



2021 ANNUAL REPORT

CARLTON COUNTY SOIL & WATER CONSERVATION DISTRICT

*Assisting landowners in protecting and enhancing the natural
resources of Carlton County*

Executive Summary

By Brad Matlack, SWCD Manager

2021 was another eventful year with changes in staff and the board, and successful implementation of existing programs along with addition of a couple new ones.

In September Russ Kurhajetz resigned as Supervisor from District 2, Esko area. Russ was the chair in 2021, served on the State Association of SWCDs representing the NE Region 3, and active on several SWCD committees including the SWCDs Legislative Committee making trips to the Capitol and working on Carlton SWCD and statewide SWCD issues.

Although the actual date was early January, the SWCD celebrated the impactful career of Kelly Smith as he retired from the SWCD after 27 years of dedicated service. Think back to 1995 and all that has happened since then. That is the same timeline Kelly worked for soil and water conservation with landowners, agencies, and local and state government officials. Although many changes in programs and people have come and gone, Kelly's work leaves a lasting legacy of trees planted, gullies fixed, and the soil and water resources of Carlton County in better condition.

In July, the SWCD hired Sam Horner as a new Conservation Technician. Sam comes from an environmental education work background serving as an educator at the Laurentian Environmental Center. He is working primarily with ag landowners on conservation projects and helping implement 2 new SWCD conservation initiatives.

One of those new initiatives is a national wildfire program called FireWise. This program helps homeowners make their property more resilient to wild fire through proven strategies to reduce wildfire fuels near buildings and make them more defensible in a 30 foot radius. There is dramatic video evidence of the effectiveness of these strategies from the 2021 Greenwood fire in Lake County.

The other new initiative is using biochar production to generate useful products from undervalued, and high volume woody biomass. This biomass is a product of many conservation practices from forest stand thinning and woody invasive species removal to fuel reduction work done through FireWise and managing brush in several conservation practices for grazing and wildlife. It is burned in a controlled environment to a point before ash, and then quenched with water. The resulting charcoal type product has great moisture holding capacity and is being studied for use in livestock bedding, livestock feed, as a soil amendment, and water filtering of some pollutants in certain cases.



After a year off in 2020, The SWCD returned to recognizing and highlighting the Conservation efforts of our clients. Although there was no local event this year, the SWCDs Outstanding Conservationists were recognized at the MASWCD state convention. Burnell Peterson and Ann Carlander were recognized for their work in forestry and pollinator habitat, but their conservation ethic is in evidence in many parts of their property near Wrenshall.

They are pictured here with Kelly Smith who assisted them in many of their conservation projects and Board members Barb Dahl and Bob Fox.

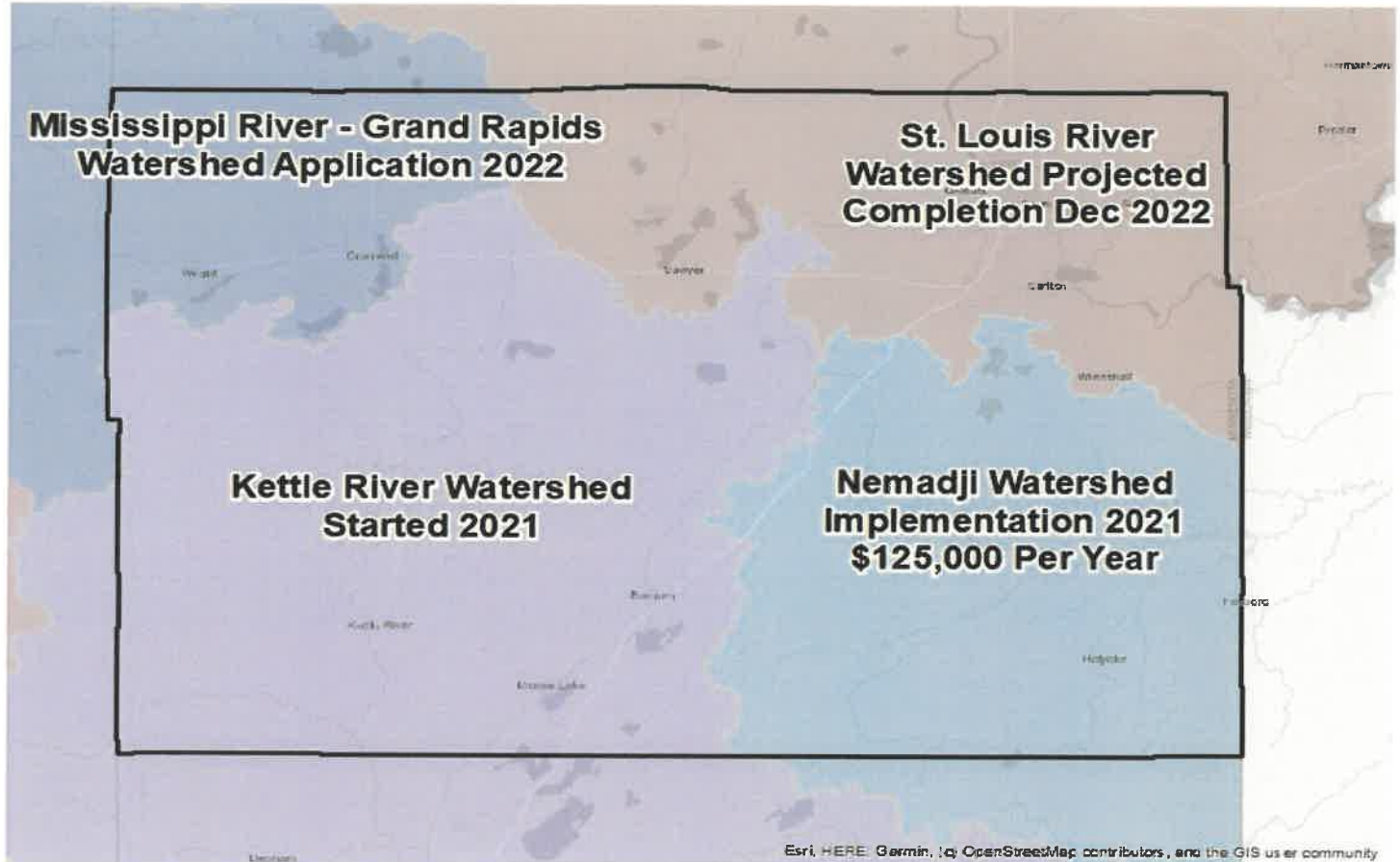
The Carlton SWCD is involved with conservation work in four topic areas detailed in the 2020 Strategic Plan. Through planning projects and implementing practices in Forestry, Agriculture, Urban, and Watersheds, the SWCD assists mostly private landowners to protect and enhance the natural resources on their properties. In 2021 the SWCD implemented a new database to track all aspects of this work. From time keeping, to project tracking and outreach results, the database helps organize all aspects of SWCD technical operation. This 2021 report highlights the SWCD programs in numbers and factsheet style details of a sampling of projects and programs.



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2021 WATER PLANNING STATUS



Water Planning History in MN

Since its enactment in 1985, the Comprehensive Local Water Management Act has standardized water resource planning in Counties throughout MN. Statute 103B allows counties to develop and implement comprehensive local water management plans (county water plans).

In 2015 the legislature revised 103B to include 103B.801 Comprehensive Watershed Management Planning Program. This developed a process to shift local water management planning from a county boundary to a watershed boundary known as One Watershed One Plan or 1W1P.

In Carlton County

In 2016 the SWCD accepted delegation as the water planning entity for Carlton County. The map above provides a status of each of Carlton County's 4 Major Watersheds in the 1W1P process. Assistant Manager for Water Resources Melanie Bomier, is the primary SWCD staff leading the Carlton County water planning effort. Carlton County Environmental Services is also very engaged in this work.



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2021 EQUIPMENT RENTAL PROGRAM

Program Details:

2021 saw many uses for our no-till drill. Interseeding new species into existing hay fields and pasture, cover crops drilled after corn harvest, and even one case where a farmer used it to no-till drill his soybean crop. We were able to replace the tires on the drill and replace the damaged rings on the brillion. We continue to hear from farmers that they appreciate the program, and they are grateful the SWCD was able to take on administering the rental program from the Extension office. Many of these farmers would not be able to complete these conservation practices without the assistance of our rental program. We have learned much in 2 years on proper use and settings of both seeders.

"Carlton SWCD staff was easy to work with. I am very happy that we have to opportunity to continue the Rental Program!"
~Local Farmer



Acres Seeded		Pollution Reduction	
Drill	414	Sediment Reduction (TSS) T/Yr: 22.67	
Brillion	129	Soil Savings T/Yr: 89.01	
TOTAL	543	Phosphorus Reduction Lbs/Yr: 50.55	
		Income (+)	
		Total Net Revenue	\$6330
		Expenses (-)	
		Tool Set/ Repairs	\$930.00

Benefits of Cover Crops and No-till

Reduce wind and water erosion	Add organic matter and nutrients to soil
Improve diversity in crop rotation	Absorb excess moisture, and mitigate soil compaction
Improve water infiltration through the soil	Provide a food source for livestock, wildlife, and pollinators
Scavenge nutrients in the soil to carry over to the next crop	Control weeds



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2021 Native Plant Kit Sale

Program Details:

Program Details: Carlton SWCD's second annual native plant kit sale took place in June and was the largest sale in Minnesota! 131 land occupiers purchased 218 native plant kits and 51 native seed mixes to do voluntary conservation across the region. Customers came from Carlton County, Pine City, Two Harbors, Superior, Wisconsin, and even further! Several local businesses participated in our sale including Carlton County, The Pine Knot, Jay Cooke State Park, Northeastern MN Bee Keepers Association, Oldenburg Arts and Cultural Community, Carlton County 4-H Club, several CSA farms and the Fond du Lac Reservation. We also had many landowners from last years sale purchase more kits. Xerces Society donated 50 signs to give away to the first 50 customers that ordered. We were already getting asked if we would have a sale in 2022! In 2022, we are offering 2 additional kits: Buckthorn Replacement and Shoreline Stabilization along with 2 seed mixes: Bee Lawn and Buckthorn Replacement.



Partners!

- Pine Knot News
- NE MN Bee Association
- Xerces Society
- U of MN Extension
- Duluth Collaborative Invasive Species Management Area
- MN DNR
- Oldenburg Arts and Cultural Community
- MN Department of Agriculture
- Local community flyers
- U of MN Master Gardeners
- Wild Ones
- City of Superior
- South St. Louis SWCD
- Pine SWCD... and many more!
- And many more...



Expenses (-)

Staff Time	\$1,162.56
Plant Kits, Seed Mix,	\$11,805.00
MN Sales Tax	\$1,172.49
Signs/Ads	\$383.65

Income (+)

Income From Sales	\$17,008.66
Total Net Revenue	\$2,484.96



Native Plant Kits Offered

Pollinator-81 Kits	Monarch- 32 Kits
Songbird- 15 Kits	Deer Resistant- 23 Kits
Raingarden- 20 Kits	Shady- 33 Kits
Pine Mulch- 14 Kits	Total: 218 Kits!

Native Seed Mixes Offered

Pollinator-25 Mixes	Monarch- 9 Mixes
Songbird- 17 Mixes	Total- 51Mixes

The Benefits of Native Plantings

30 acres of pollinator habitat! *About 23 football fields*	Educational for families, schools, churches, and the community
Habitat for many species, including endangered pollinators	Deep root systems (up to 15' deep) promote infiltration of stormwater runoff
Connectivity of pollinator corridors and habitat throughout the region and state of MN	14 acre feet runoff reduction 20 lbs. Phosphorus saved
Low maintenance, no fertilizing, no pesticides, turf conversion	Native plants compete with invasive weeds, like Tansy!



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2021 Firewise Program

Program Details:

The Minnesota Firewise Program was launched in Carlton County in July, 2021. This program aims to help landowners identify strategies to help increase their wildfire resiliency around their home and on their property. The process includes working with landowners to provide an on-site Residential Hazard Assessment for their property and to then follow up with a package of documents to guide the landowner towards installing mitigation measures. In the program's first year, the main focus was to highlight the 30' defensible space around the home and any accessibility issues related to the property.

"In my younger days, I would just rebuild my house if it burned down. Now I would rather find ways to keep my home safe from wildfire." – Local Landowner



First Year's Accomplishments

10 Firewise Evaluations Completed	10 Mitigation Plans Delivered to Landowners
25 Buildings Evaluated for Defensible Space	Mitigation Measures will be Determined in the Spring
1 Chipping Day RFB was Developed and Distributed	10 Residential Hazard Assessments Sent to DNR

Benefits of Firewise Evaluations

Reduced Wildfire Danger for the Community	Increased Wildfire Resiliency for Homes and Properties
Reduced Fuel Loads and Ladder Fuels	Low Cost Mitigation Measures are Identified
Increased Accessibility for Emergency Crews	Increased Awareness about Wildfires

Firewise Partners

CC Land Department, CC Emergency Management, CC Board, Carlton FD, MN DNR, Dovetail Partners, Chub Lake Association, FDL Firewise Coordinator, and More

"If I learn one way to keep my house safe from wildfires, then this day will have been a success." – Local Landowner



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2021 Biochar Initiative

Program Details:

The Carlton SWCD received funding support through the U of M Regional Sustainable Development Program to acquire a biochar kiln and demonstrate its use as a tool for landowners to utilize biomass (brush, tree limbs, and small logs) from conservation projects. The first kiln was built in late 2021 by students at the Cromwell High School Metals shop class. Using open source plans for an Oregon kiln, the students used this real life project as a learning project on metal fabrication. They are working on a second kiln with adaptations for better mobility around a landowners property.

SWCD staff is firing the kiln in several demonstration events to build our knowledge of operational procedures with the goal of assisting landowners in using a biochar kiln on their conservation projects.



Partners!

U of M Extension Regional
Sustainable Development
Program
Dovetail Partners
NRRI
Cromwell High School
Metals Class
City of Carlton
Carlton County
Land Department
Parks Department



The Benefits of Biochar

Increases water and nutrient holding capacity as a soil amendment

Filters runoff water of some contaminants

Reduces volume of low value biomass by around 80%

Flame cap kiln burning is cleaner than open pile burning

Kiln can be used for biomass handling from many conservation practices including: forest stand thinning, brush management for wildlife, silvopasture, woody invasive species management, wildfire fuels reduction.

Research is ongoing for use as livestock bedding to control ammonia and odors
Also researching as a livestock feed supplement for gut health

Kiln Costs

Metal for 2 Oregon kilns	\$ 1,090
Fabrication	Free by Cromwell HS
Mobility Enhancements	\$ 105
Total	\$ 1,195



Unlocking The Land's Potential

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Lawns 2 Legumes Pollinator Pocket

Who & Where:

Landowner: Ann Gustafson

Location: 176 Thomson Road Esko, MN 55733

Watershed: St. Louis River

Project Details:

Practice:

- Pollinator Pocket

Quantity: 500 sq. ft.

Completed: 6/29/2021

Resources Protected:

- St. Louis River

Project Description:

Ann and her family run Leaning Barn Farm. The pollinator pocket is planted by the parking lot for all customers to see and enjoy! These native species, some with up to 15' deep root systems, are excellent at infiltration of stormwater and pollutant runoff. They excel at keeping our water clean and our soil healthy. The above ground habitat is also an excellent food source for native bees, birds, and butterflies. This garden will also offer a place for family and friends to enjoy.

Benefit	Saved
Total Suspended Solids (lbs/yr)	57.92
Phosphorus Load (lbs/yr)	1.15

Before Photo



After Photo



Funding Overview

Total Cost	\$720.00
State	\$470.00
SWCD	\$0
Cooperator Labor (Match)	\$250.00

Project Output

180 Flower Species	Citizen Science Opportunities
Biodegradable Weed Suppression mat	Demonstration Plots
Minimize Runoff	Bloom and Color all growing season
Pollinator Habitat	Educational



Unlocking The Land's Potential

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Lawns 2 Legumes Pollinator Pocket

Who & Where:

Landowner: John and Dana Sanders

Location: 201 Boulder Dr. Cloquet, MN 55720

Watershed: St. Louis River

Project Details:

Practice:

- Pollinator Pocket

Quantity: 216 sq. ft.

Completed: 6/23/2021

Resources Protected:

- St. Louis River

Project Description:

The Sanders slowed their roof, driveway, and lawn storm water runoff that flows into a nearby ditch which eventually outlets into the St. Louis River by planting a raingarden. Their lawn had very little infiltration consisting of mostly Kentucky bluegrass which is a non-native species with a root system of only 3" deep. These native species, some with up to 15' deep root systems, are excellent at infiltration of stormwater and pollutant runoff. They excel at keeping our water clean and our soil healthy. The above ground habitat is also an excellent food source for native bees, birds, and butterflies. This garden will also offer a place for family and friends to enjoy.

Before Photo



After Photo



Funding Overview

<u>Total Cost</u>	<u>\$888.18</u>
State	\$ 313.18
SWCD	\$0
Cooperator/Match	\$575.00

Project Output

2 Raingarden Kits	Citizen Science Opportunities
Double Shredded Hardwood Mulch Used	Demonstration Plots
Minimize Runoff	Bloom and Color all growing season
Pollinator Habitat	Educational



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Native Shoreline Restoration

Who & Where:

Landowner: Chris Hedin

Location: 5544 Lippo Lane Cromwell, MN 55726

Watershed: Mississippi

Project Details:

Practice:

- Streambank and Shoreline Stab. & Native Shoreline

Quantity: 1,580 sq.ft Completed: 6/7/2021

Resources Protected:

- Lower Island Lake

Project Description:

Chris had a historic culvert that discharged into an 18" plastic corrugated pipe on his property that outleted into Lower Island lake. It failed and washed out surrounding areas. By removing the pipe and converting to a native vegetated swale and shoreline, Chris will decreased sediment loading while promoting shoreland stability with native, deep rooted species to enhance shoreline longevity and minimum maintenance.

Benefit	Saved
Total Suspended Solids (TSS) (Lbs/yr)	17.54
Nitrogen Load (Lbs/yr)	0.53
Phosphorus Load (lbs/yr)	0.37

Before Photo



After Photo



Funding Overview

Total Cost	\$7,094.50
State	\$0
Cromwell Stormwater	\$2,500
Cooperator	\$4,594.50

Project Output

Diverse mix of native grasses and flowers	Low Maintenance
Infiltration	Stabilize Shoreline
Reduce Sediment loading	Bloom and Color all growing season
Pollinator Habitat	Educational



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Cover Crop

Who & Where:

Landowner: Bruce and Laurie Heikes

Location: 3803 McDowell Road Holyoke, MN 55749

Watershed: Nemadji River

Project Details:

Practice:

Cover Crop

Quantity: 170 acres

Completed: 10/10/2021

Resources Protected:

Nemadji River

Project Description:

Bruce seeded winter rye into harvested corn stubble and worked up hay ground. He had been hesitant to try cover crops, but he finally decided to try doing Winter Cereal Rye. Cover crops, also known as soil armor, benefit the land by controlling wind and water erosion, slow evaporation rates, control soil temperatures, minimize compaction, suppress weed growth, build soil and provide habitat for the soil food web

Benefit	Saved
Soil Erosion (tons/yr)	11.9
Sediment Load (tons/yr)	4.59
Phosphorus Load (lbs/yr)	8.36

Before Photo



After Photo



Funding Overview

TOTAL COST	\$7,329.50
Federal	\$0
State	\$0
SWCD	\$5,497.13
Landowner	\$1,832.37

Project Output

Green cover on soil over winter season	
Add nutrients to soil	
Minimize erosion	
No till into harvested stubble	



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2021 Bley Road

Before



After



Program Details:

The undersized culvert on Bley Road was identified as a priority in a 2014 Culvert Inventory completed by the Carlton SWCD. A tanker car was installed as the culvert structure but was not long enough, resulting in excessive road erosion. In addition, the 8.5-foot structure was far undersized for the 22-foot wide (bankfull) stream, resulting in in-channel and bank erosion downstream of the culvert. This caused the culvert to be perched by at least 1 foot. During high flows, the stream velocity increased enough to cause severe downstream bank erosion.

The Carlton County Transportation Department worked with Holyoke Township to receive a DNR State Park Road Account Program grant to replace the undersized culvert with a free span bridge. The Carlton SWCD used Clean Water Funds to repair the downstream bank erosion.

Stream restoration features included:

- Reshaping the channel to make it narrower and more stable, allowing it to convey sediment while providing aquatic habitat
- Creation of approximately 60 feet of channel under new bridge
- Bankfull benches on each side of the stream
- Realignment of the channel to move stream away from steep, eroding banks
- J-hook log vanes, constructed riffles, toewood and converging boulder clusters to create a stable riffle-pool sequence that disperses energy and provides aquatic habitat

Partners

- Holyoke Township
- Carlton County Transportation Department
- MN Department of Natural Resources
- Board of Water and Soil Resource—Clean Water Fund
- Carlton County Land owners



Project Costs	
Bridge Construction—DNR State Park Road Account program	\$734,553
Stream Restoration—BWSR Clean Water Fund Grant	\$152,606
Total	\$887,159

Benefit	Result
Stream miles reconnected	10 miles
Sediment Load	49 tons/year
Phosphorus Load	57 lbs./year
Stream restored	340 linear feet