description	Earn Code In State	Earn Code Out of State
Membership	MEM	
Mileage > IRS Rate	MIT*	MOT*
Mileage < or = IRS Rate	MLI	MLO
Network Services	NWK	
Other Expenses	OEI	OEO
Parking	PKI	PKO
Photocopies	CPI	CPO
Postal, Mail & Shipping Svcs.(outbound)	PMS	
Storage of State Property	STO	
Supplies/Materials/Parts	SMP	
Telephone, Business Use	BPI	BPO
Telephone, Personal Use	PHI	PHO
Training/Tuition Fee	TRG	
Taxi/Airport Shuttle	TXI	TXO
Vest Reimbursement	VST	
Note: * = taxable, taxed at supplemental rates		

Supervisor: Approve the correctness and necessity of this request in compliance with existing bargaining agreements or compensation plans and all other applicable rules and policies. Forward to the agency business expense contact person, who will then process the payments. Note: The expense report form must include original signatures.

Final Expense For This Trip?: Check this box if there will be no further expenses submitted for this trip. By doing this, any outstanding advance balance associated with this trip will be deducted from the next paycheck that is issued.

1-Way Commute Miles: Enter the number of miles from your home to your permanent workstation.

Expense Group ID: Entered by accounting or payroll office at the time of entering expenses. The Expense Group ID is a unique number that is system-assigned. It will be used to reference any advance payment or expense reimbursement associated with this trip.

Earn Code: Select an Earn Code from the list that describes the expenses for which you are requesting reimbursement. Be sure to select the code that correctly reflects whether the trip is in state or out-of-state. **Note**: Some expense reimbursements may be taxable.

Travel Advances, Short-Term and Recurring: An employee can only have one outstanding advance at a time. An advance must be settled before another advance can be issued.

Travel Advance Settlement: When the total expenses submitted are less than the advance amount or if the trip is cancelled, the employee will owe money to the state. Except for rare situations, personal checks will not be accepted for settlement of advances; a deduction will be taken from the employee's paycheck.

FMS ChartStrings: Funding source(s) for advance or expense(s)

Mileage: Use the **Mileage Reimbursement Calculation** table to figure your mileage reimbursement. Mileage may be authorized for reimbursement to the employee at one of three rates (referred to as the equal to, less than, or greater than rate). The rates are specified in the applicable bargaining agreement/compensation plan. Note: If the mileage rate you are using is above the IRS rate at the time of travel (this is not common), part of the mileage reimbursement will be taxed.

Vehicle Control #: If your agency assigns vehicle control numbers follow your agency's internal policy and procedure. Contact your agency's business expense contact for more information on the vehicle control number procedure.

Personal Travel Benefits: State employees and other officials cannot accept personal benefits resulting from travel on state business as their own. These benefits include frequent flyer miles/points and other benefits (i.e. discounts issued by lodging facilities.) Employees must certify that they have not accepted personal travel benefits when they apply for travel reimbursement.

Receipts: Attach itemized receipts for all expenses except meals, taxi services, baggage handling, and parking meters, to this reimbursement claim. The Agency Designee may, at its option, require attachment of meal receipts as well. Credit card receipts, bank drafts, or cancelled checks are not allowable receipts.

Copies and Distribution: Submit the original document for payment and retain a copy for your employee records.