SEPTEMBER 13TH, 2022

BENTON SWCD & NRCS TOUR

BENTON SOIL & WATER CONSERVATION DISTRICT

NRCS Natural Resources Conservation Service

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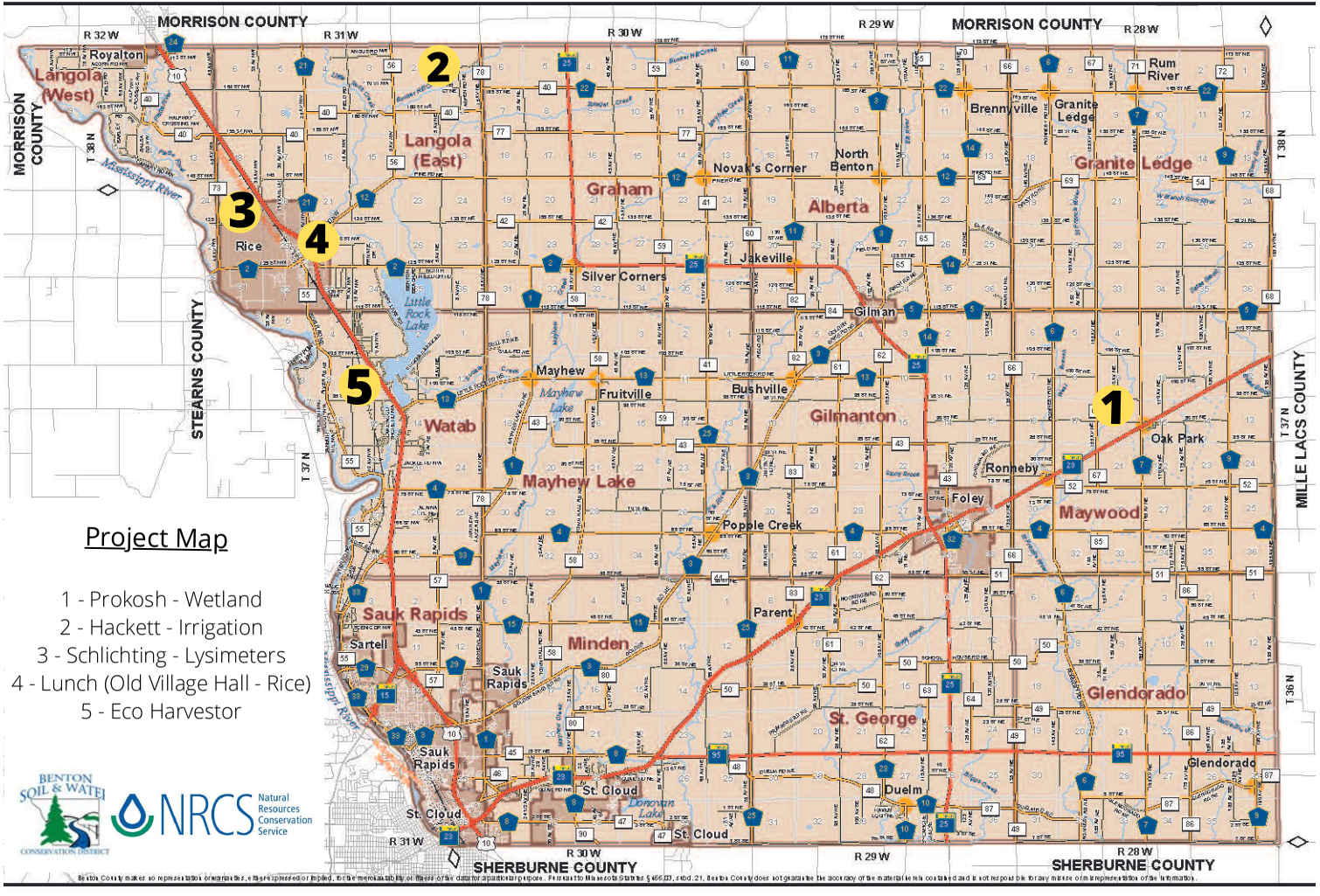


Project Map

1 - Prokosh - Wetland
2 - Hackett - Irrigation
3 - Schlichting - Lysimeters
4 - Lunch (Old Village Hall - Rice)
5 - Eco Harvestor

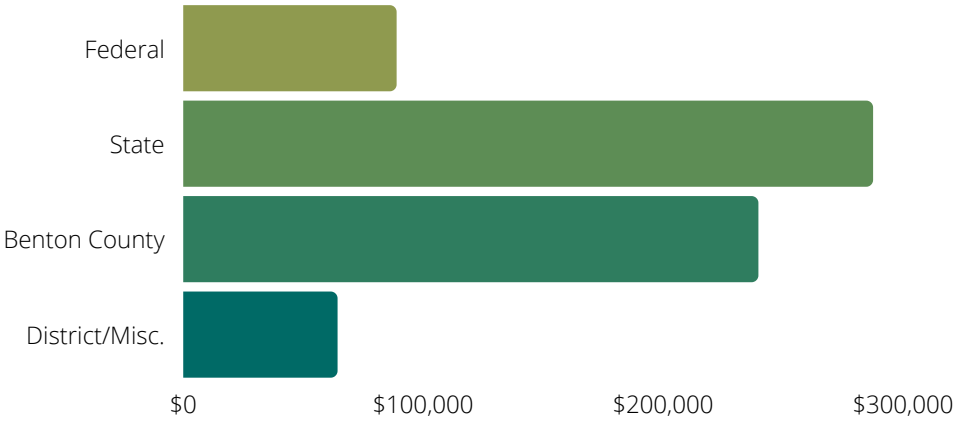
BENTON SOIL & WATER CONSERVATION DISTRICT

NRCS Natural Resources Conservation Service

OPERATIONAL REVENUE

$679,652

OPERATIONAL REVENUE IN 2021

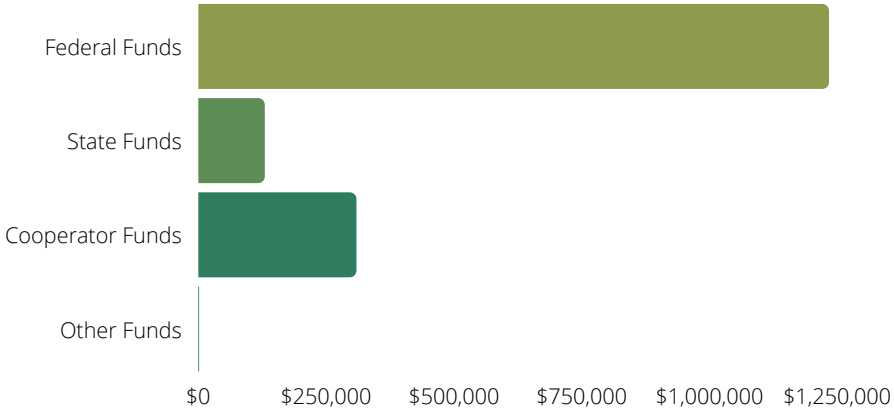


These funds are used for personnel salary and benefits, Supervisor and Water Resources Advisory Committee member expenses, rent, supplies, travel, tree program, environmental education programs and other related expenses.

FINANCIAL CONTRIBUTIONS FOR CONSERVATION PROJECTS

$1,674,650

IN CONTRIBUTIONS FOR CONSERVATION PROJECTS IN 2021



Funds administered through the SWCD, NRCS, FSA and Benton County Program. Landowner contributions for federal funded projects are not available so cooperator funds displayed are estimates.

PROKOSH WETLAND RESTORATION

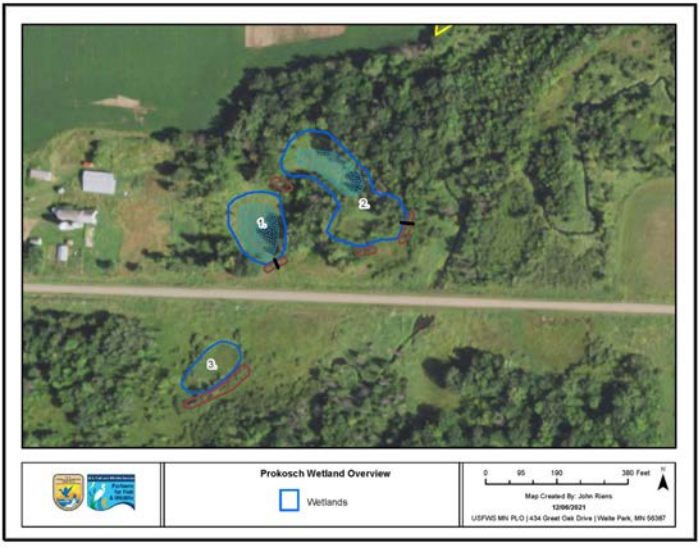
Paul Prokosch owns property northeast of Foley in the Elk River Watershed. A wetland restoration project was completed in the August 2022. This wetland restoration project had three berm structures installed to restore approximately 2.4 acres of drained and degraded wetland habitat. Two of the berms had pipe structures installed at the proper elevation and additional scraping of non-native cattails and reed canary took place in the pool area to create more open water. This project is part of a larger scale effort to combat non-native aquatic invasive species such as reed canary grass and hybrid cattails in Benton County. The reasons for this effort are to improve wildlife habitat, improve floodwater retention, filter nutrients, improve water quality and increase beneficial native wetland plant species. Additionally, this project will provide improved water quality, floodwater retention, groundwater recharge, carbon sequestration, and other biological services important to the public and USFWS's mission.

The project will reduce an estimated 49.9 pounds of nitrogen and 4.32 pounds of phosphorus. Partners in this effort include the U.S. Fish and Wildlife Service and Benton County Soil and Water Conservation District. Fish and Wildlife was the engineer and overseen construction for the project.

PROKOSH WETLAND RESTORATION

Objectives:

- Create 3 earthen dams and two ditch plugs to restore 3 wetland basins;
- Remove non-native hybrid cattail and reed canary grass to best extent practical;
- Prepare and plant native prairie habitat;
- Prepare and plant native woodland habitat; and
- Maintain habitats following installation.



BOSSHART WETLAND RESTORATION

Darryl Bosshart owns property north of Foley in the Elk River Watershed. A wetland restoration project was completed in the Fall of 2021. The wetland restoration project restored approximately 2.25 acres of drained seasonal wetland habitat. There will be 6.5 acres of upland prairie that is enrolled into Conservation Reserve Program (CRP) and planted around the wetland basin in the spring of 2023. This project is part of a larger scale effort to combat non-native aquatic invasive species such as reed canary grass and hybrid cattails in Benton County. The reasons for this effort are to improve wildlife habitat, improve floodwater retention, filter nutrients, improve water quality and increase beneficial native wetland plant species. A berm and emergency spillway was installed to the proper pool elevation for the project. Additional scraping of non-native cattails and reed canary took place in the pool area to create more open water. The project will reduce an estimated 0.435 tons of sediment and 0.11 pounds of phosphorus. Partners in this effort include the U.S. Fish and Wildlife Service and Benton County Soil and Water Conservation District. Fish and Wildlife was the engineer and overseen construction for the project.

Before

BOSSHART WETLAND RESTORATION


After

Objectives:

- Create one earthen berm with spillway to updated standards
- Conduct one scrape to restore historical wetland profile
- Plant native wetland seed following construction
- Plant Upland Buffer following construction through CRP; and
- Manage the habitats following installation.

CZECH OUTSTANDING CONSERVATIONIST

1st fall after installation

Mark and Shelley have been selected by the Benton Soil and Water Conservation District as the 2022 Outstanding Conservation Cooperators. The Czechs milk 590 cows and farm 5,400 acres with a corn/ corn silage, alfalfa, wheat rotation.

The following are some of the practices they have implemented over the years.

- 2007 – *Manure Pit Closure, 1.3 acres of headland planting and 1,040' of windbreak*

- 2010 – *Environmental Quality Assessment Completed*

- 2011 – *Conservation Stewardship Program (CSP) which included nitrogen stabilizers on commercial fertilizer, low drift nozzles, lower boom heights and lower pressure to reduce pesticide drift, plant tissue sampling to improve nitrogen management and harvesting hay in a wildlife friendly manner.*

Water and Sediment Basin installed in 2017

Pouring the floor for the manure pit

- 2016 – *Re-enrolled in CSP*

- 2016 - *Comprehensive Nutrient Management Plan Completed*

- 2017 – *Installed a Water and Sediment Basin through the EQIP and CWF Programs*

- 2020 – *Installed a 234' x 398'x 14' manure pit to hold 6.1 million gallons of manure and feedlot runoff for 14 months.*

- *Reduced the intensity of tillage each year by changing over to vertical tillage and eliminate the chisel plow.*

SCHYMA COVER CROPS

Bob and Brenden Schyma inter-seeded the cover crops into corn with the urea the first part of July. Their goal is to use the cover crops as green manure on the acres that will not receive cow manure this year. The mix included oats, crimson clover, radish, kale and forage soybeans. Once the corn starts to dry down and the canopy opens ups the cover crops should take off.

Above: map of planting
Right and below: oats and radish starting to pop up

MOULZOLF EROSION CONTROL

Bill came in the office in 2019 interested in fixing some erosion issues on a couple of his fields. On the north end of the field, after years of farming the field was lower than the road ditch forcing the water to run along the field edge for it was cut across the field from SE to NW. The south side of the field had a terrace installed in the late fifties or early sixties that was starting to fail. There were several spots where the terraces had over topped and gullies forming below the terrace. In 2020 the south terrace was rebuilt to todays standard and now outlets to a waterway on the west side on the field. A new terrace was installed on the north side of the field that outlets to the reshaped road ditch that flows to the north.

Plan

Aerial View

MOULZOLF EROSION CONTROL

Funding was provided by Federal EQIP Program, Clean Water Legacy Program and Benton SWCD. Pollution reductions include 267 tons of sediment year, 294 tons of soil per year and 227 lbs. of phosphorus per year.

above: After Water way/road ditch running north along 65th Ave

right: Before Waterway/road ditch running north along 65th Ave

below: South Terrace installed

SCHEEL ENERGY AUDIT

The Farmstead Energy Improvement practice is applied as part of a conservation management system to reduce energy use. The practice entails developing and implementing farmstead improvements to increase energy efficiency measures which reduce on-farm energy use. Improvements may include replacing or retrofitting agricultural equipment systems and/or related components or devices.

Kevin had an Energy Audit completed on his farm to provide opportunities to improve efficiency and decrease energy costs. Below is an example table of what was found and what changes can be made.

Variable Speed Drive Vacuum Pump

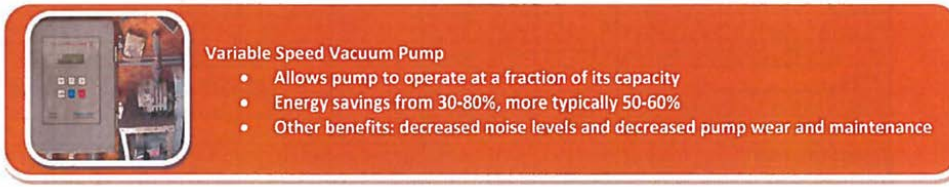


Table 16: Variable speed vacuum pump savings summary

Measure	Annual Savings	Project Cost	Payback (years)	kWh Savings	kW Savings	MMBtu Savings	% Savings	Equipment Life
Variable Speed Vacuum Pump	$2,051	$8,000	3.9	17,093	**8.51**	58.3	67%	15+ years

The farm should consider installing a variable speed drive on the vacuum pump. A variable speed or variable frequency drive (VFD) control unit will operate the speed of the motor and pump according to the vacuum need of the system often around 60% of the full capacity. It should be noted that your current pumps are vane style pumps. Some installers require VFD's to be installed on blower style pumps only. However, there have been several farms that have maintained their current vane style pumps without failure for several years. In the case of Scheel Dairy, it is recommended to replace both existing vacuum pumps with a new 3-phase, 10 HP blower style vacuum pump and install a VFD on the new vacuum pump system. While the farm doesn't have 3 phase power, the VFD control can be built with an inverter to change the power from single to 3-phase. A VFD on the vacuum pump is estimated to save the farm $2,051 (17,093 kWh) annually.

Kevin has also worked with EQIP to improve efficiencies with his irrigation system south of the farm. He has installed moisture sensors and completed 2 years of Irrigation Water Management, with the goal of significantly reduced water consumption on about 80 acres.

JAMES WOLLAK MAWQCP RCPP

James Wollak has committed to keeping his father Allan Wollak's conservation minded farming operation moving forward. Allan certified his farm several years ago through the Minnesota Agricultural Water Quality Certification Program sponsored by the Minnesota Department of Agriculture. Recently, James has since taken over the ownership and daily operation of the farm with Allan as a mentor and work collaborator.

James knew the value of having the conservation practices of crop rotation, perennial vegetative buffers along Zuleger Creek, and nutrient and irrigation water management. With having that knowledge and value instilled in him, James chose to certify the farm under his operation and continue the MN Ag Water Quality Certification through the next generation on this family farm.

The corn soybean crop rotation includes reduced tillage and maintains a higher level of crop residue over the winter. Nutrient management is maintained by performing a manure spreader calibration for the on-farm poultry manure along with routine soil sampling for a higher level of nitrogen and phosphorus applications.

James' nutrient management efforts are being advanced with a Comprehensive Nutrient Management Plan that is reviewing manure storage options.

HACKETT IRRIGATION

The Hackett's (Mel and Darlene, Spencer and Stacey) have installed several conservation practices in the past few years, but the most notable for Irrigation Water Management is one of the conventional center pivots they replaced in the spring of 2020 with assistance from the Environmental Quality Incentive Program (EQIP). To the best of our knowledge this was the first variable rate irrigation (VRI) system of its kind installed in the nation.

To understand the importance of variable rate, especially for this field, a brief look at the soils is helpful. The United States Department of Agriculture (USDA) has a rating system that classifies soils based on their drainage, which ranges from "very poorly drained" to "excessively drained". In this irrigated field there are soils from both ends of the drainage class, with parts of the field that are under the pivot having standing water most of the growing season to sandy soils that are susceptible to drought, and soils in between. Much of the field is excessively drained.

VRI allows them to use a "prescription" to apply varying amounts of water to different parts of the field. Under the old conventional center pivot, the wet areas received the same amount of irrigation water as the dry areas. The result is either the dry areas were underwatered, the wet areas were overwatered, or both. With the new system the overall amount of water used is reduced and it's applied in a more productive pattern.

Despite not having the 2022 growing season data, Hackett's are seeing water savings. In addition to the water savings, Hackett's are also seeing a reduction in energy use. This is partly due to the reduced water usage, and partly due to other changes. When the new irrigation system was installed, they also replaced the old diesel-powered irrigation pump with a new electric pump with a variable frequency drive to reduce energy consumption.

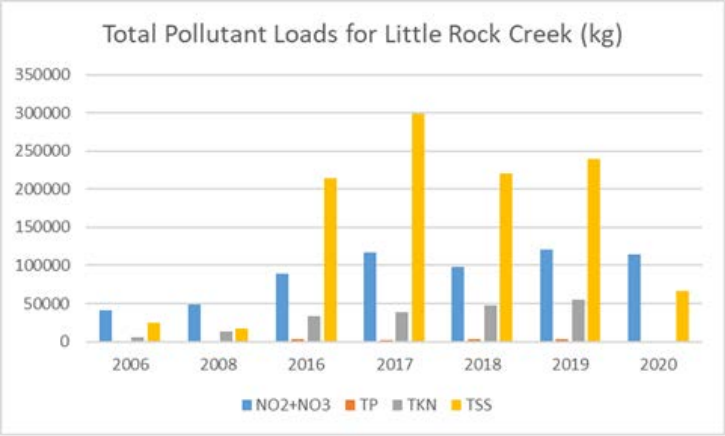
The picture below shows how the water is applied under the new system. Each color represents a percentage of the full application rate. For example, if 1" of water is needed, the dark blue areas would receive an inch of water, light blue 0.7", green 0.5" to 0.6", lime 0.4", orange 0.3", dark orange 0.2", and red 0.05".

WATER MONITORING

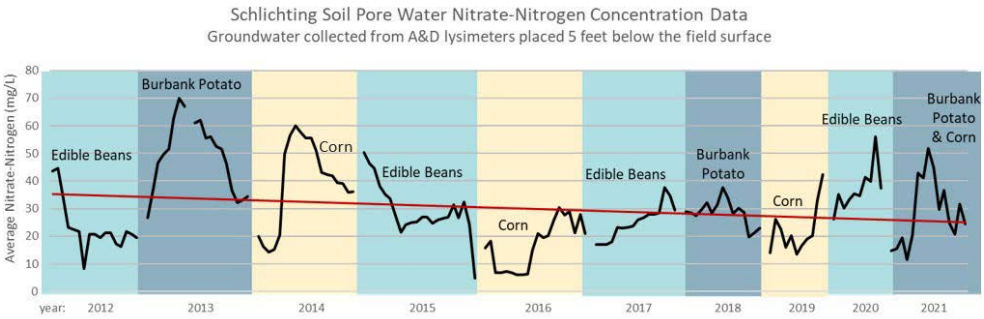
Water is essential in Minnesota. Not only the quantity but the quality. Therefore, the Minnesota Pollution Control Agency (MPCA), Minnesota DNR and Benton SWCD put funds together for stream monitoring in Benton County. The main objective is to assess the lake and stream's health and determine what actions are necessary for restoration or protection. Though the initial grant funds are no longer available the outcome of the partnerships between the agencies continued. Local groups such as the Sauk Rapids and Rice Sportsman's Club have donated funds recently to assist in the longevity of data collection. Benton SWCD monitors at a reach of Sucker Creek, Bunker Hill, and Little Rock Creek.

District staff are conducting the field work and MPCA staff analyze the data. During the season water samples are taken after a rain event and/ or on a 15-day schedule. The samples are collected in a bottle and shipped to a licensed laboratory to test for phosphorus levels, nitrates, total suspended solids, and a few more parameters. Benton SWCD staff will also complete a stream assessment on site using a Sonde and secchi tube. The Sonde is placed in the water and takes live readings of dissolved oxygen, water temperature, pH, and specific conductance. A visual assessment for the stream suitability and height is determined as well. The secchi tube depicts the water clarity. All this data is collected, compiled, and reviewed by MPCA and creates a report.

Pollutant Load Levels and Total Suspended Solids have been decreasing over the last several years. It is important to continue the monitoring of these locations because they have been pivotal with understanding how the watershed upstream are reacting to any land use or conservation practices. It also shows how the streams may be impacting Little Rock Lake in which the streams outlet into.



SCHLICHTING LYSIMETERS



The Schlichting Farms partnered with the Minnesota Department of Agriculture (MDA) and the Benton Soil and Water Conservation District (SWCD) in 2011 for the installation of 12 Suction Lysimeters which holds water for nitrate analysis. Nitrates move through the soil profile and could potentially leach into groundwater. There was a fall 2021 expansion with updates and install of new to total 16 functioning lysimeters in two additional dug trenches with 3 feet depths.

They have a crop rotation of edible beans, potatoes, and corn. The Schlichting Farms have been utilizing cover crops in their rotation since the 1970's. Water samples are collected bi-weekly and analyzed for nitrate levels by the Benton SWCD staff. Water samples are collected during the growing season which can vary in length from year to year. Typically, it begins in May and ends around freeze up in early November. This demonstration site shows how nitrate levels may leach through the soil profile in real farm applications. There is a declining trend between 2012 and the present. In 2015 and 2016 there was an increase in crop yield and may have contributed to more efficient nitrogen usage.

ECO HARVESTOR

The Eco harvester was purchased with a grant from Benton County AIS Task Force funds. The machine and trailer were just over $100,000.00 to purchase. Another grant of up to $ 10,000.00 was approved for the first year operating expenses.

These grants are a 10 percent match by the Little Rock Lake Association.

The machine will be used primarily to remove Curly Leaf Pond weed from infested areas of the lake. A yearly DNR permit is required which specified which areas of the lake may be harvested.

Removing the Curly Leaf, which is an invasive species, allows the growth of more native plants.

RUM RIVER RIM

The Rum River watershed covers 1,013,760 acres of the Upper Mississippi River Basin, flowing 151 miles from Lake Mille Lacs in the north to the confluence with the Mississippi River in the City of Anoka. The watershed covers large portions of Aitkin, Mille Lacs, Isanti, and Anoka Counties and covers smaller areas of Crow Wing, Morrison, Benton, Kanabec, Chisago, and Sherburne counties as well as portions of the Mille Lacs Band of Ojibwe's Reservation.

The Rum River is one of seven State Scenic and Recreational rivers, a State Outstanding Resource Value Water, and a State Water Trail. The river is home to countless aquatic species that depend on the river's habitat. The river supports local fishing guides, canoeing, and camping businesses.

The Rum River is also an important drinking water source for millions of Minnesotans. It empties into the Mississippi River just upstream of drinking water intakes for the Twin Cities.

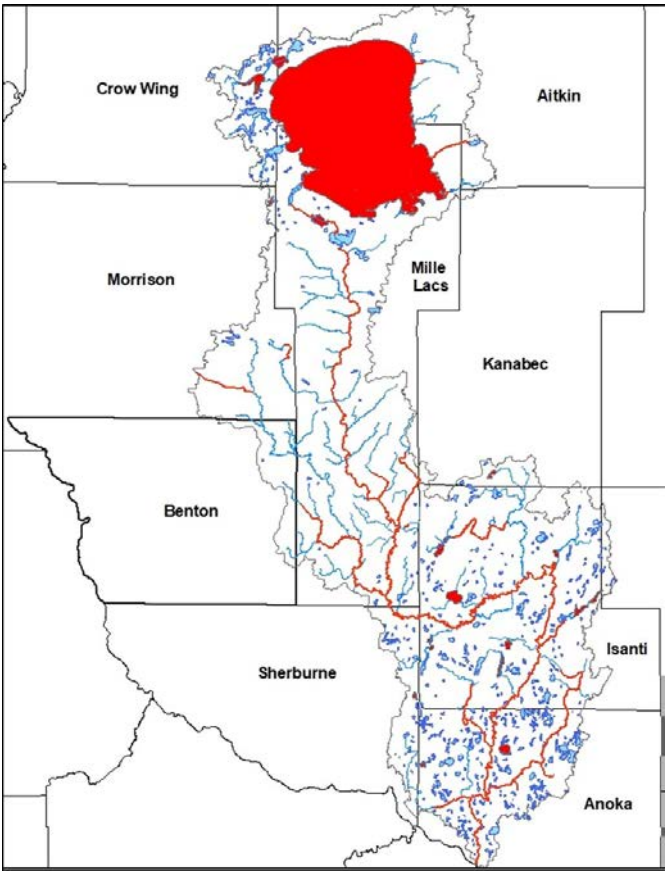
In 2020 the Minnesota Legislature approved $3 million for ReInvest in Minnesota (RIM) to make permanent conservation easements an option for willing landowners within the nine-county watershed which includes a small portion of Benton County.

The first $3 million was encumbered in about a year and in 2021 the Minnesota Legislature approved an additional $2.5 million for RIM easements in the Rum River Watershed.

A conservation easement is a voluntary and legally binding agreement between the landowner, and the Minnesota Board of Water and Soil Resources. It limits the use and development of the land in order to preserve your land's unique natural features that have important water quality and wildlife habitat value.

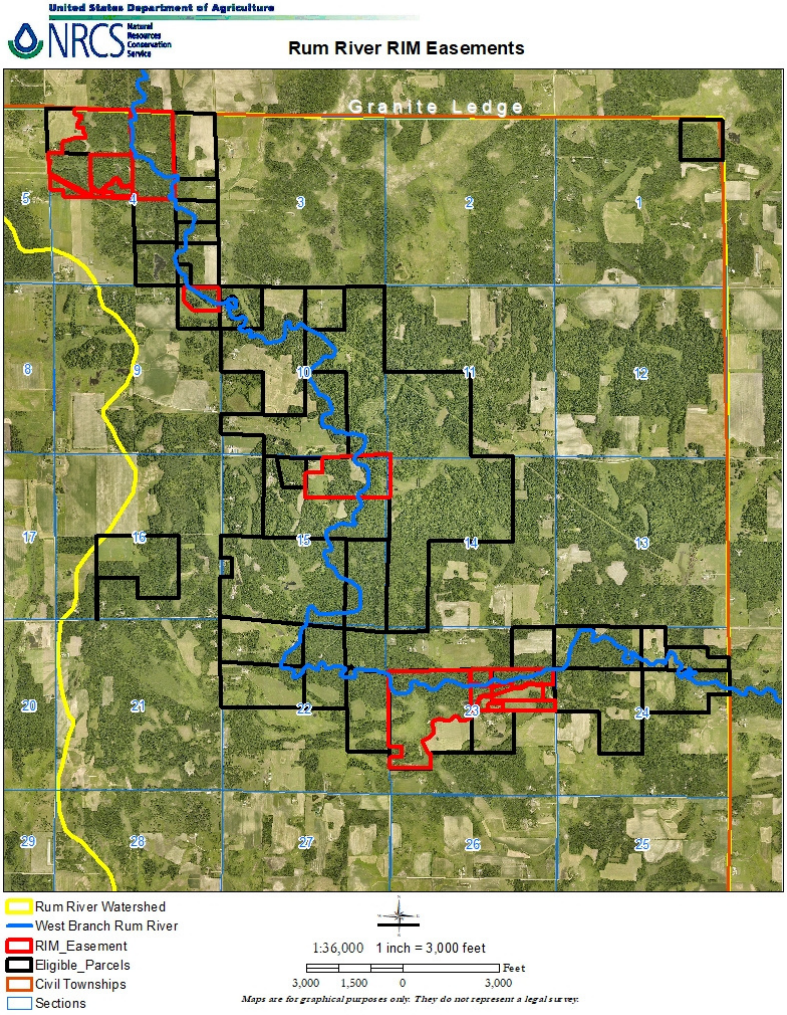
In Benton County there was a total of 33 landowners that were identified along the West Branch Rum River, which was identified as a high priority tributary to the Rum River, that were eligible for the RIM program. Currently, Benton County has 8 approved easements which protects a total of 513.2 acres and 6.35 miles of shoreline. There is a total of $504,963.31 allocated to the 8 landowners who enrolled into the program.

RUM RIVER RIM



RUM RIVER RIM

8 easements
513.2 acres
6.35 miles of shoreline
$504,963.31 allocated



ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP)

EQIP provides federal conservation program funds to address local resource concerns. The program provides financial assistance, either to off-set the cost of implementation or as an incentive, to assist crop, livestock, and other operations.

$1.03M

IN CONTRACTS IN 2021

8

CONTRACTS IN BENTON COUNTY FOR 2021

EQIP Highlights of 2021

- 620 acres of nutrient management practices
- 1 well sealing
- 4 slacking slab projects
- 302 ft. of windbreaks installed
- 22 acres of pasture seeding
- 1 stream crossing project
- 1 seasonal high tunnel project

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS TECHNICAL ASSISTANCE GRANT

Benton SWCD was awarded funding again from the National Association of Conservation Districts (NACD) Technical Assistance Grant.

We use these funds to focus on Conservation Operations Technical Assistance (COTA) Planning.

Farmers and agricultural landowners in Benton County have shown a very high interest in conservation, especially over the last several years. Benton SWCD technicians are able to conduct one on one consultations and planning with these landowners through this grant.

NACD Highlights for 2020-2021

- 50 landowners assisted
- 27 Conservation Plans
- 37 EQIP contracts assisted
  - 10 designs
  - 2 funded contracts
  - 1 installed contract
  - 1 certified practice
  - one historically underserved producer with 332.3 acres

2781.5 TOTAL ACRES

BENEFITTED IN BENTON COUNTY 2020-2021

$55,000

AWARDED TO BENTON SWCD FOR 2021-2022

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Conservation Reserve Program (CRP) and The Continuous Conservation Reserve Program (CCRP)

CRP aims to re-establish valuable land cover to help improve water quality, prevent soil erosion and reduce loss of wildlife habitat. It's become one of the largest private-lands conservation programs in the U.S.

10

CRP CONTRACTS IN BENTON COUNTY IN 2021

137.82

ACRES ENROLLED IN CRP 2021

$191,264

PAID TO LANDOWNERS IN CRP IN 2021

CCRP is a voluntary program that focuses on using grasses and trees to protect and improve soil, air, water, and enhance fish and wildlife habitat using various conservation practices.

114.67

ACRES ENROLLED IN CCRP 2021

16

CCRP CONTRACTS IN BENTON COUNTY IN 2021

Minnesota Agriculture Water Quality Certification (MAWQCP)

A voluntary program for farmers and landowners that protects Minnesota's water resources. MAWQCP recognizes producers for their work in protecting water quality. It puts farmers in touch with local conservation district experts to identify and mitigate any risks their farm poses to water quality.

Once certified, each farm is deemed in compliance with water quality laws and regulations for 10 years. Farmers can use their certification status to promote and market their operations as protective of water quality.

9,562

ACRES CERTIFIED N BENTON COUNTY SINCE PROGRAM INCEPTION

13

FARM CERTIFIED IN BENTON COUNTY SINCE PROJECT INCEPTION

Highlights of 2021

- 1 Farm certified with a total of 904 acres
- 3 farm assessments in progress
- West Central Area (our area) is at 251 farms certified on 176,831 acres of the 800,915 acres Statewide.

Clean Water Fund
Well Sealing Program

This program is funded under the Clean Water Fund. The goal is to seal unused, abandoned wells in Benton County to protect groundwater quality, human health, and safety.

An unused well is an open access point straight to our groundwater, allowing surface water runoff, contaminated water, pollutants, or any waste material a direct link to our drinking water sources. This threatens the quality and safety of everyone's water – neighbor's water, your water, and even surrounding water.

Additional funding coming in 2022.

6 WELLS

SEALED IN 2021

CLEAN WATER LAND & LEGACY AMENDMENT

Clean Water Fund
Septic System Upgrade Program

The MPCA offer grants to counties for SSTS programs and to assist low-income homeowners with needed SSTS upgrades. The SSTS base grant is $18,600 per county for counties that administer the SSTS program.

In 2021, there was a total of $1.5 million available to counties. Funds distributed to counties through the Board of Water and Soil Resources (BWSR) Natural Resources Block Grants (NRBG).

Additional funding coming in 2022.

$26,796
AWARDED TO BENTON COUNTY IN 2019 TO 2022.

2 SEPTIC SYSTEMS
FIXED IN 2021

CLEAN WATER LAND & LEGACY AMENDMENT

Elk River Watershed
Grant Program Highlight

Benton SWCD has installed 36 BMPs since 2016 in this watershed with 2 Clean Water Fund grants totaling $500,000. This 613-square-mile watershed spans across Benton and Sherburne county.

This grant will aid in reducing the frequency and severity of the algae blooms and enhance aquatic life and recreation for users of both Mayhew Lake and Big Elk Lake. Recent monitoring data shows decreasing trends in bacteria levels, phosphorous and chlorophyll-a levels. More data results coming in 2022-2023.

The 2020 Big Elk & Mayhew Lakes Phosphorus Reduction Program grant of $350,000, helped complete projects in 2020 and 2021.

Another grant was awarded in late 2021 to contiune this work.

2021 HIGHLIGHTS

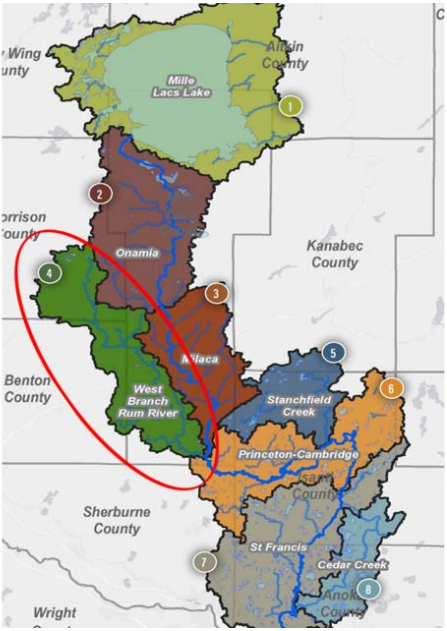
6 wetland restorations (35.75 acres)
7 cover crop projects
1 terrace
1 septic system repair
1 water and sediment basin

$65,835
COST SHARE IN 2021

554 LBS
PHOSPHOROUS POLLUTION REDUCED

503 TONS
SEDIMENT POLLUTION REDUCED

Rum River Watershed "One Watershed One Plan"



Where could we see some funding and projects

- Wetland restorations
- Forest restoration and management
- Ag BMPS (cover crops, erosion prevention, conservation tillage)
- Land easements
- Outreach Activities
- Type A: Outreach and engagement which supports raising awareness and behavioral change
- Type B: Outreach and engagement which supports community organizing and community buy-in
- Type C: Outreach and engagement which supports technical assistance and project development

Benton SWCD Chairperson Joe Jordan signing the resolution to adopt the Rum River plan on June 22, 2022.

THANK YOU FOR ATTENDING THE 2022 TOUR OF PRACTICES!

SWCD Staff

left to right

Gerry Maciej
Nathan Sanoski
Mike McMillin
Jessica Hoheisel
Kendra Sommerfeld
Renee Thell

NRCS Staff

left to right

Bonnie Haubenschild

Joey LeBlanc

Josh Bork

SWCD Supervisors

left to right

Wade Bastian
Joe Jordan
Bernie Thole
Jake Sherer
Chuck Rau

"Our mission is to protect and enhance Benton County's soil, water & other natural resources; to nurture a conservation ethic by educating county residents on conservation & environmental issues."

Benton Soil & Water Conservation District
Natural Resources Conservation Service
14 2nd Avenue West
Foley, MN 56329
(320) 968-5300 Ext. 3
www.soilandwater.org

BENTON SOIL & WATER CONSERVATION DISTRICT

NRCS Natural Resources Conservation Service

Serving Benton County since 1948

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