

# The Chippewa 10% Project and the Cropping Systems Calculator

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# Introduction

The 8 digit Chippewa River Watershed (CRW) drains 1.3 million acres of mixed natural & managed ecosystems. Corn and soybeans dominate throughout the watershed, especially in the south. In the eastern and northern sections, grazing livestock and longer crop rotations are common.

## Why 10%?

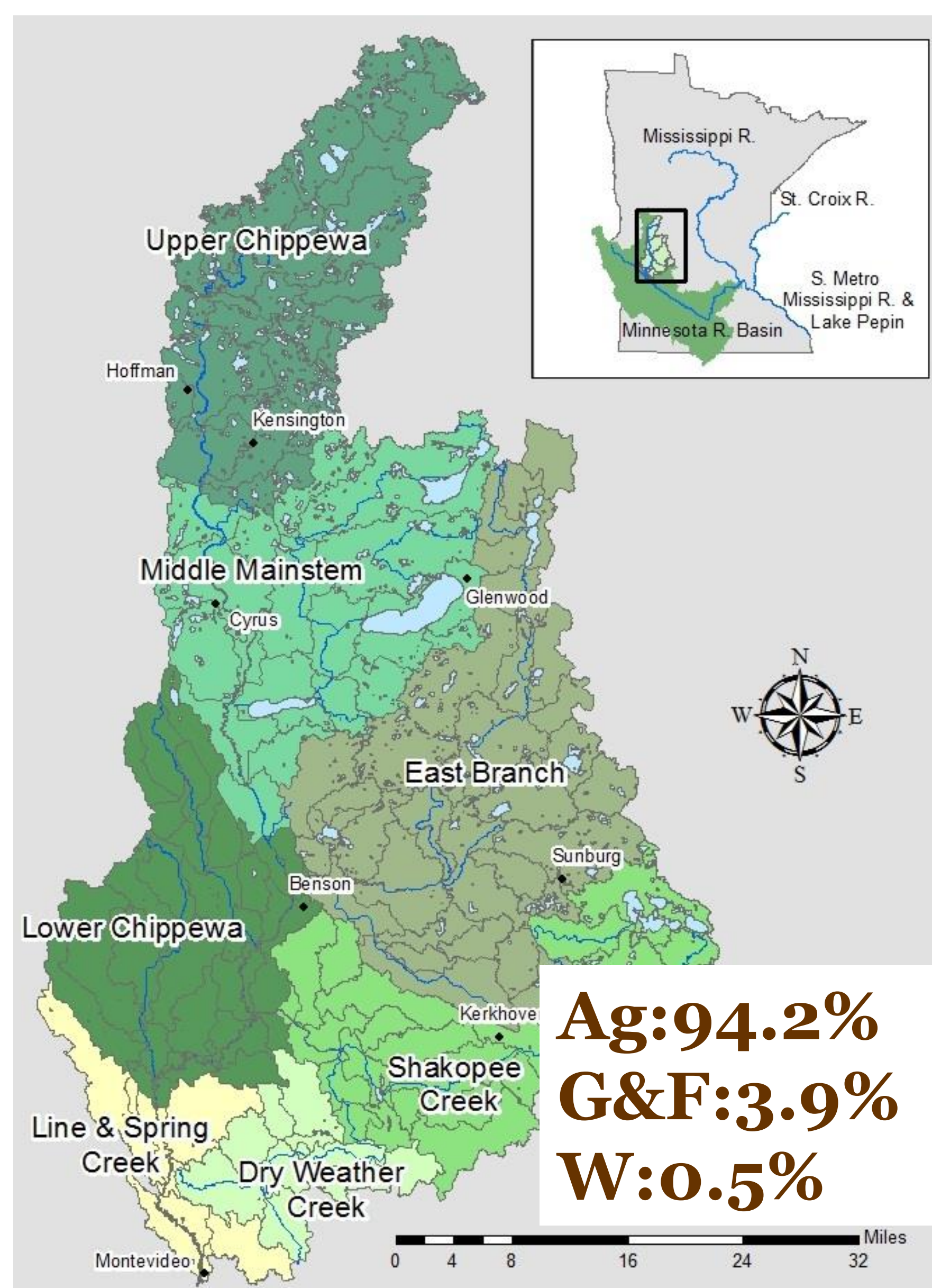
Chippewa River Watershed Project (CRWP) compared land-use in sub-basins with in-stream water quality. Correlations indicated a 10% increase in perennial cover would meet water quality goals.

## Goals

## Meet water quality goals for 12 and 8 digit Chippewa River watersheds

Enhance existing grasslands and achieve 5,380 more acres of grass in Minnesota Prairie Plan local corridor

Engage farmers/landowners to transition 10% of fields from annual row crops to Continuous Living Cover (CLC) in profitable ways



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## Calculating the Cost of Farming with Continuous Living Cover

The Cropping Systems Calculator is Excel-based and allows the comparison of two crop rotations, each up to six years in length. The calculator provides average returns over the rotation as well as a year-by-year breakdown for each crop within the rotations. It takes into account the crop-specific costs as well as the overhead expenses of the entire farm operation, which align with referenced schedule F tax form line items. Many common crops have default figures provided by the Cropping Systems Calculator in order to make it easier to use without knowing the costs associated with a farmer's specific operation. These figures are gathered from the University of Minnesota's farm financial and production benchmark database (otherwise known as FINBIN) for a 10-county area, which covers the Chippewa River watershed region. Using the defaults is optional and they can be easily changed by the users to more accurately reflect the realities of their own enterprises. The more figures farmers are able to enter themselves, the more accurate it will be to their situation.

The Cropping Systems Calculator is not expected to provide an exact amount of income a farmer can rely on earning the following season, but rather a good estimate of the range of returns possible. This is just one of many tools that can be used to help explore options for adding continuous living cover to the landscape.



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## Cropping Systems Calculator: Continuous Living Cover

Number of Acres of Whole Farm	500
Number of Acres to Change	40

Years in Rotation	Original	New
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Original Crop Plan				New Crop Plan			
	Crop 1	Crop 2	Crop 3		Crop 1	Crop 2	Crop 3
Year 1	Corn			Year 1	Corn	LateSeasonCover	
Year 2	Soy			Year 2	Soy		
				Year 3	SpringWheat	Alfalfa	
				Year 4	Alfalfa		
				Year 5	Alfalfa		
				Year 6	Alfalfa	Grazing	

## Average Yearly Costs and Returns from the Two Rotations

Returns are seen as wages for the farm owner in this tool and aren't factored into labor costs.

Total Overhead Expenses	Per Acre		Whole Farm				Percent Difference	
	\$ 115.08		\$57,541.21					
	Original Crop		New Crop					
	Per Acre	Total	Per Acre	Total				
Total Crop Expenses	\$410.14	\$16,405.40	\$491.35	\$19,654.15			20	
Total Crop Income	\$482.13	\$19,285.07	\$810.66	\$32,426.28			68	
Other Income	\$77.49	\$3,099.71	\$31.95	\$1,277.98			-59	
Returns to Management	\$34.40	\$1,376.08	\$236.17	\$9,446.82			587	

-Percent difference shows the percent increase in the new crop when compared to the old crop

### Comparing Grazing on a Per Acre Basis

*Primarily based on the Grass Fed Beef Calculator from the Pasture Project (an initiative of the Wallace Center at Winrock International), the Cropping Systems Calculator has the ability to compare grazing to row crops based on per acre instead of solely per head.*

*It has the ability to compare various types of cattle: cow/calf, stocker, feeder to finish, custom grazing, and short term grazing*

*The CSC provides stocking density estimates based off various types of grazing management styles:*

- *Continuous*
- *Basic Rotational*
- *Managed Intensive Rotational*
- *MOB/Adaptive High Stock Density*



The potential ecological benefits of well managed grazing.  
(Left side of fence post: Undisturbed land full of thistles. Right of fence post: Rotationally grazed land with high plant diversity.)

**Interested in using the Cropping  
Systems Calculator or sharing it with  
others? Email  
[csc@landstewardshipproject.org](mailto:csc@landstewardshipproject.org)  
for more information**

## Monitoring Streams and Fields

- 18 Years of water quality monitoring by the Chippewa River Watershed Project

- Data from farmer networks including Haney Soil Test and tile line monitors

## Predicting Improvements

- Identified 105,000 acres of ecologically sensitive and marginal row crops fields with GIS

- ARS developed ecosystem services coefficients for dominate and organic farming systems, crop rotations, perennials, and continuous and rotational grazing systems, using the Agricultural Production Systems Simulator model (APSIM)

➤ HSPF model + APSIM results predicted that 4% more continuous living cover could greatly contribute in lowering contaminate levels to the required reductions for the watershed. In terms of % reduced towards goal, the impacts would be 40% of N loads, 100% of P loads and 30% of the total maximum daily loads.

## Engaging Farmers

- Through 300+ 1-1 conversations elicit values about stewardship & community, obstacles, options and build relationships

- Discovery and innovation is supported through 4 farmer networks on: rotational grazing, soil health and cover crops, and women non-operating landowners—13,400 acres in changed management

- Simon Lake Challenge is Community Conservation with farmers and landowners using invasive species removal and rotational grazing on a large landscape

## Advancing Systemic Change

- Involve the community—hunters, anglers, bird watchers, lake shore owners, canoeists and others to support land stewardship, shifting narratives and working for supportive policies

- Ask recreational landowners and affinity groups to support managing public and private lands with conservation grazing

- Enlist researchers and modelers to include Continuous Living Cover scenarios and develop an ecosystem services payment pilot

- Engage Natural Resources Conservation Service and agencies about Continuous Living Cover