Lower Minnesota River Watershed Approach

Civic Engagement Project Summary

2018

Photo Credit: Queenan Productions

Introduction

Civic engagement and public participation was a major focus during the Lower Minnesota River Watershed Approach occurring from 2013 through 2018. The MPCA worked with county and SWCD staff in the watershed, consultants, citizens, and other state agency staff to work on two projects to promote civic engagement collaboratively in the area. Projects were tailored to local partner interest and capacity.

The Lower Minnesota Watershed Civic engagement projects were:

- Lower Minnesota Watershed Wraps CE North: Page 3
- Lower Minnesota Watershed Wraps CE South: Page 244

The following pages contain the summary, results, final reports and attachments of each of the two projects

Lower Minnesota Watershed Wraps CE North

The purpose of this project was to identify community/landowner opportunities, obstacles, and opinions on land management and water quality in the rural portion Lower Minnesota River Watershed. Ultimately, this work helped identify land management options for the purposes of surface water quality restoration and protection within the western portion of the Lower Minnesota River Watershed. Sibley County sponsored this project and subcontracted with other counties and SWCDs, University of Minnesota Department of Forestry staff, and Queenan Productions staff to develop project strategies based on their specialized expertise and knowledge of local community goals and interests. The findings from this project were used to inform the development of the watershed restoration and protection strategies (WRAPS) report. Preliminary meetings with local partners determined that basic level public participation (education, outreach, survey input) was appropriate for this project. Public participation focused on education and outreach events focused on BMPS and water quality issues specific to the watershed, a mail survey, interviews and other short surveys focused on BMP implementation. Contract participants also gathered, compiled and analyzed information from the interactions (surveys, interviews and outreach events). The project also encouraged team building of different LGUs so that strategies can be developed for WRAPS in the Sibley, Nicollet, Renville, McLeod, Rice, and LeSueur county areas of the Lower Minnesota River Watershed.

Lower Minnesota River North Watershed Restoration and Protection Strategy Development Final Progress Report

Sibley County in partnership with:

Sibley Soil and Water Conservation District

Minnesota Pollution Control Agency

University of Minnesota Center for a Changing Landscape

Queenan Productions

Table of Contents

1. Grant project summary

Project title: Lower Minnesota River Watershed North WRAPS

Organization (Grantee): Sibley County

Project start date: 10/10/2016 Project end date: 6/30/2018 Report submittal date: 7/31/2018

Grantee contact name: Marilee Peterson Title: Sibley County Auditor

Address: 400 Court Ave

City: Gaylord State: MN Zip: 55334

Phone number: 507-237-4070 Fax: Email: MarileeP@co.sibley.mn.us

Basin (Red, Minnesota, St. Croix, etc.) /Watershed & 8-digit HUC: Minnesota 07020012 County: Sibley

Project type (check one):

- ☐ Clean Water Partnership
- ☒ Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
- ☐ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL/WRAPS Implementation

1.1 Grant funding

Final grant amount: $135,000 Final total project costs: $116,018.1

Matching funds: Final cash: $0 Final in-kind: $0 Final Loan: $0

MPCA project manager: Bryan Spindler

1.2 List of Impairments within Lower Minnesota River Watershed

Reach name	Reach Description	River AUID	Affected designated use	Pollutant or stressor	TMDLStart/End Date
Buffalo Creek	Unnamed cr to High Island Cr	07020012-578	Aquatic life	Fishes Bioassessments	2014/2018
Buffalo Creek	Unnamed cr to High Island Cr	07020012-578	Aquatic life	Turbidity	2014/2018
Chaska Creek	Headwaters to Minnesota R	07020012-512	Aquatic recreation	Fecal Coliform	2014/2018
County Ditch 10	CD 3 to Raven Str	07020012-628	Aquatic recreation	Fecal Coliform	2014/2018
High Island Creek	Bakers Lk to Unnamed cr	07020012-654	Aquatic life	Turbidity	2014/2018

High Island Creek	JD 15 to Bakers Lk	07020012-653	Aquatic life	Turbidity	2014/2018
High Island Creek	Unnamed cr to Minnesota R	07020012-589	Aquatic life	Fishes Bioassessments	2014/2018
High Island Creek	Unnamed cr to Minnesota R	07020012-589	Aquatic life	Turbidity	2014/2018
High Island Ditch 2	Unnamed cr to High Island Cr	07020012-588	Aquatic life	Turbidity	2014/2018
Judicial Ditch 1A	CD 40A to S Br Rush R	07020012-509	Limited Resource Value	*Escherichia coli*	2014/2018
Judicial Ditch 22	Unnamed cr to Silver Cr	07020012-629	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic life	Turbidity	2014/2018
Minnesota River	Carver Cr to RM 22	07020012-506	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Carver Cr to RM 22	07020012-506	Aquatic life	Turbidity	2014/2018
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic life	Turbidity	2014/2018
Minnesota River	High Island Cr to Bevens Cr	07020012-502	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	High Island Cr to Bevens Cr	07020012-502	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Le Sueur Cr to Rush R	07020012-504	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	RM 22 to Mississippi R	07020012-505	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	RM 22 to Mississippi R	07020012-505	Aquatic life	Turbidity	2014/2018
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic life	Turbidity	2008/2014
Minnesota River	Sand Cr to Carver Cr	07020012-532	Aquatic consumption	PCB in fish tissue	1998/2025
Ninemile Creek	Headwaters to Minnesota R	07020012-518	Aquatic life	Fishes Bioassessments	2024/2028
Porter Creek	Headwaters to Sand Cr	07020012-540	Aquatic life	Turbidity	2014/2018
Raven Stream	E Br Raven Str to Sand Cr	07020012-716	Aquatic Life	Chloride	2009/2015
Raven Stream, East Branch	Headwaters (Lk Pepin 40-0028-00) to Raven Str	07020012-543	Aquatic Life	Chloride	2009/2015
Raven Stream, West Branch	Headwaters (Rennenberg Lk 40-0088-00) to E Br Raven Str	07020012-715	Aquatic recreation	Fecal Coliform	2014/2018
Riley Creek	Riley Lk to Minnesota R	07020012-511	Aquatic life	Turbidity	2014/2018
Rush River	M Br Rush R to S Br Rush R	07020012-548	Aquatic life	Turbidity	2014/2018

Rush River	S Br Rush R to Minnesota R	07020012-521	Aquatic life	Turbidity	2014/2018
Rush River, Middle Branch (County Ditch 23 and 24)	CD 42 to Rush R	07020012-550	Limited Resource Value	*Escherichia coli*	2014/2018
Rush River, North Branch (County Ditch 55)	Unnamed ditch to T112 R27W S17, east line	07020012-558	Limited Resource Value	*Escherichia coli*	2014/2018
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Chloride	2009/2015
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Fishes Bioassessments	2014/2018
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Turbidity	2014/2018
Sand Creek	Raven Str to Porter Cr	07020012-538	Aquatic life	Turbidity	2014/2018
Sand Creek	T112 R23W S23, south line to Raven Str	07020012-662	Aquatic Life	Chloride	2009/2015
Sand Creek	T112 R23W S23, south line to Raven Str	07020012-662	Aquatic life	Turbidity	2014/2018
Unnamed creek	Goose Lk (10-0089-00) to Unnamed wetland	07020012-618	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Headwaters to Carver Cr	07020012-526	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Headwaters to Minnesota R	07020012-528	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Unnamed cr to Unnamed cr	07020012-579	Aquatic life	Fishes Bioassessments	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic life	Fishes Bioassessments	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic life	Turbidity	2014/2018
Unnamed creek (Lake Waconia Inlet)	Unnamed wetland to Lk Waconia	07020012-619	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed ditch	Burandt Lk to Unnamed cr	07020012-527	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed ditch	Burandt Lk to Unnamed cr	07020012-527	Aquatic Life	Oxygen Dissolved	2014/2018

2. Executive summary of project

2.1 Problem

The Lower Minnesota River watershed includes the lowest reach of the Minnesota River (Figure 1) and flows into the Mississippi at Fort Snelling. The second largest watershed in the Minnesota River Basin, it covers 1,760 square miles, divided by the Minnesota River itself. Major tributaries in the rural part of the watershed include the Rush River and High Island Creek. Tributaries in the urban area include Bevens Creek, Carver Creek, Sand Creek, Nine Mile Creek, and the Credit River, among others. First 303 (d) listed in 1998, the Lower Minnesota River has a variety of impairments including Turbidity, Fecal Coliform, and PCB in Fish Tissue. Most of the watershed is agricultural, with cities and small towns along the way. As part of the WRAPS, this report was assembled to highlight the civic engagement strategies within the watershed.

2.2 Project highlights

Sibley County partnered with University of Minnesota Department of Forestry staff to prepare an Assessment of Landowner Conservation Action in the Lower Minnesota Watershed. This assessment was prepared by using a combination of in person and mailed surveys meant to evaluate the values and perspectives of landowners within the watershed. Queenan Productions worked with an innovative farmer to produce a video on inter-seeding cover crops and interviewed stakeholders within the watershed to gather perspectives. Lower Minnesota River Watershed partners, including Rice, Le Sueur, Nicollet, McLeod and Sibley counties, worked together to develop outreach strategies.

2.3 Results

The LMRW Major Watershed Project initiative depends on acceptance of best practices across an entire watershed, combining efforts within counties and at individual properties strategically to restore and protect water resources. Widespread support and acceptance of best practices is possible when people participate in public discussion, reflection and collaborative problem solving to frame public issues through a local lens and integrate water resource management into the community context. Sibley Counties and its partners efforts into the matter of civic engagement will hopefully provide insight that helps guide resources over the remainder of the 10-year cycle.

2.4 Partnerships

Sibley County sponsored this project and subcontracted with McLeod County, University of Minnesota Department of Forestry, Queenan Productions, and worked alongside Rice, Nicollet and Le Sueur Counties to develop project strategies based on their specialized expertise and knowledge of local community goals and interests. This partnership will continue after the WRAPS process to deliver effective conservation throughout the watershed.

2.5 Watershed Map

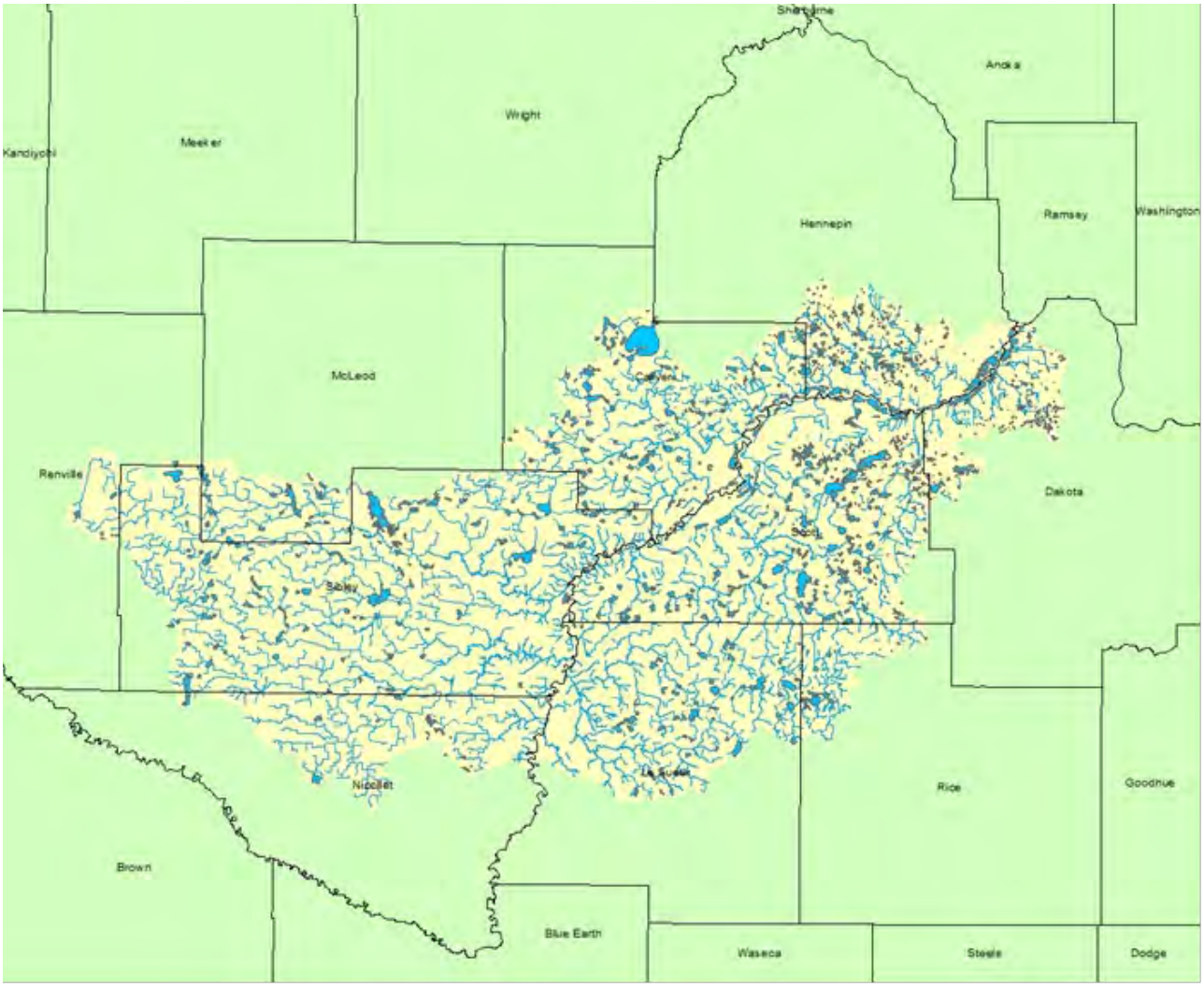


Figure 1. Lower Minnesota River Major Watershed.

Main Report

3. Section I – Work Plan Review

3.1 Summary of Changes:

The Lower Minnesota River Watershed WRAPS North Project work plan underwent some changes over the course of the project. Because of staff turnover and changes, the Sibley County contractor contact changed several times. Project partners also changed with McLeod County and Nicollet County being removed from the work plan. Face to face interviews with landowners done by University of Minnesota staff were added to the work plan.

3.2 Summary of Activities – Goals, Tasks, Objectives:

3.2.1 Objective 1: Community Engagement Team Planning

Task A: Develop Community Engagement Activates

Summary: The engagement team assembled for two initial meetings to organize team efforts and prepare a timeline. Periodic meetings and conference calls where conducted to assist in how local assets, values and perspectives can be leveraged to develop civically-supported restoration and protection strategies to achieve water quality goals over the long-term. To aid in the interview process, time was spent developing questions and identifying potential interviewees. Potential locations for coffee shop focus group meetings where discussed. Progress was reported to members of the LMRW team as needed.

Task B: Attend Community Engagement Training

Summary: Focus group training workshops were held in the fall of 2016 and winter of 2017 by University of Minnesota Department of Forestry personnel with the purpose of learning how to collect data from focus groups. Members from the LMRW area where in attendance. This base knowledge of data collection and survey methods helped LMRW partners develop survey questions and mailing lists and will continue to aid LMRW partners with there understanding of survey results.

Task C: Provide Community Engagement Survey Input

Summary: Staff from the LMRW (Rice, Sibley, McLeod, Renville, Nicollet, Le Sueur) area helped to provided U of M Department of Forestry staff with mailings lists of landowner contacts. Input was also given on mail survey design and a review of survey questions was done.

3.2.2 Objective 2: Community Engagement Implementation

Task A: Conduct Community Engagement Surveys

Summary: Based on feedback from LMRW partners (Rice, Sibley, McLeod, Renville, Nicollet, Le Sueur), U of M Department of Forestry personnel sent out a mail survey to property owners within the LMRW. The surveys purpose was to gage levels of community and civic engagement throughout the watershed. The results were used to aid in the development of a document assessing landowner conservation action within the Lower Minnesota River Watershed.

Task B: Conduct Watershed Citizens Interviews

Summary: Queenan Productions conducted face to face interviews with watershed citizens using questions developed during the planning process. Interviews where used to develop a document analyzing the values and perspectives of citizens in the Lower Minnesota River Watershed, along with a video featuring a local farmer who incorporates cover crops into his farming operation. The University of Minnesota also conducted face to face interviews and used the results to aid in the development of a document assessing landowner conservation action within the Lower Minnesota River Watershed.

Task C: Conduct Coffee Shop Meetings

Summary: Sibley SWCD held coffee shop meetings in Gibbon, Henderson, and Arlington. Outreach was done with direct mailing, newsletters, and social media posts. Topics discussed included; Cover Crops, Water Resources,

Wetland Restorations, and Farming Practices. More extensive lists of the topics discussed at these meetings are available in section 4.3.3.

Task D: Conduct Outreach Events and Promotion

Summary: Outreach events where held at Friends of High Island meetings, the Ney Center, Sibley County Fair, Grackle Days and Breakfast on the Farm. Newsletters containing information on WRAPS and other watershed science where sent out on a regular bias. Postcards promoting WRAPS meetings where sent out across the watershed to encourage attendance in WRAPS meetings.

Task E: Conduct Landowner Best Management Practice (BMP) Interviews

Summary: Sibley County entered into agreement with the University of Minnesota to perform a survey of community assessment and engagement in the Lower Minnesota River Watershed. Input from LMRW team was used to develop questions and mailing list. Results were compiled into a report and sent to LMRW team members to help aid in BMP outreach and implementation. The University of Minnesota held a meeting at Sibley SWCD office in Gaylord, MN to present the results of the project to LMRW technical staff and management.

3.2.3 Objective 3: Community Engagement Documentation

Task A: Project Documentation

Summary: Summaries of the watershed citizen interviews done by Queenan Productions, BMP survey done by the University of Minnesota, and Coffee Shop talks done by Sibley SWCD were prepared based on the results of the projects. Both full interview transcripts and summarized reports where produced.

Task B: Video Production

Summary: Queenan Productions partnered with Sibley County to produce a video featuring a local farmer who works with inter seeding cover crops into his cash crop to help improve soil health. DVD copies were made and distributed to LMRW team members.

3.2.4 Objective 4: Administration

Task A: Progress Tracking

Summary: Progress was tracked to measure public participation. Costs and actives were tracked by Sibley SWCD.

Task B: Progress Management

Summary: Subcontractors filed reimbursement requests with Sibley SWCD.

4. *Section II – Grant Results*

4.1 Measurements

To prepare an assessment of landowner conservation action in the lower Minnesota river watershed, the University of Minnesota distributed a mail survey to 1000 landowners who own property within the lower Minnesota river watershed. Questions were asked on the values, beliefs, norms and behaviors associated with water resources and conservation within the watershed. The resulting quantitative data will help resource professionals understand the drivers and constraints to conservation practice adoptions among landowners.

4.2 Products

4.2.1 Soil and Water Conservation District Newsletters and 319 TMDL Newsletters

Sibley Soil and Water Conservation District mail its quarterly newsletter to 2541 households on 4 separate occasions during the WRAPS process. The Rush River/High Island Creek “River Watcher” 319 TMDL newsletter was mailed to 1700 households on 3 separate occasions during the WRAPS process.

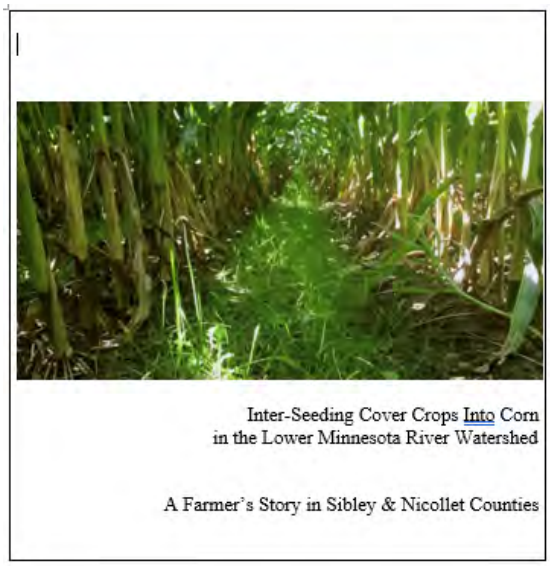
4.2.2 Educational Meetings and Coffee Shop Talks

One educational meeting and 3 “Coffee Shop Talks” were held during the WRAPS process. Postcards promoting the event where mailed out to 1700 households located within the Lower Minnesota River watershed a month in advance of the meeting of the educational meeting. Posters where hung at prominent locations in advance of the coffee shop talks. Meetings were attended by 17 members of the public. Valuable information and insight were gained my LMRW partners.

4.2.3 Community Engagement Training

Two community engagement trainings held by University of Minnesota staff and were attended by LMRW partners.

4.2.4 Video Production from Queenan Productions



This video can be found by using the following link:

https://player.vimeo.com/video/239667045

4.2.5 Lower Minnesota River Watershed Views, Perspective and Values from Queenan Productions

The attached report from Queenan Productions is the result of 8 interviews of watershed stakeholders performed by Anne Queenan of Queenan Productions.

Lower Minnesota River Watershed Views, Perspectives and Values

Lower Minnesota River Waters
Queenan Productions
November 2017

Values & Perspectives from Team & Field Interviews

The following are some world views and themes expressed in watershed team dialogues, feedback and field interviews for the Lower MN River Watershed submitted by Anne Queenan, Queenan Productions.

Cover Crops	**Belief: It can only be grown after the cash crop is harvested - a short window of time – which is not enough time**. New learnings on successful inter-seeding at V6 while the corn crop grows are new and not well known. "Up in South Central Minnesota, we don't have a lot of heat units to grow a cover crop after harvest like they do in other parts of the country." - Keith Hartmann, Cover Crop leader in area, Farmer/Former Agronomist, Gibbon, MN **Concern: Cover crops can serve as a source of nitrogen for cash crop effectively enough to replace fall tillage or to reduce nitrogen application.** "I get questions about whether the cover crops take the nitrogen needed for the corn...." "If I waited until after harvest to seed the cover crop, it would just lay there in seed form because we don't have enough heat after harvest in mid to late October to get that cover crop growing. So that we would not have **return on that investment, that seed investment.** So that is what I am trying to accomplish with this machine and using a low seed rate and high success rate." **Priority: Preserving cash crop's water and nutrients in times of drought** "The other question I get is **what if we get a drought year, is that cover crop going to be taking nutrients, or water away from the corn?** And what I'm seeing now is being only four inches tall, that cover crop is so short, **if we do get a drought, that cover crop will die before it hurts the corn.** So you'll be out your cover crop investment, but you won't be out the corn yield." **Value and Priority: Economical and efficient results, reduction of input costs, no yield hit and return on investment.** Savings of time and resources is possible, but not widely known. Current practice of planting cover crops by air may not be the most efficient and sustainable: "Flying it on with the airplanes in August and they're using 25 to 30 pounds of seed, which is about a $50 seed cost per acre with a 50/50 success rate." When K. Hartmann found he was getting **85% emergence** with his direct seed-to-soil mid-June method, "the following year, **after checking the yield, no yield hit,** that's when I knew I wanted to **build a 12-row machine, a 30-foot inter-seeder... That's how we're going to get our return on investment**, and that's what's going to get more people excited about it. Because **we can handle a $15 per acre seed cost versus a $50, especially in this tight market."** - Keith Hartmann, Gibbon, MN

(Cover crops continued)

Cover Crops can be perceived as weeds. Need to delineate clearly.

- Thoughts from Wayne Cords, MPCA

"**… a late June application,** but that's just **in the middle of the growing season**, and people are **worried it's going to mess up yields**, so they're worried about it in that case."

- Mike Schultz, District Manager, Le Sueur County SWCD

Perception: The temperature of the soil is too cold with cover crops vs. open black dirt fields that warm up for best growth.
"The perception around here is you have black dirt, this is going to warm up - if we don't have it exposed and with cover crop. How do you get it exposed unless it's black? I think it's going to be a long hard journey here."
– Ron Otto, SWCD, Sibley County

Reducing Input Cost: Uncertainty that it is financially sustainable

Traditionally, side dressing and seeding cover crops are done separately. Belief that completely new equipment is needed to do both . One option: add the seeder to a nitrogen applicator. **Doing both at the same time is not how it's been done in the past. Innovative ways of combining equipment are needed**, and sometimes **new equipment. Time saved and input dollars saved on fertilizer and seed does add up and is efficient,** per Hartmann. **Perhaps ways to fund or create the new equipment are needed or getting the word out on how to do it?**

Concern about the challenge of planting cover crops. **"I hope to find newer techniques to make it easier for landowners to get it in**, but in the meantime, we want to continue to push them forward on this."
- Mike Schultz, District Manager, Le Sueur County SWCD

If cover crops could be proven to reduce input costs, then they would be viewed as more valuable and farmers woud be more likely to try it.
Currently, this does not seem to be widely perceived.
"Maybe at some point, if we get to that level we're able to get them to start reducing tillage and plant for more cover crops and ultimately see a cash increase to their net in the future by reducing input costs."

- Mike Schultz, District Manager, Le Sueur County SWCD

"In the High Island Creek and Rush River Watersheds more than 500 acres were established in 2016. The year of **2017 has seen 3.5 times greater interest** with more than eighteen hundred acres enrolled to date for cover crop as part of the High Island Creek and Rush River grant program in Sibley County."
- Coleton Draeger, Former Watershed Coordinator, Sibley County

	While Coleton D. was measuring and recording data from a monitoring water gage from a local creek, he stated, "**It's fairly dirty here in peak flood season.** However, after this summer's season through a $40,000 grant to support more cover crops, we have **maxed out with applicants.** It does seem like **people are beginning to see the added benefits** that cover crops can have on their property."
Herbicide applications/ residue carryover – timing of spraying & planting	Concerns on not knowing how **herbicide residue**/carryover effects the cover crop. Information needed on whether one can spray a week or so before and then plant an annual rye without **negative impact on the cover crop.** – Wayne Cords, Farmer, MPCA
Split Application (Managing Fertilizer Levels) **Strip Till**	**Resistance/lack of support from some neighbors. Changing old ways is not easy.** "I've spoken to my landlords about what I want to do and how I'm doing it and my landlords I rent from can be very positive." "Some of the farmers in the area, they'll say it'll never work. On the wet years it'll never work, on the dry years it'll never work. So, I'm just going to have to prove them wrong and make it work. So, I think I have so far." - Greg Entinger, Strip Till and Split App Farmer, New Prague, MN **Need access to other farmers nearby with helpful resources/shared experiences in split app and strip till.** "So I talked to other farmers, the closest farmer to me is in Northville or Cleveland; I spoke to them numerous times." (15 miles away is far for Greg) - Greg Entinger, Strip Till and Split App Farmer, New Prague, MN
Full tillage, heavy rains & gullies in hilly terrain in eastern part of the watershed	"In '13 we had tremendous amounts of rain. **We had five inches in 45 minutes of rain and I was in full tillage at the time** where I ripped the soil in the fall of the year and then came back in the spring. When you till like that it works up the top 3, 4, 5 inches of soil. That's all loose soil. So when those heavy rains came, that loose soil that I just worked up and planted into, it **washed down the hillsides. As water channeled, it created deeper washouts. I had washouts three feet wide by two feet deep and all that ended up down in the low grounds."** **"I was tired of losing my soil. My neighbors were getting my black dirt, my neighbors were getting my fertilizer** that I applied and so forth. So it was very difficult and I started my research." - Greg Entinger, Strip Till and Split App, New Prague, MN
No Till vs. Strip Till	

Wetlands & Prairie continued	"We saw an **opportunity** to actually **restore wetlands and make it entrepreneurial** to actually earn some money doing that." - Mary Mueller, Landowner, Winthrop, MN **Values:** "Every decision we make on this farm, **we weigh both on economics and ecology.** We own it right now but it's not ours, we know that. We want it to be better than it was when we got it, and we know it was better at some point in the past." - Mary Mueller, Landowner, Winthrop, MN
Profitability of cash crops vs. CRP	**"Right now cash rent's too high.** We have programs**; our CRP program is very well in the meantime, it pays decent for the time being.** Now **if things slowly change,** that might reduce." - Mike Schultz, District Manager, Le Sueur County SWCD "Well, **I applied to put it all in CRP, but because of the soil type, there were only two fields that would get the top payment and then there was another field that would get a reduced payment. But the reason I didn't go into it was** there was an 18-acre parcel near High Island Creek and they told me I'd have to plant trees on it. Well, that didn't appeal to me to plant trees and then what are you going to do with it after 15 years or 10 years. Am I going to go in and pull out all the trees?" - John McSweeney, Retired Farmer/Landowner, Henderson, MN
Conversations & Listening Matters	**"When we first started doing restoration work, it was pretty new, especially in this area.** And there was some **hard conversations with neighbors** at times. There was **hard conservation with agencies** at times, **especially when we used the entrepreneurial approach**. That become a little more difficult and I think **it's just that balance of understanding what it takes financially to really do this stuff** and how you want your time to be compensated, not just your land. I shouldn't say just your land, but you need the land to be paid for, but you want your time to be compensated as well. And there were some interesting **difficult times and you work through them. There's a lot of conversation.** Sometimes you're **assuring your neighbors that no, they're not going to get flooded out because you're restoring wetlands.** And sometimes you're **assuring the agencies that you're really doing the best you can with everything that we have to take in culturally, economically.** So those **conversations were a big part of making this work."** - Mary Mueller, Landowner, Winthrop, MN

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<td>Ravine Stabilization</td>
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Was informed they are very expensive to reimburse by the government programs, but not by the landowner. Interview/more info needed on the actual costs for ravine stabilization.
Landowner point-of-view follows: John McSweeney, Retired Farmer/Landowner, Owner of Three Ravine Stabilization Structures
"The closer you get to the Minnesota River there are more ravines you're going to have."
"The house we're in I think is at 984 feet in elevation right now and parts of the farm are higher, I would say 20 feet higher. And then High Island Creek runs through it and so the water, all the water on the farm goes to High Island Creek and down to the Minnesota River and off to New Orleans."
"It's 200 acres but there's only 67 tillable, so we had that seven inch rain and some of the gullies moved right back into the edge of the fields. We didn't have a downpour like that for as long as I could remember, so I contacted the county and they were great to work with. Mrs. Sullivan and that whole crew up there, they came out and looked at the potential sites and laid it all out."
How about the financing of it all? How does it work?
"It works great. The federal government pays, oh I forget, it seems to me they paid almost 70% on the last one. I think it was a $16,000 job and I think I paid maybe six or 7,000. That one, the last one, the federal government and the state participated in it which further reduced the cost. And then you give them a copy of your check and they deposit the money right into your checking account. Then you have to pay taxes on it, but so what. It's still a wonderful deal, a great deal. I wrote a letter to April Sullivan telling her how happy I was."
Neighbor Influence
AQ: Is it something your other neighbors want to maybe think about doing?
JM: Yes, my neighbor, John Doe, he just put in another one after he saw what I did. That was just completed last fall.
AQ: So is he learning about how to do it financially and pragmatically from you, and then he realizes that there are resources are out there or did he always know about it?
JM: Well, he drives across the new containment facility to get to his field. He has to drive through my farm to get to his. But we've been neighbors for years.
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Family History & Heritage continued	"I think **one of my sons is going to buy the farm. It's 200 acres with the wildlife, deer, wild turkeys and there are a few pheasants. And he loves all these trails."** "This is 54 miles from where he lives and **they really enjoy coming out here. And his kids like that Kaboto for just driving around, but he likes just walking around in it and enjoying it."** "Edmond McSweeney and his brother Tom homesteaded the two 80-acre parcels. Then, if you improved on it, I think you could get another 80. For immediate income, they harvested some of the timber and there was a sawmill that was on the corner of their property and so they harvested much of the original timber. And then, of course, they had horses and cows and a few pigs, but they survived. The first crop they planted was wheat and rutabagas, and the rutabagas were ruined, they weren't any good, they were wormy. But the wheat was a good crop." - John McSweeney, Landowner/Former Farmer, Henderson, MN "The best thing that happened to me is I was able to have some of my own land to play with. **My dad let me rent some of my own** and he said, 'This is yours, you experience it.' And that's one of the things I wanted to try. So, I had the freedom to do it and I think that's the holdback for a lot of young guys - maybe Dad's not onboard so it doesn't happen. So, the best thing that happened to me is I had a little bit of my own (land) to try." - Keith Hartmann, Farmer/Former Agronomist, Gibbon, MN
Privacy	*SWCDs reluctant to talk specifically about their landowner relationships.*
Alternative Crops	According to Willis Anthony, **infrastructure that exists works for corn and soy; it would take a lot more to switch.** **"We have well developed infrastructure for the grains that are being grown in Minnesota now** and so it would, in some cases, require the development of some technology for handling and processing. In other instances, the **infrastructure for handling, shipping and marketing,** in part, is because of **the challenge of not mixing crops.** And then that comes into play with something such as **organic corn. It just cannot be mixed in the combine, in the bins, in the marketing channel with other parts of the crop."** - Willis Anthony, Crop & Hog Farmer, FuelShed, St. Peter, MN
High Flows and Infrastructure Impacts	We deal with the **high drop in elevation on the east side** here on many levels. - Thoughts of Ron Otto, Sibley County SWCD

	"We are seeing more flooding here in Henderson and on a day-to-day basis, especially when the river is rising, it's a little bit nerve-wracking. I spend time watching or trying to predict out there when the water's going to raise high enough to close the roads that I use so that I'm not in some way separated from my children or have to do some giant drive around." **"Currently, the city of Henderson is working with MNDOT on a flood mitigation project where they really are trying to find the best route to hopefully lobby for some dollars to raise the roadbeds. There's three entrances and exits into Henderson that will close during a flood, leaving only one way in and out of town and that's to the west.** And so of those three, which is to the north, to the east and to the south, **which would be the best route to put money into to try and keep open during flood year events. So the other option on Highway 19, which personally I think is the best option, but it would bridge from the Henderson levee all the way across the river channel of course** and also most of the flood plain till you get to the railroad bridge, which naturally would alleviate some of the flooding because it allows the water to go under that full length of the bridge where right now the roadbed somewhat acts as dam, damming the water up a bit. **But that's the most costly project, of course, so they're predicting that one to cost about $40,000,000."** - Becky Pollack, Executive Director, Ney Nature Center, Henderson, MN http://www.dot.state.mn.us/d7/projects/hwy19study/
What's Hopeful?	"Actually, **I think we got the momentum going in our Cover Crop Program**, I really do. I've certainly **heard landowners talk about the benefits** and the good benefits behind it, which is promising in land. We've gotten acres signed up. The more we talk about it and the more we let people understand that that **growing organic material with all the macroinvertebrates and bugs and microbes in the soil** that are able to keep, work in some of these soils when they're wet and keeping that soil living, allowed them to continually produce at a higher level and can also **provide many other clean water benefits, filtration benefits and erosion benefit."** - Mike Schultz, District Manager, Le Sueur SWCD
Age Demographics of Water-Quality Momentum in Landowners	"I believe the farmer was always concerned about **water quality**, but I think **the younger farmer is more concerned about it now than probably a couple generations ago."**

Age Demographics continued	"It's more of a **cultural** thing, and **it's always hard to change old habits,** where the younger generation has grown up with **this water quality thing being pounded into them day in and day out, where the older generation, it wasn't so much.** So the younger generation hears it every day where the older generation maybe didn't." - Ron Otto, Sibley County SWCD
Change in Land Use & Diversity Driven by Economics	"It's getting more to less and less livestock every year the way it seems. I can remember when I was younger, the milkman stopped at every farm along the way and now from Gaynor to Henderson I don't think there's a dairy producer along the highway anymore; they're all gone." - Ron Otto, Sibley County SWCD

Reference: These observations are based on fully transcribed interviews by Queenan Productions located here.

4.2.6 An Assessment of Landowner Conservation Action in the Lower Minnesota Watershed from the University of Minnesota

The attached report from the University of Minnesota is the result of 1000 mail surveys and 16 semi structured face to face interviews of Lower Minnesota River Watershed landowners performed by the University of Minnesota Center for Changing Landscapes.

AN ASSESSMENT OF LANDOWNER CONSERVATION ACTION IN THE LOWER MINNESOTA WATERSHED

Amit Pradhananga, PhD
Sarah Fellows, MS
Mae Davenport, PhD

June 29, 2018

AN ASSESSMENT OF LANDOWNER CONSERVATION ACTION IN THE LOWER MINNESOTA WATERSHED

A Draft Technical Report
Prepared for the Minnesota
Pollution Control Agency

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June 29, 2018

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This project was funded by Clean Water Funds made possible by the Clean Water, Land, and Legacy Act. The funds were administered by MPCA and Sibley County. Its contents are solely the responsibility of the authors and do not necessarily represent the views of MPCA or Sibley County.

Table of Contents

Executive Summary

This report describes a social science assessment of landowner conservation behavior in the Lower Minnesota watershed of Minnesota. The study was conducted by the Center for Changing Landscapes in collaboration with Sibley County and the Minnesota Pollution Control Agency (MPCA). The purpose of this study was to understand landowner values, beliefs, norms and behaviors associated with water resources and conservation. This study helps provide resource professionals with a better understanding of the drivers of and constraints to conservation practice adoption among landowners. This project used a mixed-methods approach using both qualitative data gathered through key informant interviews and quantitative data through self-administered surveys.

Key Findings

- Landowners are farmers are influenced by multiple groups including their family, other farmers, and county's Soil and Water Conservation District in their decision making around water.
- The biggest drivers of conservation practice adoption appear to be perceived benefits of conservation practices, stewardship ethic, availability of financial incentives, and conservation program reformation.
- The biggest constraints to conservation action include lack of financial resources, equipment, and community leadership.
- There is a significant gap between private-sphere (e.g., conservation practice adoption) and public-sphere action (e.g., civic engagement in water protection).
- Lack of norms around civic action is a significant constraint to community engagement in water resource protection.

Recommendations

We recommend a combination of strategies to conservation programming and offer three broad strategies:

- Emphasize benefits of conservation practices and encourage personal commitment to conservation
- Address resource constraints through technical assistance and incentive programs
- Support community-building, and consequent norm development, centering on water engagement

Project Background

This report describes a social science assessment of landowner conservation behavior in the Lower Minnesota watershed of Minnesota. The study was conducted by the Center for Changing Landscapes in collaboration with Sibley County and the Minnesota Pollution Control Agency (MPCA).

Water resource managers are increasingly investing scarce resources in outreach and education programs to promote voluntary adoption of conservation practices and to engage community members in water resource protection. Efforts to promote adoption of conservation practices and engage landowners in conservation must be based on an understanding of the values and beliefs of landowners. The purpose of this study was to understand landowner values, beliefs, norms and behaviors associated with water resources and conservation. This study helps provide resource professionals with a better understanding of the drivers of and constraints to conservation practice adoption among landowners.
This project included a survey of landowners in the Lower Minnesota watershed, as well as in-depth qualitative interviews, to answer three primary research questions:

1. What are the drivers and constraints to conservation practice adoption among landowners?
2. What factors influence landowners' engagement in local conservation initiatives?
3. How can policy-makers and resource professionals design and promote water resource conservation programs that are ecologically and socially relevant, and responsive to the needs and concerns of local landowners?

The information provided in this report is intended to inform and enhance water resource management in the Lower Minnesota watershed. Study findings will be useful in developing and enhancing conservation programs that respond to the needs and concerns of landowners and agricultural producers in the area.

Methods

This project used a mixed-methods approach using both qualitative data gathered through key informant interviews and quantitative data through self-administered surveys. Qualitative data were gathered through in depth interviews with agricultural producers. Quantitative data were collected through a mail survey distributed to 1000 landowners who own property within the Lower Minnesota watershed. The Lower Minnesota watershed contains portions of Sibley, Nicollet, Le Sueur, McLeod, Scott, Carver, Hennepin, Ramsey, Renville, Dakota, and Rice counties. The primary land use in the watershed is agricultural. Major resource concerns in the watershed include erosion and nutrient and chemical contamination (USDA NRCS, n.d.).

Landowner Mail Survey

Data were conducted through a self-administered mail survey of a random sample of landowners who live within the Lower Minnesota watershed. A list of property owners within the Lower Minnesota watershed was obtained from Nicollet County. The list was based on publicly available county tax records and was restricted to property owners who own 40 acres or more. A total of 1000 surveys were distributed by U.S. mail. The surveys were administered from August, 2017 through January, 2018.

Survey instruments were designed based on extensive literature review and feedback from project partners. The survey questionnaire included a variety of fixed-choice and scale questions. Several questions were adapted from survey instruments used in previous studies of attitudes, beliefs and values of conservation behaviors (Davenport & Pradhananga, 2012; Davenport, Pradhananga, & Olson, 2014; Pradhananga, Perry, & Davenport, 2014; Pradhananga and Davenport, 2017; Prokopy et al., 2009). Each questionnaire was labeled with a unique identification number to track responses for subsequent mailings.

An adapted Dillman's (2014) Tailored Design Method was used to increase response rates. The survey was administered in three waves: (1) the questionnaire (Appendix A) with a cover letter (Appendix B), watershed map (Appendix C), and a self-addressed, business reply envelope; (2) a replacement questionnaire with a reminder letter (Appendix D), watershed map and envelope; and (3) a third replacement questionnaire with cover letter, watershed map and envelope.

Returned questionnaires were logged into the respondent database. Response data were numerically coded and entered into a database using Microsoft Excel 2010. Statistical analyses were conducted using Statistical Package for Social Sciences (SPSS release 24.0). Basic descriptive statistics were conducted to determine frequency distributions and central tendency of individual variables.

To examine the factors that influence respondents' clean water actions and engagement in community activities, subgroup comparisons were conducted between respondents with varying levels of clean water action (i.e., high action, low action) and levels of civic engagement (i.e., high engagement, low engagement). Respondent subgroups were compared for differences in their socio-demographic and property characteristics, social influences, awareness of water issues, perceived ability, social norms of conservation action, and community and water resource beliefs.

Farmer Interviews

UMN personnel and partners collaborated to develop a contact script (Appendix E) and interview guide (Appendix F) to facilitate participation. The project was reviewed by the Institutional Review Board (IRB) as designated by both University policy and federal regulations. Partners first provided UMN personnel with an initial list of prospective interview participants. The list was made up of individuals who had recently participated in a county cost-share program for either buffer strips, tile inlet alternatives, or cover crops. UMN personnel expanded the list the Lower Minnesota's watershed newsletter mailing list to include known farmers in the study area.

Sixteen semi-structured interviews were conducted with 16 key informants – in 8 instances, a second individual joined the interview. Participants included farmers who farm their own land and/or farm land rented from others. All interviews occurred at the individual's residence. Participants were offered an optional $20 as an incentive to participate.

The interviewer first answered any questions or concerns the interviewee had prior to beginning the interview. The interviewer emphasized that every reasonable effort would be made to ensure confidentiality and that participation was voluntary. Each participant signed a consent form (Appendix G) and completed a conservation practice checklist (Appendix H) prior to the start of the interview. Following the interview, participants were asked to complete a background information survey on an iPad (Appendix I). This information was used to help understand the sample profile and is only reported in an aggregated summary. No identifying personal information is linked to the interview data.

Qualitative data were analyzed using open coding consistent with adapted grounded theory procedures (Charmz, 2006; Corbin & Strauss, 2008). Additional focused coding was used to highlight responses with direct bearing on the research questions. QSR International's NVivo 11 software was used to perform data analysis including the managing, coding, and organizing of the data (NVivo 2016). Multiple researchers analyzed the data including periodic checks for consistency and applicability. A team of researchers triangulated the coding schema and findings during the open coding processes.

The goal of the qualitative analysis was to develop insights, patterns, and concepts into the farmers' decision-making processes and perspectives, grounded in the data, to inform natural resource managers. While the study findings only represent the beliefs and opinions of the study participants, wide-ranging and diverse perspectives were captured. Study participants have differing backgrounds, experiences, and connections to water, their community, and conservation practices.

Study Findings

Project findings are organized into two sections: landowner mail survey findings and farmer interview findings. The survey findings are further organized into five sub-sections that respond to 14 unique research questions. Interview findings are organized into two sub-sections.

Survey Findings

Overall, 304 landowners completed and returned the survey for a response rate of 32% (adjusted for 49 surveys returned undeliverable). Complete statistics for all survey questions in aggregate are presented in tabular form in Appendix J. Findings from subgroup comparisons are presented in tabular form in Appendix K.

1. Who are respondents and what are their property ownership characteristics?

Respondents were asked a series of questions about their socio-demographic background and property ownership characteristics. A majority of respondents were male (78%). The respondents ranged in age from 28 to 98 with a median age of 67. A vast majority of respondents characterized their race and ethnicity as white (98%). Almost one-third of respondents (29%) had attained at least a college bachelor's degree. More than half of the respondents (51%) reported an annual household income of $75,000 or more (Appendix J, Table 1).

Most respondents (86%) reported that their property borders a ditch, stream, lake, or river. A vast majority of respondents (91%) used their land for agricultural production. Over half of respondents (59%) reported that 50% or more of their income is dependent on agricultural production. Over one-third of respondents (38%) own and manage their land, and about half of the respondents (50%) make their own management decisions. Over one-third of respondents (35%) are currently enrolled in a program that offers financial incentives for conservation practices (Appendix J, Table 2). Almost three-fourths of respondents (71%) own more than 100 acres of land. Among the respondents who rent their land to others, over two-thirds (68%) rent out 100 acres or more. Among respondents who reported using their land for agricultural production, a majority (71%) have 100 acres or more in agricultural production (Appendix J, Table 3).

2. How do respondents view their community?

Survey respondents were asked to identify what comes to mind first when they think of their community. Several choices were provided including neighborhood, county, city, and watershed. Respondents were also asked to rate the importance of several community qualities on a 5-point scale from very unimportant (-2) to very important (+2). Over one-third of respondents (41%) defined their community as their neighborhood. A small minority of respondents (2%) defined their community as their watershed (Appendix J, Table 4). Water appears to be highly valued amenity for respondents. A vast majority of respondents (87%) rated clean streams, rivers, and lakes as somewhat to very important. A majority of respondents also rated good relationships among neighbors (89%), strong family ties (86%), and access to natural areas/views (72%) as important qualities of a community (Appendix J, Table 5, Figure 1).

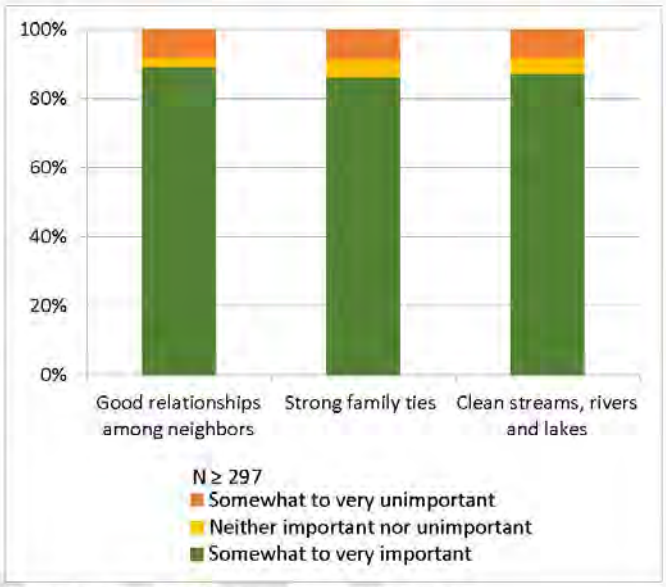

Figure 1. Respondents' ratings of community qualities

3. What are respondents' beliefs about water resources?

Respondents were asked to report how they use water resources in their watershed. Most respondents reported using water for drinking (83%), observing wildlife (57%), and experiencing scenic beauty (48%) (Appendix J, Table 6).

Respondents were asked to report their familiarity with water issues in their watershed on a 4-point scale from not at all familiar (1) to very familiar (4). Respondents were also asked to rate the quality of water in the stream, lake or river closest to them and in the Minnesota River on a 5-point scale from very poor (1) to very good (5). A majority of respondents (61%) reported that they are moderately to very familiar with water issues in their watershed (Appendix J, Table 7). Almost three-fourths of respondents (74%) rated the quality of water in the stream, lake or river closest to them as fair to very good. A majority of respondents (52%) also rated the quality of water in the Minnesota River as fair to very good (Appendix J, Table 8).

Respondents were asked to rate a series of statements regarding their beliefs about water pollution, water resource protection, and conservation practices on a five-point scale from strongly disagree (-2) to strongly agree (+2). A vast majority of respondents (87%) agreed that water pollution affects human health, and that excessive water runoff causes soil and nutrient loss (Figure 2). While a majority of respondents either disagreed or were unsure that water resources in Lower Minnesota are adequately protected (56%), most respondents somewhat to strongly agreed that water resources in Minnesota need better protection (63%) (Appendix J, Table 9).

While a majority of respondents agreed that drainage tiling contributes to higher water flows downstream (62%), a vast majority of respondents also agreed that drainage tiling increases crop yield (88%). A majority of respondents agreed that conservation practices protect aquatic life (82%) and that conservation practices contribute to quality of life in their community (67%) (Figure 2). Over three-fourths of respondents (78%) somewhat to strongly agreed that conservation drainage management reduces runoff from farmland (Appendix J, Table 10).

Respondents were asked to rate the extent to which they agreed or disagreed with a series of statements identifying individuals or groups (e.g., farmers, local government, urban residents) responsible for protecting water resources on a 5-point scale from strongly disagree (-2) to strongly agree (+2). A vast majority of respondents (89%) agreed that it is their personal responsibility to make sure that what they do on their land does not contribute to water resource problems. A majority of respondents also agreed that landowners upstream (83%), farmers in their watershed (85%), and urban residents in their watershed (80%) should be responsible for protecting water. Similarly, a majority of respondents agreed that local (62%) and state government (50%) should be responsible for protecting water (Appendix J, Table 11).

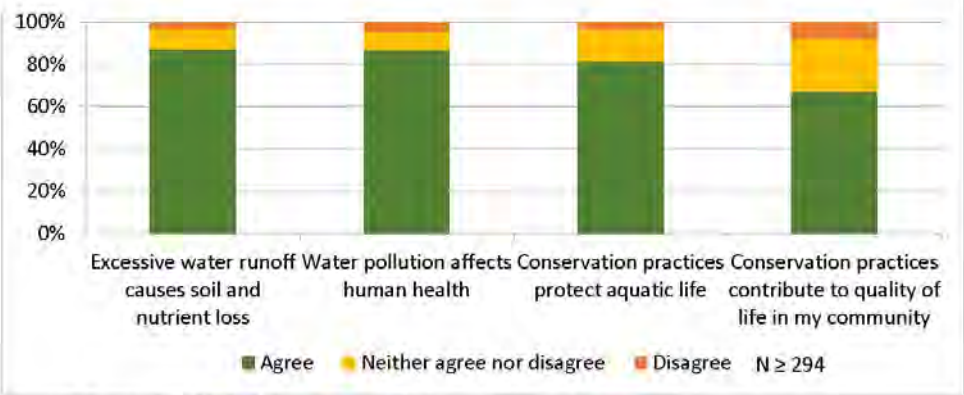

Figure 2. Respondents' beliefs about water pollution and conservation practices

4. Are respondents concerned about the consequences of water pollution?

Respondents were asked to indicate the extent to which they perceive a series of water pollutants/issues and sources of water pollutants/issues as a problem, on a four-point scale from not a problem (1) to severe problem (4). The five pollutants/issues in the watershed rated on average as the biggest problems include nitrogen in surface water, sediment (cloudiness), phosphorus, flooding, and algae (Appendix J, Table 12). On average, respondents rated fertilizer management for lawn/turf care, urban/suburban water runoff, urban land development, increased frequency or intensity of storms, and stream bank erosion as the five biggest sources of pollutants/issues in their watershed (Appendix J, Table 13).

The survey also inquired about respondents' concerns related to the consequences of water pollution for various uses or purposes. Response was on a five point scale from strongly disagree (-2) to strongly agree (+2). A vast majority of respondents were concerned about the consequences of water pollution for future generations (86%), their or their family's health (80%), and people in their community (77%) (Appendix J, Table 14).

5. Do respondents and their communities have the ability to protect water resources?

Respondents were asked to rate the extent to which they agreed with a series of statements about their own ability and their community's ability to protect water resources on a 5-point scale from strongly disagree (-2) to strongly agree (+2). Most respondents (83%) agreed that their use of conservation practices contributes to healthy water resources. A majority of respondents also agreed that they can learn almost anything about natural resource stewardship if they set their mind to it (76%) and that they have the knowledge and skills to use conservation practices on their land (64%). However, a majority of respondents either disagreed or were unsure that they have the financial resources needed to use conservation practices on their land (61%) and that they have the equipment to adopt a new conservation practice (77%). A majority of respondents (54%) agreed that farmers in their community have the ability to work together to change land use practices. However, a majority of respondents either disagreed or were unsure that their community has the financial resources (78%) and leadership (74%) it needs to protect water resources (Appendix J, Table 15, Figure 3).

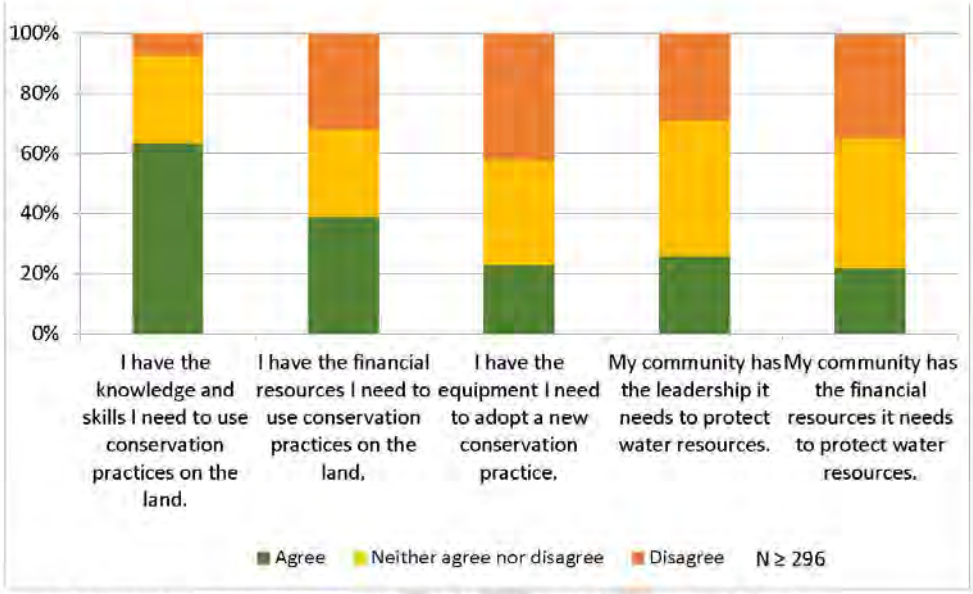

Figure 3. Respondents' perceptions about their and their community's ability to protect water

6. Do respondents feel personally obligated to protect water resources?

Respondents were asked to rate the extent to which they felt a personal obligation to engage in various actions to protect water resources on a five-point scale from strongly disagree (-2) to strongly agree (+2). A vast majority of respondents reported feeling a personal obligation to maintain their land/farm in a way that does not contribute to water resource problems (85%), do whatever they can to prevent water pollution (81%), and use conservation practices on their land/property (75%). However, fewer respondents felt a personal obligation to talk to others about conservation practices (50%), work with other community members to protect water resources (41%), and attend meetings or public hearing about water (28%) (Appendix J, Table 16, Figure 4).

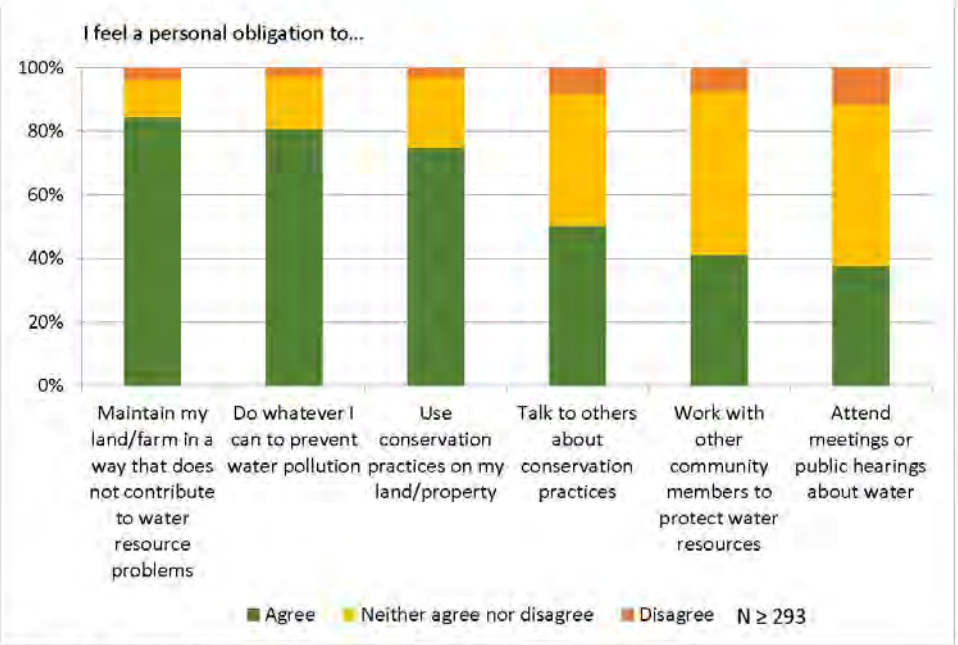

Figure 4. Respondents' feelings of personal obligation to protect water resources

7. What are respondents' beliefs about their influence on land and water management?

The survey also inquired about respondents' beliefs about their level of influence and control over land/farm and water management. Respondents were asked to rate their level of influence over water protection, farmland preservation, and civic action in their community on a four-point scale from not at all (0) to a lot (3). Respondents were also asked to rate the extent to which they agreed or disagreed with a series of statements regarding their feelings of control over land/farm management.

More than two thirds of respondents (68%) reported that they have some to a lot of influence over preserving farms and farmland in the area. Most respondents (64%) also believed that they have some to a lot of influence over protecting clean water in the area. However, a majority of respondents (51%) believed that they have not at all to little influence over inspiring or organizing others to take action in their community (Appendix J, Table 17).

A vast majority of respondents (85%) agreed that by taking an active part in conservation, people can keep water clean in Minnesota. Most respondents (71%) also agreed that the average farmer/landowner can have an influence on rural community life in the region. Most respondents either disagreed or were unsure (75%) that most of what happens on their farm/land is beyond their control. However, most respondents (65%) agreed that it is difficult to have much control over policies that affect their farms/lands and almost half of the respondents (48%) agreed that there is nothing they can do to keep the costs of farm/land management from going up.

Weather also seemed to be a decision making factor that respondents have little control over. A majority of respondents (56%) agreed that weather has a big impact on their decisions about conservation practices on their land. A majority of respondents (69%) disagreed or were unsure whether they can rely on weather forecasts to manage their farm/land (Appendix J, Table 18).

8. What practices do respondents currently use and what practices are they likely to use in the future?

Respondents were asked to indicate if they currently use 19 different practices on their properties. A majority of respondents use practices such as drainage tiles (93%), "minimizing use of fertilizers/pesticides on lawns and gardens" (87%), "protect wetlands on the land/property" (75%), buffer strips along streams and ditches or field edges (75%), and "follow a nutrient management plan on the farm" (72%). Smaller proportions of respondents use practices such as rain garden (6%), and rotation grazing (19%), and rain barrel or cistern to store water (20%) (Appendix J, Table 19, Figure 5).

Respondents were also asked to indicate if they intend to use 19 different practices on their properties in the future. A majority of respondents intend to use practices such as drainage tiles (91%), "minimizing use of fertilizers/pesticides on lawns and gardens" (87%), buffer/filter strips along streams and ditches or field edges (86%), protect wetlands on the land/property" (75%), drainage tiles (76%), and "follow a nutrient management plan on the farm" (69%). Smaller proportions of respondents intend to use practices such as rain garden (6%), rotation grazing (23%), and rain barrel (24%) (Appendix J, Table 19).

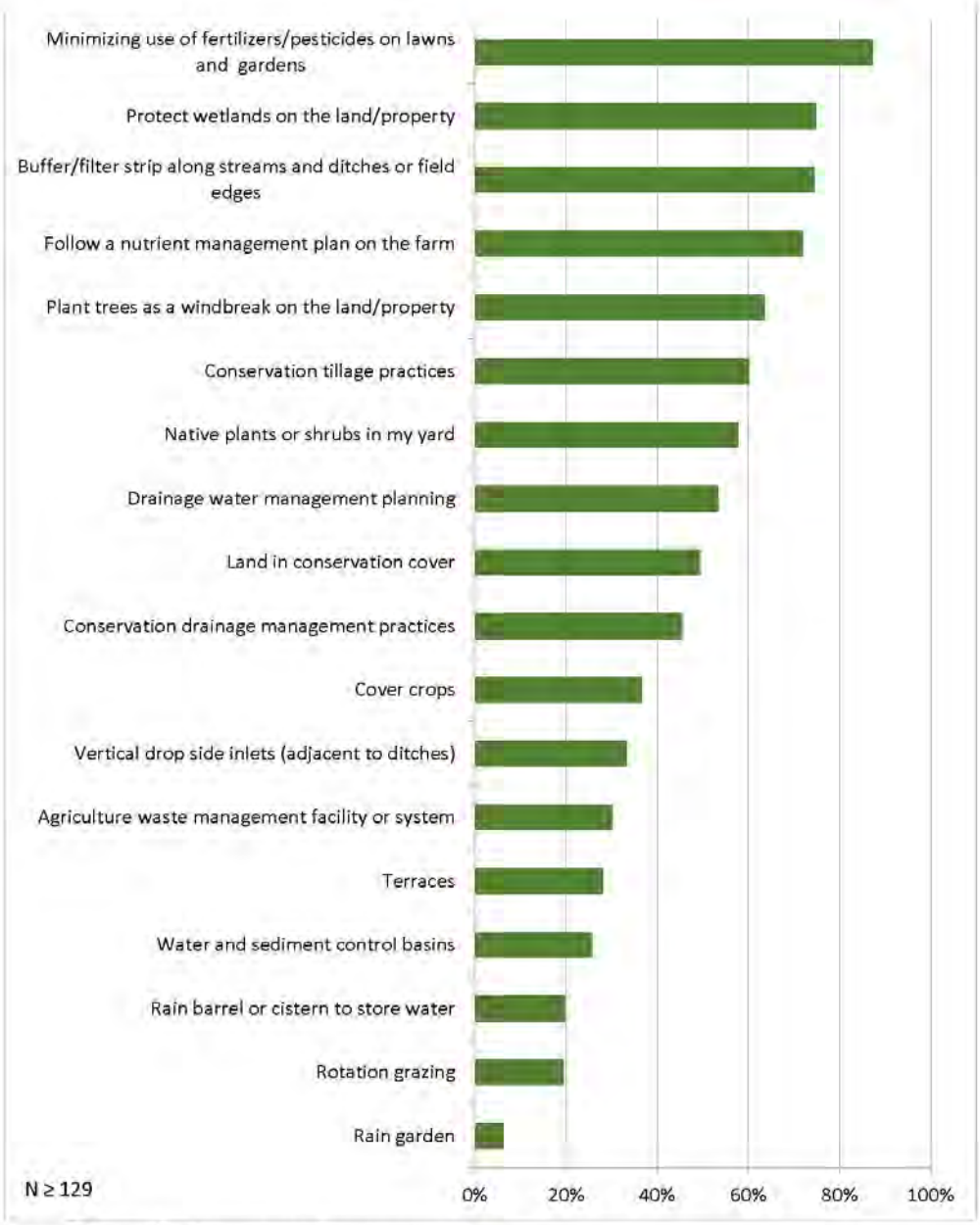

Figure 5. Respondents' current use of conservation practices

9. What would increase the likelihood that respondents would adopt or maintain conservation practices?

Respondents were asked to rate a series of statements about conditions or actions that might influence their adoption or continued use of conservation practices on a five-point scale from strongly disagree (-2) to strongly agree (+2). Providing payments/financial assistance, reducing complexity of conservation programs, and presenting evidence that conservation practices improve water resources appear to be major factors that would increase the likelihood of conservation practice adoption among respondents. Most respondents (62%) reported that they would be more likely to adopt new conservation practices if they could get higher payments for adopting conservation practices. A majority of respondents also reported that they would be more likely to adopt new conservation practices if they were compensated for lost crop production because of conservation practices (60%), and if they had access to financial resources to help adopt conservation practices (54%). A majority of respondents (59%) agreed that they would be more likely to adopt new conservation practices or continue to use practices if conservation program requirements were less complex. More than half of the respondents (53%) also agreed that they would be more likely to adopt new conservation practices or continue to use practices if they had evidence that conservation practices improved water resources (Appendix J, Table 20, Figure 6).

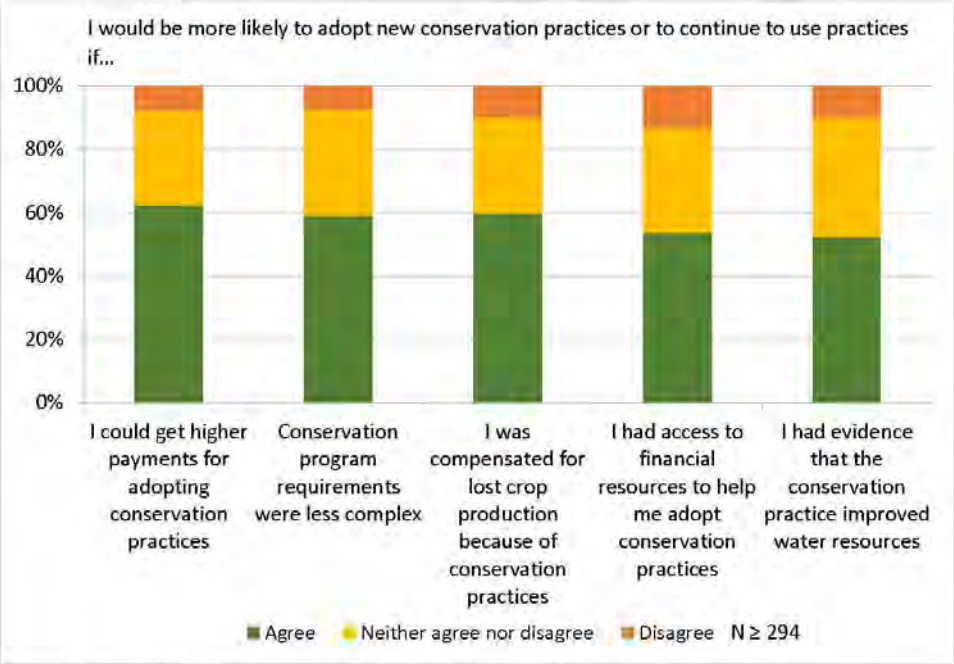

Figure 6. Factors that would increase the likelihood of conservation practice use among survey respondents

10. How engaged are respondents in their community?

Respondents were asked to indicate the extent to which they had engaged in 7 civic actions in the past 12 months on a five-point scale from never (0) to weekly or more (4). More than half of the respondents reported that they had volunteered for community organizations or events (51%) and talked to others about conservation practices (59%) at least every few months in the last 12 months. A vast majority of respondents had not taken a leadership role around water resource conservation in the community (93%), participated in a water resource protection initiative (78%), or worked with other community members to protect water (78%) (Appendix J, Table 21).

11. How likely are respondents to be engaged in civic actions in the future?

Respondents were asked to indicate the extent to which they intend to engage in 6 civic actions in the next 12 months on a five-point scale from most certainly not (-2) to most certainly will (+2). Most respondents were either unsure or did not intend to engage in civic actions such as contacting conservation assistance professionals about water resource initiatives (66%), working with other community members to protect water (77%), or attending a meeting or public hearing about water (66%) (Appendix J, Table 22).

12. Who influences respondents' decisions about conservation?

Respondents were asked to rate the extent to which individuals or groups influence their decisions about conservation on a four-point scale from not at all (1) to a lot (4). On average, the five individuals or groups with the biggest influence on respondents' conservation decision making are family, farmers, county's soil and water conservation district, neighbors, and the farm service agency. County's farm bureau and farmer's union were least likely to have an influence on respondents' conservation decision making (Appendix J, Table 23).

Respondents were also asked to list their three most trusted sources of information regarding water quality issues and solutions. Overall, respondents' three most trusted sources of information were their county's soil and water conservation district (30%), farmers (22%), and their family (19%) (Appendix J, Table 24).

13. To what extent is there a perceived social norm of civic action?

Respondents were asked to rate a series of statements regarding social norms of civic action on a five-point scale from strongly disagree (-2) to strongly agree (+2). A majority of respondents either disagreed or were uncertain that important others attend meetings or public hearings about water (65%), work with other community members to protect water (67%), or talk to others about conservation practices (71%). Similarly, most respondents either disagreed or were unsure that important others expect them to work with other community members about conservation practices (75%), or attend meetings or public hearings about water (74%) (Appendix J, Table 25).

14. What are important differences between subgroups of respondents?

Levels of clean water action

Survey respondents who used their land for agricultural production (n = 267) were placed into one of two categories based on the number of conservation practices they had adopted: high clean water action (HA) respondents (i.e., respondents who have adopted 7 or more of the 14 clean water actions listed), and low clean water action (LA) respondents (i.e., respondents who have adopted fewer than 7 of the 14 clean water actions listed).

There were no significant differences between HA and LA respondents in sociodemographic characteristics such as age, gender, and income. Some notable differences emerged between HA and LA respondents in their perceptions of community qualities, familiarity with water resources, beliefs about conservation practices, perceived ability, personal and social norms, levels of civic engagement, motivations for practice adoption, and individuals or groups that influence their conservation decision making.

HA respondents placed greater importance of community qualities such as good relationships with neighbors, opportunities to be involved in community projects, opportunities to express their culture and traditions, and clean streams, rivers, and lakes than LA respondents (Appendix K, Table 2).

HA respondents were more familiar with water resource issues in their watershed than LA respondents (Appendix K, Table 3). HA respondents agreed to a greater extent that water pollution affects human health than LA respondents. HA respondents agreed to a greater extent than LA respondents that conservation practices protect aquatic life and that conservation practices contribute to quality of life in their community. While HA respondents agreed to a greater extent that drainage tiling increases crop yield than LA respondents, HA respondents agreed to a greater extent than LA respondents that conservation drainage management reduces water runoff from farmland (Appendix K, Table 3).

HA respondents feel a stronger sense of personal obligation to protect water than LA respondents. HA respondents agreed to a greater extent than LA respondents that they feel a personal obligation to i) maintain their land/farm in a way that does not contribute to water resource problems, ii) use conservation practices on their land, and iii) do whatever they can to prevent water pollution. HA respondents also reported feeling a stronger sense of personal obligation to engage in civic actions. HA respondents agreed to a greater extent than LA respondents that they feel a personal obligation to i) talk to others about conservation practices, ii) work with other community members to protect water resources, and iii) attend meetings or public hearings about water (Appendix K, Table 3). HA respondents also feel greater social pressures than LA respondents. HA respondents agreed to a greater extent than LA respondents that people who are important to them i) expect them to attend meetings or public hearings about water, and ii) attend meetings or public hearings about water (Appendix K, Table 3).

HA respondents agreed to a greater extent that their use of a conservation practice contributes to healthy water resources than LA respondents. HA respondents agreed to a greater extent than LA respondents that by taking an active part in conservation, people can keep water clean in Minnesota. HA respondents agreed to a greater extent that they have the knowledge and skills to use conservation practices on their land than LA respondents. HA respondents also agreed to a greater extent than LA respondents that they can learn almost anything about natural resource stewardship if they set their mind to it (Appendix K, Table 4).

There were significant differences between HA and LA respondents in their motivations for practice adoption. HA respondents agreed to a greater extent than LA respondents that they would be more likely to adopt new conservation practices or continue to use practices if they i) had access to financial resources to help them adopt new conservation practices, ii) could get higher payments for adopting conservation practices, iii) were compensated for lost crop production because of conservation practices, and iv) could learn how to maintain conservation practices for soil conservation (Appendix K, Table 4).

HA and LA respondents also differed in their levels of civic engagement in community and water-related activities. On average, HA respondents were more likely than LA respondents to have volunteered for community organizations or events, participated in a water resource protection initiative, worked with other community members to protect water, talked to others about conservation practices, and attended a meeting or public hearing about water (Appendix K, Table 5).

Differences also emerged between HA and LA respondents in the extent to which different groups and individuals influence their conservation decision making. HA respondents reported that they were influenced to a greater extent than LA respondents by their family, farmers, neighbors, their county's Soil and Water Conservation District, university researchers, Minnesota Department of Natural Resources, Minnesota Department of Agriculture, the Farm Service Agency, the National Resource Conservation Service, their local extension agent, certified crop advisors, their local co-op, and their agronomist/agricultural advisor (Appendix K, Table 6).

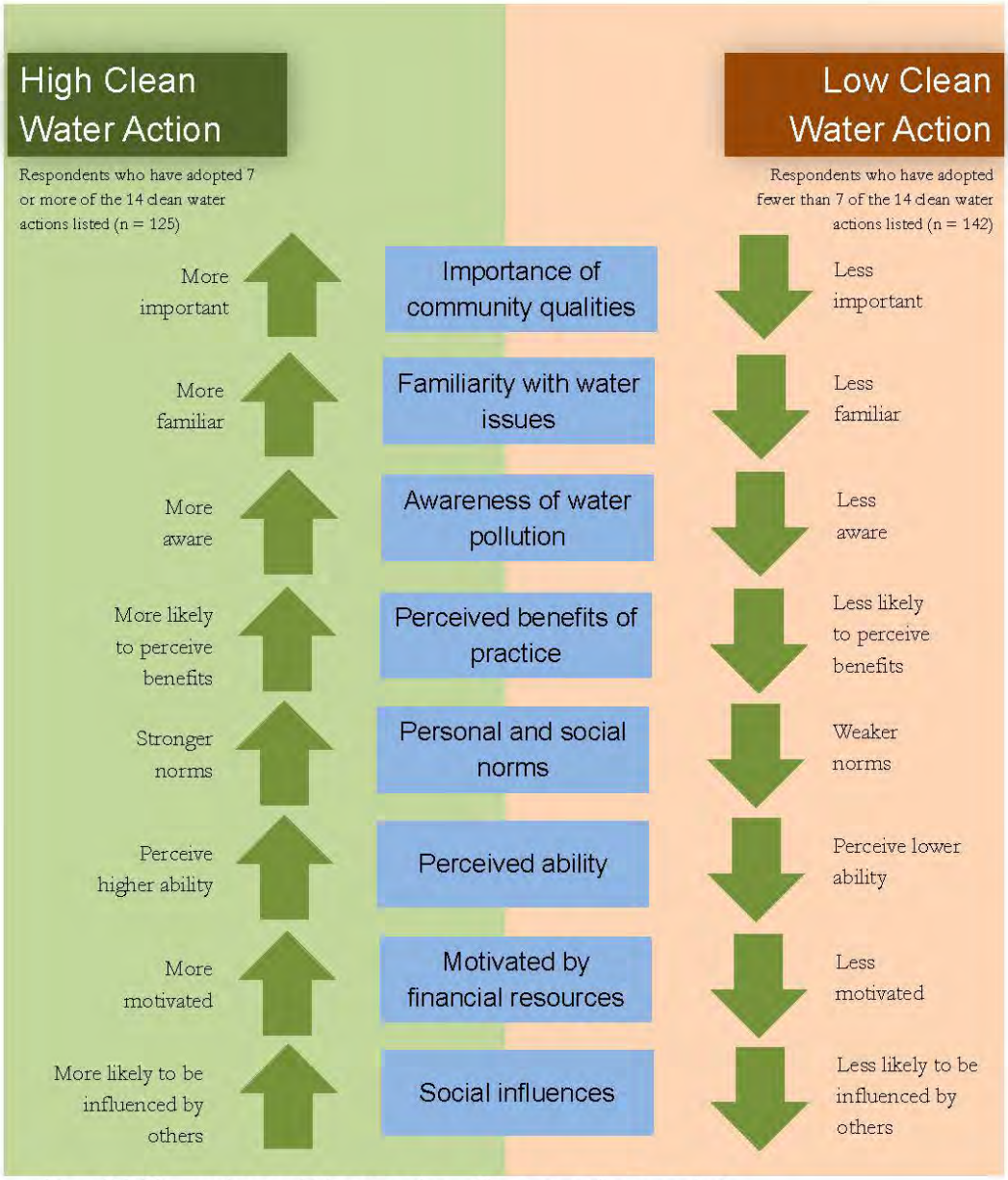

Figure 7. Differences between high water action and low water action respondents

Levels of civic engagement

Survey respondents were placed into one of two categories based on their reported levels of engagement in civic actions in the past 12 months: high civic engagement (HCE) respondents (i.e., respondents who have participated in two or more of the 7 community activities listed), and low civic engagement (LCE) respondents (i.e., respondents who have participated in fewer than 2 of the community activities listed).

There were no significant differences between HCE and LCE respondents in sociodemographic characteristics such as age and education. There was a significant difference between HCE and LCE respondents in gender. A greater proportion of male respondents than female respondents reported participating in two or more community activities in the past 12 months (i.e., were HCE respondents) (Appendix K, Table 8).

Some notable differences emerged between HCE and LCE respondents in their perceptions of community qualities, familiarity with water resources, beliefs about practices, perceived ability, perceived control and influence, personal and social norms, and individuals or groups that influence their conservation decision making.

HCE respondents placed greater importance on community qualities than LCE respondents. Specifically, HCE respondents placed greater importance on "opportunities to be involved in community projects" than LCE respondents (Appendix K, Table 9).

HCE respondents were more familiar with water resource issues in their watershed than LCE respondents. HCE respondents agreed to a greater extent that drainage tiling increases crop yield than LCE respondents. HCE respondents were more likely to feel a stronger sense of personal responsibility for water resource protection than LCE respondents. HCE respondents agreed to a greater extent than LCE respondents that it is their personal responsibility to i) help protect water, and ii) make sure that that what they do on their land doesn't contribute to water resource problems (Appendix K, Table 10).

HCE and LCE respondents also differed in perceptions of ability, control, and influence. HCE respondents agreed to a greater extent that their use of conservation practice contributes to healthy water resources than LCE respondents. HCE respondents also agreed to a greater extent than LCE respondents that they have the knowledge, skills, and financial resources they need to use conservation practices on their land. HCE respondents agreed to a greater extent than LCE respondents that if there is someone they want to meet in their community, they can usually arrange it. HCE respondents agreed to a greater extent than LCE respondents that they find it easy to play an important role in most group situations within their community. HCE respondents disagreed to a greater extent than LCE respondents that most of what happens on their land is beyond their control. HCE respondents believed to a greater extent than LCE respondents that they have influence over "protecting clean water in the area" and "inspiring or organizing others to take action in the community" (Appendix K, Table 10).

HCE respondents also reported feeling a stronger sense of personal obligation to protect water than LCE respondents. HCE respondents agreed to a greater extent than LCE respondents that they feel a personal obligation to i) maintain their land/farm in a way that does not contribute to water resource problems, ii) use conservation practices on their land, and iii) do whatever they can to prevent water pollution. Differences also emerged between HCE and LCE respondents in their feelings of personal obligation to engage in civic

actions. HCE respondents agreed to a greater extent that they feel a personal obligation to talk to others about conservation practices, and attend meetings or public hearings about water (Appendix K, Table 11).

HCE respondents also reported feeling greater social pressures to engage in civic actions than LCE respondents. HCE respondents agreed to a greater extent than LCE respondents that people who are important to them expect them to i) talk to others about conservation practices, ii) work with other community members to protect water, and iii) attend meetings or public hearings about water. Further, HCE respondents agreed to a greater extent than LCE respondents that people who are important to them i) talk to others about conservation practices, ii) work with other community members to protect water, and iii) attend meetings or public hearings about water (Appendix K, Table 11).

There were significant differences between HCE and LCE respondents in the extent to which different groups influence their conservation decision making. HCE respondents reported that they were influence to a greater extent than LCE respondents by their county's Soil and Water Conservation District, the Farm Service Agency, the National Resource Conservation Service, agricultural commodity associations, and their agronomist/agricultural advisor (Appendix K, Table 12).

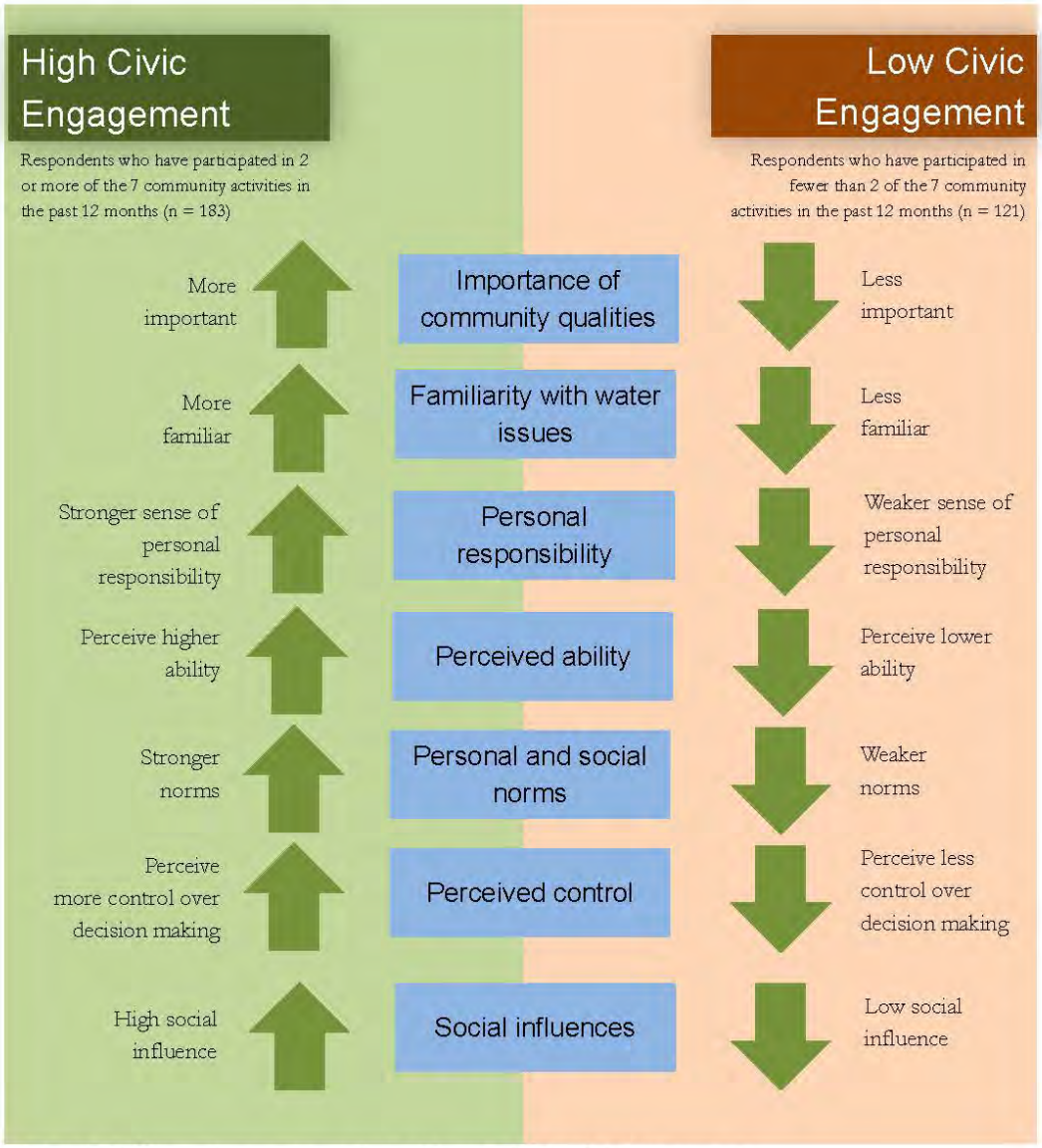

Figure 8. Differences between respondents with varying levels of civic engagement

Interview Findings

1. Interview Participant Profile

Interview participants were asked to complete a background information form (n=16) on an iPad provided by the researcher which included basic sociodemographic questions and questions about their farm. Participants represent varying farm ownership arrangements, farm sizes, and income levels. Interview participants' ages ranged from 31 to 79 with a median age of 58 years. The majority of primary respondents (15 of 16) were male. During 8 interviews either the primary participants' wife, mother, or son also participated in the discussion, but only the primary participant is represented in the profile data. Many of the participants had lived in the community for most of their lives (Table 1). The participants had been farming for a living between 15 and 48 years, with a median 36.5 years farming. On average, the participants' farms had been in the family for more than 80 years. All participants farmed their own land, with over 60% also renting more land from another party (Table 2). Over 80% of participants reported at least 50% of their household income was dependent on farming. Farm operation size ranged from 346 to 2800 acres. All participants farmed corn and soybeans primarily – other crops farmed include alfalfa, wheat, sweet corn, peas, barley, and hay (Table 3). About half the participants also raised livestock, including hogs, cattle, chicken, and sheep. All participants reported involvement in farming-related organizations/associations in their community. The primary organizations participated in were MN Corn Growers Association (88%), MN Soybean Growers Association (81%) and American and/or MN Farm Bureau (56%).

Table 1. Interview participant profile

Primary Participant Socio-Demographic Characteristics		n	Percent
Gender	Male	15	94
	Female	1	6
Age	Median	58	-
	Minimum	31	-
	Maximum	79	-
Years lived in community	Median	52.5	-
	Minimum	31	-
	Maximum	78	-
Years farming	Median	36.5	-
	Minimum	15	-
	Maximum	48	-
Formal education	Did not finish high school	0	0
	Completed high school	4	25
	Some college but no degree	4	25
	Associate or vocational degree	5	31
	College bachelor's degree	2	13
	Some graduate work	0	0
	Completed graduate degree (MS or PhD)	1	6
Household income	Under $34,999	1	6
	$35,000-$49,000	0	0
	$50,000-$74,999	2	13
	$75,000-$99,999	6	38
	$100,000-$149,999	4	25
	$150,000 or more	3	19

Table 2. Interview participants' property characteristics

Property Characteristics		n	Percent	Mean
Property Size	Under 500 acres	8	50	
	500-1000 acres	5	31	662
	1001 or more acres	3	19	
Percent income dependent on farming	0%	0	0	-
	1-25%	0	0	-
	26-50%	2	13	-
	More than 50%	13	81	-
	Did not answer	1	6	-
Ownership arrangement	I own and farm my own land only	6	38	-
	I own/farm and rent *from* another party	10	62	-
	I own/farm and rent *to* another party	0	0	-
	I rent my land *to* another party	0	0	-
	I rent my land *from* another party	0	0	-
	Does not farm	0	0	-
Years farm has been in the family	Median	70	-	-
	Mean	86	-	-
	Minimum	31	-	-
	Maximum	161	-	-
Acres Farmed	Median	807.5	-	-
	Mean	997	-	-
	Minimum	346	-	-
	Maximum	2800	-	-

Table 3. Interview participants' farming operation characteristics

Farming Operation Characteristics*		n	Percent	Average % of total operation
Crops	Corn	16	100	49
	Soybeans	16	100	34
	Alfalfa	4	25	7
	Wheat	4	25	7
	Sweet Corn	8	50	20
	Peas	5	31	8
	Other (Barley, Hay)	3	19	5
Livestock	Hogs	6	38	75
	Cattle	5	31	89
	Chickens	1	6	2
	Sheep	1	6	1
	No livestock	7	44	-
Farming associations/ organizations involved in	MN Corn Growers Assocation	14	88	-
	MN Soybean Growers Association	13	81	-
	American and/or MN Farm Bureau	9	56	-
	MN Farmers Union	3	19	-
	Pork Producers	1	6	-
	Cattlemans Association	1	6	-

*Respondents could provide multiple responses.

2. Decision Making Framework

Data analysis revealed a variety of factors that influence farmers in their decision making about their land, including both internal and external factors. Understanding these factors can guide resource managers when promoting adoption of conservation practices among local farmers. These influential factors were grouped into 7 main themes:

1. Perceived Environmental Benefits
2. Economic Considerations
3. Intrinsic Motivations
4. External Motivations
5. Farmer Values
6. Practice Appraisal
7. Trust

Perceived Environmental Benefits

Participants described a breadth of perceived environmental benefits that influence their decision-making including water quality benefits, soil health & productivity, wildlife benefits, and chemical use.

Perceived environmental benefits
Water Quality Benefits
• Conservation practices filter and protect water, slow drainage
• Downstream benefits of conservation practices
Soil Health & Productivity
• Conservation practices protect soil, reduces soil compaction, and improves soil fertility
• Conservation practices keep soil too shaded, do not provide erosion control with huge rain
Wildlife Benefits
• Increased wildlife habitat
• Hunting and fishing opportunities
• Benefits of planting natives and prairies
• Concern about livestock disease and pollinator decline
Chemical Use
• Minimize chemical use
• Manage fertilizer types or amounts; variable rate application/grid testing
• Use of chemicals for pests

Water Quality Benefits

The potential benefits to water quality were described by participants as a driver in their decision-making. The interviewees described benefits that included filtering water by way of conservation practice or tiling, protecting water, slowing drainage to prevent a rush of runoff, and providing downstream benefits. One participant discussed his motivation for implementing tile inlet alternatives:

> Hated all that crappy water going into the ditch, it's not buffered at all. What's coming down is going in, you know? Trash, sediment, nutrients, all the things you don't want going down there. It can't be good for the water down the way. Nitrogen, phosphorus, are a couple of probably the biggest ones in water quality, and dirty. It cleans up the water quite a bit.

Another interviewee described what water resources in the area mean to him: "Well it'd be water, lakes, rivers and streams I guess. And we have a county ditch system for draining our fields and stuff, so we'd want to keep them working and, and not polluted or any of that stuff. …I mean we all need to do our part and not pollute 'em."

Participants also talked about the importance of clean water, but recognized agricultural runoff *can* affect water quality. One participant shared his perspectives on water resources and the potential impacts from farming:

> We've seen what impact it can have. I mean, we've read the articles about some of the algae blooms. You read about some of the lakes or a few lakes if they have poor drainage practices going into them, you raise the levels of phosphorus which causes high levels of algae blooms which can really burn out a lake in a hurry and make it inhabitable to some species. So stuff like that is stuff you always keep in the back of your mind. Especially not only being a farmer, but being a sportsman. As a farmer too, just one thing we always like to say to people that talk about run-off. We're putting money into these fertilizers that are going there; we don't want them to go down stream. That's not our goal.

Several participants stressed needing to balance agricultural and water quality needs in order to maintain the farming industry, as described below by one interviewee:

> If we hold soil and reduce the addition of nutrients in the waterways, that's a plus, that's a good thing. It's right now with what we're doing, we're all probably contributing small affects but this is such a large basin and so intensely agricultured that it may never satisfy the people that watch water quality issues. That part of it I don't get too worked up about. We have to be very realistic.

Soil Health & Productivity

Maintaining soil health and its productivity was the predominant influence associated with environmental benefits. The soil was described as farmers' 'livelihood' – and protecting it meant you could continue your way of life. One interviewee shared this perspective when describing erosion on a neighbors land: "…get this to stop, because all of that sediment is going right down in there and it's dumb. Your productive farmland is going away. What you want to get money from, you're costing yourself." Another participant described his feeling when local farmers aren't protecting their soil: "anytime I see a soil that's just tilled black now in the winter time it just makes me cringe."

If a conservation practice protected soil - whether it be maintaining fertility, loosening compaction, or holding it in place to prevent runoff – it was a strong driver for adoption. Soil health was a major reason one participant adopted cover crops: "that is one thing we first tried it a couple years ago and we actually had a really good experience with it. And the fact that we saw not only increased soil health but increased yield because of it, and just overall soil structure, it seemed like it really helped." Similarly, another interviewee described the soil benefits from cover crops: "I want it to loosen up the soil, leave some vegetative growth there so it's gonna improve the tilth of the soil, and then because there's a hassle of going through it to do it. But at the same time if that soil isn't blowing away, that's kind of an unseen advantage of it too."

Practices that participants felt kept the soil "too shaded" and prevented spring warm up were noted as being a constraint to adoption:

> I thought about just going to no till and I mean it always intrigued me and crossed my mind but because we are in these heavy black soils and it just doesn't warm up sometimes in spring, it wasn't necessarily the best option on corn ground especially, corn stalks. People have tried it but it's been very limited. Nobody stays with it because it doesn't work that well.

Keeping soils well drained is very important so practices must not interfere with drainage in a way that impacts crop production. One interviewee described this as, "if we have a lake in our farm field and they have less water down in their lake or river that they live by, I would rather have less water in my field. And give them more." Another participant expanded on this idea and why field drainage is so important:

> The concern is how to balance out the needs of agriculture and getting surface water off production. So how we deal with excess surface water is our biggest concern…if you are going to have productive soils, you need to tile it. So then there gets to be a controversy on draining and tiling and all those kind of things and how that affects downstream….I have to have a subsurface system that takes the water off the field before it kills the crop cause the crop can only be underwater in these areas for a minimum of 24 hours, that waters got to be gone.

Several participants felt it was important to note, however, that no matter what conservation practices you may have in place, if a very large rain comes, you *will* have erosion no matter what: "If you get a ten inch rain, it doesn't matter what you do. And that's what some of these people, they believe so firmly that if it would rain that much that we should still be able to control what happens out here. And I'm sorry if it's doing that, you have no control. When everything is lakes everywhere you have no control."

Wildlife Benefits

Wildlife benefits, such as increased habitat for the benefit of the animal, or increased hunting and fishing opportunities as a result of wildlife presence, was another driver of decision making for some interviewees. When asked about the important considerations when making decisions about conservation practices, one interviewee described this: "well it sort of goes back to erosion, water quality, and you can't forget the wildlife out here. I mean I do enjoy seeing some wildlife out here." Another participant shared the advantages of planting the buffer strips on their farm: "we should be getting more pheasants and…deer and turkey, we have some out there…and it gives them more places to live."

Participants also shared concerns that affected potential wildlife benefits, like the decline of pollinators and livestock diseases like bird flu. Connections to wildlife and other environmental benefits were made – like clean water being important to healthy fish populations and fishing opportunities. When asked what local water resources mean to one pair of interviewees, they responded, "Well, fishing! We love to fish and hunt, so we want the water to be good as what it can be. So, yeah, clean water is good water."

Chemical Use

Reducing the use of chemicals (both nutrient applications and pesticides) was discussed as a perceived environmental benefit. New technologies, such as variable rate application and grid testing, were important tools to reduce the amount of fertilizer needed or to determine what types are a good fit. One interviewee described the technology he uses to reduce chemical usage:

> We do variable rate technology, we do soil testing, we do tissue testing on the plants so we are not over or under applying, probably more so over applying nutrients to our crops. We spray our fields with herbicide; we have a special monitor where it helps prevent you from

over application and the fact that you've got auto-swath so you're not over spraying if you forgot sprayed some area.

Similarly, another participant described the improvements to his operation: "we're soil testing more, we're doing grid sampling now, we'll be variable rating our fertilizers based on these soil tests so we'd just be putting fertilizer where we need it and not where we don't. We're making all of those improvements. So going forward from here. So we're trying to conserve fertilizer and soil and water and all that stuff."

Economic Considerations

Economic considerations were a predominant theme throughout the interviews that had a major influence on farmer decision-making. Major dimensions of the economic considerations theme include adoption & maintenance costs, declining profit margin, cost share opportunities, and maintaining production level.

Economic Considerations
Adoption and Maintenance Costs
• Equipment and machinery costs
• Practice is expensive; inputs are expensive
• Practice saves money; minimizes expenses
Declining Profit Margin
• Concerns about profitability
• Need to farm more acres to stay competitive
• Unpredictability of markets and inflation
• High land costs and taxes
• Need diversified farm
• Need off farm income
• Health insurance expensive
• Need to stay educated
• Hard for new gen to compete or get started
• Farmers choosing money over environment
Cost Share Opportunities
• Financial incentive to adopt
• Need to be compensated
• Should reward individuals who adopt
Maintaining Production Level
• Farming is cutthroat
• Large corporate farms outcompete
• Need to adapt and change
• Practice maintains or increases yield

Adoption & Maintenance Costs

The costs associated with adopting and maintaining any conservation practice, or farming practice in general, had an important influence on the decision-making of participants. Profitability was at the heart of every discussion around conservation practices, as described by this participant: "ultimately, everything kind of comes back to an economic thing. Economics will drive decisions long before government regulation and public perception. And sorry but that's just kind of the rule now, economic drives the decisions." Another interviewee shared his perspective on conservation practices as simply, "any program has to walk hand-in-hand with the profitability and productivity of farmers."

Adopting new conservation practice or maintaining current ones carries with it new equipment and machinery costs, as well as the additional inputs sometimes required. "It takes more patience and some up-

front investment. You've got some seed costs, you have more machinery cost for planting/seeding," described one participant. Another interviewee shared the new costs that have to be considered before adopting a new conservation practice:

> Anytime you do conservation practice, it always costs money to get into that…it costs money to buy that…if you were to buy seed to plant this cover crop, I mean its 125 dollars an acre. So that's pretty huge itself. And then if you are going to put in filter strip or erosion control strip, I mean it's expensive to have somebody come out there with an excavator and do the work.

Some practices are more expensive to implement because of those costs, and the need to maintain profitability drives participants to minimize as many expenses as possible. However, some participants felt the adoption of a new conservation practice saved money in the long run: "well there's this water quality program that we signed up and in order to qualify for that we needed to change our fall tillage system to leave more residue on top and, but now that we've done it there are a bunch of advantages to it. We used a lot less fuel and it went a lot faster, so between time and fuel savings."

Declining Profit Margin

An overall declining profit margin also emerged as an influence on decision-making of participants. Farming continues to become more and more competitive, leading participants to increase the acres they are farming, diversify their farming portfolio, and even pursue off farm income to make ends meet: "the reason we went off the farm or working off the farm so it was cheaper for us to hire the neighbor to combine than to own the combine ourselves." One interviewee elaborated on how the modern machinery drives up cost: "nowadays machines get bigger and bigger. Now people can't afford to let the tractors to stand still on a Sunday. Now they work 24 hours a day, 7 days a week."

Another participant described his attempt to diversify his farming operation in order to stay competitive:

> We were looking for something that's totally unrelated to farming so that the cycles of farming…a lot of people in farming tend to get a second business that's still in the agriculture industry. When agriculture hurts, that business hurts too so we were looking for something just totally removed…something that'll keep [us] busy in the winter too.

Interviewees noted several factors that contribute to this including inflation, high land costs and taxes, expensive health insurance, and the unpredictability of markets. When asked about worries or concerns in today's farming industry, one participant said: "I'd say probably like what I hear from a lot of my cohorts, the uncontrollability of the economics of ag production is always a stressor. I would have to say you have a tendency to take it personally." Another interviewee elaborated with his perspective, "basically, the last couple of years we're in cost saving mode. So wherever we can cut. I mean I'm doing things totally different than three years ago just for that fact because we have to cut every extra we can cut to try to keep paying the bills."

In order to stay competitive in the industry, participants described the need to stay educated and up-to-date: "you have to keep up with the technology of what's happening today. I mean it has changed in the past years

since when I started to now. You had to keep upgrading or you got left behind. They don't make the old style which you used to use; you had to upgrade all the time to stay with the program."

Interviewees also described how hard it is for new or young farmers to get established and compete in today's industry because of the high costs of starting and the low profit margin. One interviewee described this difficulty:

> One issue that comes to mind is the challenges for the next and or younger generation to get into farming. The size of the farms has become so much larger than it has in the past. It's a very capital intensive occupation to be in and it's very challenging for the next generation to come into it because the farms are so large and every person just cannot come in. It's just very difficult for a person to come in and obtain financing to get started. And the competition is extremely intense.

Cost Share Opportunities

Current and future cost share opportunities emerged in the decision making framework among key economic considerations. The availability of financial incentive to adopt a conservation practice was an important influence for producers as plainly described by one participant: "if we did not have some financial assistance, I mean I'll admit that there would not be as much conservation practices taking place as there are today." Another interviewee said, "yeah if you want to pay me to put this in grass and not farm it, and that makes sense because I had to buy the land, it's not free land that I have," when asked if he would be more likely to adopt a conservation practice if he had a financial incentive to adopt it.

Similarly, interviewees felt they should reward individuals who adopt voluntary practices and be fairly compensated for any practices mandated upon them. The idea of being compensated for practice adoption came up frequently when on the topic of buffer strips: "no one is getting paid. If they would measure this and come up with a figure, I think the whole argument would disappear. Because the way it is now, it's a taking without compensation."

Maintaining Production Level

Maintaining current production levels was another driver of decision-making for participants. At the minimum, any conservation practice interviewees were considering had to not reduce current yield levels, or better - increase yields. One interviewee when asked about the important considerations when making decisions about his farm said simply, "Number one, you want to produce the best yield." Another participant described the balance he works to achieve to constantly maintain or increase yields without having a detrimental impact on his farm:

> We're always trying to tweak things to try to increase or maintain production while at the same time not use up our resource in the process. I would have to say that there is an opportunity to increase production at the cost of the resource; we would probably opt to not go there because ultimately, if the resource is destroyed or used up, then we've destroyed our economic viability. If it means we can't maintain our economic viability I wouldn't say we're going to automatically destroy the resource just to extend our survivability for another short

> period of time. There's nothing to be gained there either. But on an equal basis, if we can make a decision where we're not going to sacrifice the resource and yet at the same time we can increase our economic advantage, then it's a win – we'll go in that direction.

Participants described the current farming industry as "cutthroat" – thus the need to continually adapt to new technologies and change practices to stay modern was an important influencing factor: "out here it's all cutthroat. Backstabbing is all it is, nobody cares about anyone else. Not like it used to be many, many years ago. If I know somebody really well, I won't try to step on their toes and they won't do it to me. But most of the others, I can name a few in the area, that could care less. They're all about #1, that's how it is." Similarly, when another participant was asked what he would change about farming today he said, "that's a hard question because you can never go back to the way it used to be. It was a lot more simpler back when we were kids, everybody had 160-240 acres, cows and diversity for income...it was just kind of fun being out there. Now it's just more of a dog eat dog world. It's not fun like it used to be."

Interviewees felt large corporate farms were outcompeting family farms and only cared about production level at the expense of everything else:

> I think they're moving it towards bigger and corporate farms which I don't think is a good but maybe it is, I don't know. I don't see it's good because I don't think economically it's going to be good because they don't have the care about the land like the independent farmer does, is my feeling. They're in it for business and just hurry up and get through it where an independent farmer, or smaller farmer, cares about it. He takes care of it and how it gets done.

Practice Appraisal

The perceived efficacy and suitability of specific conservation practices (which comprise to make the theme practice appraisal) were important factors that influence participants' decision-making.

Practice Appraisal
Practice Efficacy
• Effectiveness of practice; maximizes efficiency
• Lack of practice effectiveness
• Need for more evidence that practice is effective
Practice Suitability
• Not "one size fits all"
• Practice feasibility for farm
• Suitability to climate and weather conditions
• Contracts for crops and seed types

Practice Efficacy

Whether or not participants felt a practice would be effective in its intended outcomes was an important influence on their decisions. Participants had to believe it would work, first and foremost. One participant described his unwillingness to try a practice after seeing it didn't work for another peer farmer:

> The only thing that I seen from around here that's bad is like, no till because our soils are so dark right here that, it just doesn't dry out in time. So I would think strip till would be fine here. But I know about five miles away a guy used to do it, he went broke. One year we had a wet late spring and that's all it takes, one bad year. Even with the insurance and that, if you have one really bad year, you might not be able to get going again.

Several participants discussed needing more data evidence that a practice would work for them before they would adopt it. When asked if financial assistance would make one participant more likely to adopt a practice, he responded, "yeah I suppose it would help but boy, somebody has to show me the methodology and the technology to get it done." One interviewee described needing more data evidence before he would adopt cover crops as a conservation practice:

> I would have to see a lot more research on the benefits on either holding nitrogen or my ability to manage lower phosphorus for a soil test because of a much more vigorous rooting system or mycorrhizae system, that's not been quantified very well I don't believe. There's a lot of people who I call "true believers" who just throw this stuff out there and it's supposed to everywhere but there has to be a lot more research and on-farm demonstrations.

Interviewees also shared the importance of a practice increasing their efficiency. One interviewee shared his perspective on tile inlet alternatives and how it increases his efficiency: "…it's actually better ground use…and so it's more efficient. Any way I look at it it's more efficient having that area of ground that's not productive because it's a rock then to have a pipe there that doesn't take it quite as fast as a hole in the

ground...you build them so that you can farm right over them." When asked if there was anything he didn't like about that practice, he responded, "No. No I think it's kind of like sliced bread…to me it just makes sense." Another participant felt similarly about the increased efficiency of tile inlet alternatives: "It's actually made crop production on those fields easier or more efficient because you don't have to manage around those open inlets. No flags to drive around, no weed problems around the inlets because of something you've got to drive around."

Practice Suitability

Not every practice makes sense for all situations, so whether participants felt a practice was suitable had an impact on their decision-making. Interviewees noted that the practice needs to have benefits to them personally, which is different for every farmer. Participants frequently mentioned that practices are not "one-size-fits-all". Whether a practice was feasible for their individual land was important to evaluate. Many participants said their reason for not adopting a practice on their land was that it just wasn't feasible on their ground. One participant described this about cover crops: "the problem I see is getting them established. You get down to Iowa, Illinois, Indiana, Ohio, you have a longer growing season and a lot of them, they can see them after they're done with the row crops and they're fine. You can't do that here…I thought about it but I just don't see any part feasible to do it."

Weather conditions and climate played a role in determining if practices were suitable for participants, as described by one participant:

> A lot of the biggest barriers have to do with where we live. We live in Minnesota, where it's a short growing season, it's cold and it's wet. If some of those things would be different we would have we would have a little bit more breadth of opportunities but we have to do something that warms up our soil, gets suitable for planting, which does help us extend the season as much as possible because the more that water sits there, the later we can plant. The colder that the soil is the later we can plant, and we want to plant early, we want to get something growing sooner in the year. We don't have a consistent season too, sometimes we could plant in March, sometimes we couldn't plant until May, so if we're planning for something we have to know that it might not get in until two months later, and we're already short-seasoned.

Similarly, another interviewee described why he didn't believe cover crops were a feasible conservation practice: "then it has to be feasible, we're sitting up here in the northland and we're supposed to harvest a crop and get a cover crop out? We don't generally have enough environment to make that grow and green up before we get freeze down and then right away we're starting up in the spring, very quickly trying to get the next crop back in place."

Other aspects of evaluating practice suitability included whether a farmer has contracts for the crops he is planting and what the types of seeds are that will be used. One participant described planning for his seeds and crops: "I'm an agronomist so I actually think very deeply about all of these things everyday… we have partners, I mean I rely on experts in my retail that I can rely on for pricing. We've already secured all the inputs for 2018 and we have a plan in place. We checkout out all the alternatives for crop production, fertility, and certainly I purchased my seeds already and we've fit those to the land."

Intrinsic Motivations

Intrinsic or personal motivations emerged as another key theme that played a role in the decision-making framework of farmers. Influential factors in this theme include awareness, concern, personal responsibility, collective responsibility, and perceived ability.

Intrinsic Motivations
Awareness
• Increased awareness of water quality
• Perception that water is not as clean as historically
• Awareness that clean water and safe drinking water are important
• Awareness that Clean water important for fishing
• Awareness that soil conservation and field drainage are important
• Awareness of water pollution (e.g., local algal blooms, lack of good quality recreational water)
• Awareness of the impacts of agricultural and urban runoff on water quality
• Perception that Minnesota river is naturally dirty and runoff is normal
• Perception that there is too much water in the Minnesota River
• Tradeoffs between agriculture and water quality needs
Concern
• Lack of concerns about water quality, groundwater and flooding
Personal Responsibility
• Farmer and landowner responsibility to take care of land and water
• Farmers need to feed people
• Sense of 'our land, our right'
Collective Responsibility
• Everyone is responsible for water; need to stop blaming farmers for water issues
• Local government is responsible for protecting water
• Need to address water quality locally
Perceived Ability
• Practice difficult to do; tough for large farms
• Practice needs maintenance
• Practice easy to do
• Learn about practice from trying
• Innovative technology & precision tools increase ability to use practice

Awareness

Awareness of current issues – especially related to water quality – was an internal motivator for decision-making. Participants felt like there is an increased awareness of water quality among their local community and farming community, and that safe drinking water is important. One participant shared his perspective on increased awareness in his community: "farmers for the most part are pretty aware of water and how important it is and are trying their best to protect it in what they can do….I think we do a pretty good job. More than we get credit for sometimes."

However, there were differing opinions on what the current quality of local water is and what the issues are. For example, several interviewees described local waters not being as clean as they historically were, while others described the Minnesota River as being naturally dirty and farming practices not being a major contributor to that:

> I can't believe that the Minnesota River was ever this pristine trout stream that everybody thinks it should be. I mean Louis and Clark said it was the muddy Mississippi. This erosion was going on when buffalos roamed the area and the Lake Agassiz broke loose and carved out the Minnesota River bottom. That thing never ran clean – that is not a mountain stream with pristine water, so we need to have baselines to measure off that made sense. You can't turn it into something that it was never meant to be. I mean the upper Mississippi, maybe that looked pretty clean, but once it got down to this rich fertile black ground that's been evolving and changing, what does that baseline look like? And I think that's what we need to establish of what's reasonable and what's not reasonable.

Issues including local algae blooms and no good recreational water were used as examples for water not being as clean as it once was as described by one participant: "well they talk about swimmable, fishable and drinkable, you know, and I think about growing up, we would swim everywhere. I don't think I'd jump in a lake anywhere now, so from my perspective, things aren't as clean looking in this part of the state."

Several participants described runoff as normal, while others viewed the Minnesota River as having too much water due to runoff. One interviewee described this issue: "we're reaching a point where there's got to be some balance downstream the guys are screaming they can't take any more water or we're trying to get rid of water so are we going to have to go to retention areas. And who's going to pay for those?"

Nearly all interviewees felt urban runoff is an important issue being overlooked: "I think the runoff and the amount of nutrients that are going into our water systems from our developed and urban areas don't get as much attention as they should." One interviewee described this further when asked about who should be responsible for solving water resource problems in the watershed:

> I think everyone contributes to it so everyone should be involved in it. I'm not picking on anybody, I see the town people saying "oh watch the farmers dumping all that fertilizer on their ground". Well I look at it the other way and you watch a town person fertilizing their lawn just so they can have a nice green lawn and they have a half of bag of fertilizer left over, what do they do with it? They just go spread it out here right? Well a farmer doesn't go to town and buy an extra 3 ton of fertilizer just because I want to put more on. They only put down because that's all they can afford. I'm not picking on the town people but everybody has to be - farmers, town people, whoever – we all have to bite this bullet and turn it around because it's not good.

Concern

Concern for water quality issues, similar to awareness, also played a part in the internal motivation driving decision-making. Many participants noted they were not concerned about local water quality, using what

they've seen on their farm as evidence: "actually no [we are not concerned], we've been on this farm for a long time and our water hasn't changed."

A few interviewees noted they were not concerned about groundwater in the area. Others voiced no concern about flooding in the Minnesota River. One interviewee shared that runoff and local water issues might not be problems, depending on the framing:

> Some of the other general just ongoing things, regular rain runoff or what have you, I guess, I mean is that normal or is that a problem? What makes it a problem? So, that's why I'm curious what you're considering a problem. None of us want our rivers and streams polluted, and a lot of the sediment and stuff that is in our rivers from stream bank erosion. I mean, it isn't my field that's going in there, it's from the river eroding the sides of the bank as it goes down. That's why the Minnesota River is so dirty. I mean it isn't my field in there, it's the spring banks that are a lot of it that's in there. So is that a problem or isn't it? And what can you do to fix stream bank erosion all along the river? I don't know, so…it would depend on the problem – what you're calling a problem.

Personal Responsibility

Participants described a range of factors that comprised their personal responsibility, which influenced their decision-making. First, farmers need to feed people, so they feel a responsibility to produce at the best yields they can to help feed the world. One interviewee shared this perspective when asked about what local waters mean to him: "not a lot quite frankly. I cross the Minnesota River almost every day when I go to Le Sueur. It is what it is, we feed people, we continue to feed people…. I was in extension, I worked the whole water quality interface with agriculture. I understand all the issues, I'm just only going to serve one master."

Interviewees described an individual landowner responsibility to protect water. Many participants felt strongly that all farmers have a responsibility to take care of their land: "you can't blame someone else for something that you do, so you have a responsibility as a landowner to take care of the land." Similarly, another interviewee said, "we obviously play a big role. And the role will not get any less either. We have to do our part. I mean everybody's responsible and I say that about farms we have to do our part."

A few participants also described a feeling of ownership and responsibility – if it is the farmers' land, it is the farmers' right to do with it as he/she wishes. When asked about obstacles in the way of healthy water resources in the area, one interviewee said, "the farmers want to farm their land. I suppose that's the biggest obstacle because it's hard to get it out of their hands and revert it back."

Collective Responsibility

Similar to personal responsibility, participants also were motivated by a collective responsibility. Interviewees felt ***everyone*** played a role in water protection, not just farmers, so everyone should be held responsible:

> I think it's a whole system wide approach - I mean the farmers deal and he doesn't want to wreck his ground, but on the other hand he has to get rid of the water otherwise he has huge economic loss. So if somebody thinks that the waters coming too fast, if that water needs to

> be retained somewhere, well then everybody's got to pay for that…the responsibility falls on the whole population.

Participants felt a continuous blame directed at farmers for water issues: "that's my big problem with all of this. I think we are doing a lot compared to other places and other things, to try and do our part and we still get blamed."

Interviewees suggested that the local community and local government should address and be responsible for protecting water:

> I think it's better off in the local area. I think it's the soil and water thing. I don't think the DNR really has our best interest in far-reaching things. I think it's the soil and water conservation district that should oversee it, I really do. The further you get away in government from a place, you don't even know what's going to, and then you're making decisions based on what? You're in Florida? In Minnesota they're completely different. Local level is got to be way it's got to be done.

Similarly, another participant shared his view on why local government is best suited to address water protection: "they were talking DNR would probably be patrolling [buffers] this but they don't have enough man power to do something like this. I think it should probably still be up to the county, each county themselves. I think that's where it should be because rather than like the state of Minnesota, sticking everything down our throats."

Perceived Ability

Lastly, an important part of internal motivation in decision-making was participants' perceived ability to adopt a practice. The level of difficulty in implementation was one factor affecting perceived ability, as was the level of difficulty in practice maintenance. Several participants described particular practices as being tough to implement/maintain on a large farm basis and were more geared towards smaller situations: "if you're asking what reasons a crop producer might be reluctant to using cover crops, I would have to say that it doesn't lend itself as well to big agriculture. It takes more hands-on management, you can't just do a one size fits all application on a farm when you're using cover crops."

Innovative technology and precision tools improved participants' perceived ability to adopt or maintain a conservation practice. However, a few interviewees noted that the only way for them to actually know if they have the ability to adopt a practice is to try it themselves, as described by one participant: "I would still evaluate or do some scrutiny to the whole system to determine if it's something I feel there is potential to incorporate long term.….If I think it's something that we maybe could incorporate or some parts of it, I would be very incentivized to try it."

External Motivations

Participants also described several external motivations that influence their decision-making including regulatory influence, effective community engagement, public perception, and social influences.

External Motivations
Regulatory Influence
• Need flexibility in implementation; too much paperwork • Political concerns; too many regulations and "red tape" • Perception that local agencies are understaffed, underqualified and undertrained • Easy to work with local agencies
Effective Community Engagement
• Need for more effective communication (e.g., get everyone on the same page) about issues and community engagement • Farmers should be consulted for opinions and need to stay involved in community issues • Lack of strong relationships (e.g., people do not know their neighbors)
Public Perception
• Perception that the public does not respect farming and farmers • Appearance of farms important
Social Influences
• Learn about farming and conservation from conferences and meetings, equipment dealers, farmer magazines, other farmers, watershed staff, and SWCD or NRCS • Rely on multiple sources including suppliers and salespeople, agronomist or crop consultant, family, farm manager, and accountant

Regulatory Influence

The variety of factors related to regulation influenced participants' decision-making. First and foremost, participants believed there are too many regulations affecting the Minnesota agricultural industry – in particular the new buffer law. Several participants shared the perspective that they have no problem with buffers themselves, but more the forced 'one-size-fits-all' implementation of the rule. When asked about concerns with today's farming industry, one participant shared his discontent with regulatory influences:

> There's not enough of us to speak for legislation. It will just get passed because there is not enough anymore, enough people on the farming side of it. Which it's already doing that with some of these buffer stuff that they're fighting. It was all thrown out there because there's not enough on the farming side to fight any of this. Because there's no common sense to it. It was just a plain old, this is the way it is and it doesn't matter what's going on, this is the way it's gotta be. I don't like that. If it's fair I'm all for it, but it's just not fair. I'm not for it.

One interviewee was very straightforward with his perspective on the buffer law: "It's one more way for the governor to stand on our neck out here in rural areas so that's just what it is. He's offering us up as a political sacrifice to all of his greenies and environmentalists on the other side."

Interviewees stressed the need for flexibility in the buffer law implementation, as well as other regulations. One participant described why the implementation was flawed in his mind: "heaven knows we have got enough productive land that it's not so bad to have some buffers out there. But it goes back to economics…why should somebody be required to give that up with no compensation? That's where the push back comes from on this whole buffer idea. So it's not that the buffers are bad, it's how it was implemented was bad."

Another interviewee also shared why flexibility in implementation was needed because in some areas the required distance is not big enough to serve its intended purpose:

> …those areas that have depressions in the field on a hillside, in a gully or whatever, yes, water runs directly off the field and into the ditch. There we need a buffer strip, and quite frankly we need a bigger one than 16 feet in some places, but that's what the law says: 16 feet along county drainage ditches. You probably know this. 30-50 feet or whatever in other area, so those parts of the thing probably, but even that won't cover it in some of the places, even the required width. Flexibility is what's needed, flexibility not just the rigid rule. A senseless rule that says 16 feet.

Along the same vein, participants described the amount of paperwork associated with participating in certain farming programs (locally or federally) as being a barrier to adoption: "then with my CSP too, there is so much paperwork, I don't know why you need all that paperwork. Can't it be simple? I mean, I have a folder like that thick of all the stuff. But that's the way it is. If you wanna do it, you gotta go through that." One interviewee shared an example where the cost share participation was so tedious that it deterred a farmer from participating in the program, but he still adopted the practice:

> I heard from others that have looked into using a cost share for a manure lagoon or something that the cost ended up being about the same. So if you'd use their plan but then they cover apart of the cost, it actually ends up being the same cost to you or if you do it yourself and kind of do your own design…but yeah, sometimes it's just the extra paperwork and the extra hassle, if the cost is going to be the same you'd just as soon do it on your own.

The relationships participants have with local agencies was also discussed. Many described why they like working with local agency staff: "very easy to work with. Willing to come out and answer questions if you have them", and "seem to be very informative…wanna help you out, they wanna see you do things right."

However, several interviewees shared complaints about those agencies including that the agency is understaffed and undertrained. One participant said, "I would say that in general they need to extend themselves and become better sales people. They need to go where the farmers are," in reference to his experiences working with local NRCS and SWCD staff. Another participant felt similarly:

> They probably could have been a little more knowledgeable. By no means am I trying to throw them under the bus or anyone under the bus by making that statement but these guys, at least in our county, they're farmers and I don't know how much continuing education they do. I think they do some but I was a little disappointed in that I felt they weren't as

knowledgeable on some of the issues or some of the topics that we have discussed in the past.

Effective Community Engagement

The need for increased and effective community engagement emerged among external motivators affecting decision-making. Interviewees described a current lack of effective communication and engagement in their community. The desire to get everyone on the same page and to participate in discussions was mentioned by several participants:

> It's a process and just if we ever get to a point where we think "okay now we're where we need to be and now we can just coast" then we're going backwards. We always need to keep working at it and I don't think it does any good to literally throw anybody under the bus on any of these issues because then they're going to disengage. And the better job we can do of keeping people engaged and keeping them trying and striving to do better, the better chance we have of making improvements and getting to a better place than where we are at.

Participants also wished that those making decisions that affected their community would consult farmers for opinions to help inform those decisions. When asked about the keys to achieving healthy water resources locally, one participant said, "consult with the landowners and the operators for their opinions; they know that land better than anyone. They're on it; they see first-hand what is going on."
Participants shared the feeling of not knowing their neighbors anymore – like farming families used to – and how that constrains effective communication and engagement. One interviewee elaborated on this feeling: "I know back in the days the farmers we're a lot happier than they are now because you had a good neighborhood. Everybody helped each other where now you don't even know your neighbor that's out there."

Public Perception

The public perception of farmers also played a role in participants' decision-making. Farmers want a good appearance to others – they want the public to think they are doing the right thing on their land. One participant, when asked about the important considerations when making decision on his land, shared his desire to have a good appearance to others:

> …it goes back to how am I taking care of my farmland, my building site? Am I positioning it for the future? And I see that as being fairly important because I want the farm to go on whether I'm farming it or not. And I want to see whoever comes by can say, 'that's still a quality farm.' That [participant name] did a good job of taking care of it and nurturing it over the years. So that's how I would see that.

Many of the interviewees felt the public doesn't respect farming or farmers, mostly because they are uniformed of that lifestyle. One interviewee shared his perspective: "we as farmers, and I may be speaking for myself, I think 95% of us try and do our part to protect our water quality and prevent soil erosion. We want to be able to farm and enjoy our farms, we don't necessarily want to be dictated to, telling us this is how you have to farm. We need to be treated with respect."

Social Influences

Participants described a variety of individuals and groups that influence their decision-making on a regular basis. Several sectors of the agricultural industry influence their farming decisions, including agronomists, crop consultants, equipment dealers, suppliers, and farm managers. One interviewee described the breadth of individuals he consults with on a regular basis to make decisions about his farm:

> We've got a crop consultant that we usually sit down with during the winter and kind of lay out a plan as far as what we are going to use for chemicals, what we're going to use for seed. Also the main person that we buy seed from, kinda pick his brain as to what seeds, as far as like corn seeds, work best on what type of land. I have a dairy consultant that we work with as far as nutrition. And then the crop consultant also goes through manure results and gives us a plan as far as what manure we're going to apply, at what rates, and also commercial fertilizers.

Participants' also relied on tax consultants or accountants to assist in financial decision-making. Local agencies, including SWCDs, the NRCS, or watershed districts, also provided information and programming that informed decision-making. Interviewees mentioned learning frequently from farmer magazines: "we've been reading about them…you see it in a bunch of farm magazines. You go back three years ago, everyone was talking about cover crops." Similarly, many participants mentioned learning from conferences and meetings geared towards farmers: "I try to attend management seminars every year as time allows. You get to rub shoulders with other producers and also hear presentations from agronomists, University personnel."

Family of participants' were another important group that influenced decisions. Many participants' spoke of other farmers being a major influence on their decisions:

> Bottom line is farmers sell to farmers. It works that way in our seed business. If we have a really good customer, he tells other customers about us and that's how we grow. And I think that same thing applies to conservation practices. I think people hear, read, or investigate things a bit on their own. But really when it comes right down to it, they pretty much are talking to other people about it…. But really what it comes down to - it's their neighbor or their acquaintance that they know from someplace that they trust or admire and it goes up from there.

Farmer Values

Values that farmers hold also emerged as a major theme influencing decision-making. Farmer values include a stewardship ethic, family values, personal satisfaction, independence, and livelihood.

Farmer Values
Stewardship Ethic
• Perception that current way of farming is not sustainable
• Investing in the land and not being wasteful important to farmers
• Better conservationists than previous generation
• Farmers won't ruin their own ground
• Don't farm land that shouldn't be farmed
• Lack of personal attachment to the land
• Care about more than just money
• Some farmers are not doing the right thing; young farmers do not care about the land
Livelihood
• Farming as a means of livelihood, to have the necessities to live, and increase comfort
Independence
• Flexibility and independence of being a farmer
• "Being your own boss"
Personal Satisfaction
• Enjoyment of being outdoors, plants, flora, wildlife, and watching crops grow
• Enjoyment of the hands-on work, farm equipment, and the challenges of farming
Family Values
• Family heritage
• Simplicity of life in previous generations
• Good place to raise a family
• Continue to farm in future years

Stewardship Ethic

A strong driver of decision-making for participants' was an ethic of being a good steward to the land. Participants' frequently discussed this as caring about more than just money and investing in the land, as taking care of the land means they can continue to farm productively: "we do respect the land here that we farm and want to take care of it, I really believe. So that's pretty huge to me, to make sure we take care of the land and be good stewards of the land." One interviewee shared his vision for the future of farming and how it parallels his stewardship ethic:

> I think there will be a niche for young people coming into agriculture that are able to meet the vision or ethics of the landowners. We have some sons and a couple of them want to farm and our business model would probably be that you're not just going to go out there and compete on land with high land rent costs because that's just really tough. But could you sell a vision to a landowner of stewardship and conservation and whatever that means, is it

> cover crops, is it more residue, is it no till or ridge till systems or strip till? So I see that as being an opportunity but it'll be different based on what people value. Right now, people value dollars. The people that own the land down here value the dollar bill; certainly there are relationships built on family and friendships and the land as a resource and taking care of it, because we communicate that with our landowners. We don't talk about the price of the land, I try to tell them what we've done, why we're doing it and how we're taking care of their resource and over time hopefully I can build that stewardship ethic within them too so that it isn't just a conversation about dollars 'cause someone else will always pay the dollars.

Interviewees described situations where land shouldn't be farmed and that this stewardship ethic means knowing the difference and not farming those areas. The stewardship ethic also was reflected in not being wasteful with resources, like chemicals or water, or ruining your own ground. One interviewee in response to being asked what 'conservation' means to him, shared his definition and why it is so important:

> Conservation: it's about protecting the resource so my number one resource protection concern is the productivity of the land. To hold it, maintain it and build it. That's going to be the first thing that I actually think about in conservation because that's an ethical issue related to food production for future generations. If you're farming hills and your soil is bare and you continue to lose top soil, that's a huge ethical issue for me because you're basically pretending like you're the last generation that's going to farm.

Several participants believe that the current generation of farmers are much better conservationists than their fathers were, just because technology and new information allows them to be. Participants also shared that there are a small number of farmers out here who are ***not*** doing the right thing, in terms of stewardship. One participant shared his perspective on this when asked if he was concerned about water resources in the area: "well I think it's only going to get worse down the road, I won't argue that. That's why we have got to try and do it now. Some people really don't care if something runs into a ditch, whatever. They say most do, but there's always a few in every bunch that's kind of a bad apple that spoils it for everybody else."

Some interviewees felt young, new farmers don't care about the land in the way older generations do. One interviewee expressed his frustration at the young farmers who in his mind don't care about the land:

> I know from some of the younger farmers that I know and some of others, I'm just going to say it the way it is: they don't give a shit. It's like they don't want to try their best and it's like they don't even like it. They don't even research anything, they don't look at anything, they don't look at the soil, they don't look at the environment. And they're worried about the paint color on their tractor more so than they are anything else.

Others attributed this lack of ethic to large farmers and not having a personal attachment to the land if you farm thousands of acres: "I think sometimes if farms are too large, there isn't a personal attachment to that… it's just a dollar driven business. As the conservation part of it, is it can't be just dollars. And so helping and keeping the family farmer is a better conservation than big farmers, they're just after big business."

Livelihood

Maintaining participants' livelihood as a farmer also influenced their decision-making. Most had been farming for most of their lives, so ensuring they could continue to farm influenced their decisions. One interviewee said about being a farmer as a living: "it's just something that gets in your blood; to me it means a whole lot."

In order to maintain their livelihood, participants described the need to make enough money to have the necessities to live or to increase the comfort of their current way of life. Participants were asked how they evaluate the success of their farm operation. One interviewee said simply, "I guess that you keep doing it again the next year, doing what you like to do." Similarly, another participant said, "given the times that we are experiencing presently, we still have a warm home to be in, plenty to eat, so we have the necessities."

Independence

The independence of being a farmer was an important value that drives participants' decision-making: "we like the freedom, we like the ability to make our own decisions." Interviewees valued being their own boss. When asked what he likes about being a farmer, one interviewee said: "independence. I don't like people telling me what to do." They also shared that they valued the flexibility associated with being a farmer and making your own schedule.

Personal Satisfaction

Participants shared a variety of other factors that they derive personal satisfaction from in farming and drive their decisions. Interviewees shared their love of being outdoors – and enjoying the plants, nature, and watching crops grow, as one participant shared: "the farming is just going out there and planting the crops and seeing them grow and it's your pride. It's a big accomplishment at the end of the year."

Many participants also love wildlife and enjoyed that farming gave them an opportunity to see it and even provide habitat to increase those viewing opportunities. One interviewee described what he likes about being a farmer: "I like nature, I like watching the pheasants, I like watching deer and the wildlife and just everything about nature. And it involves nature for me than anything and it just…I like that."

The challenges associated with farming, and working through them, along with using the farm equipment were other enjoyments shared by participants. Another participant identified his reasons for becoming a farmer: "The ability to make my own decisions I guess, being able to work outside. Those are some of my goals that I identify when I was in the discerning stage of trying to identify a career path. I guess those are the primary things, I like hands-on. I like to see things grow so production is very satisfying to me."

Family Values

Family values were intertwined with the values participants shared as a farmer. Being a farmer was part of their family heritage – farms were often in a family for multiple generations and participants hoped it would continue to stay that way. Participants shared their desire to continue to farm for future years to keep it in their family: "I farm with my sons and my grandfather started it so definitely multigenerational…hopefully it's

definitely going to make the next generation someone that I haven't met yet they're probably a real need that's still going. So keeping it going is kind of a big deal."

Several interviewees shared why they felt the farm was a good place to raise a family: "there's something about it that keeps you closer to nature and God everyday you're out here. That's kind of what it equals to. And it's a great place to raise a family. That's probably as important as anything."

Another participant elaborated on the family values intertwined with farming:

> I grew up farming with my father and we farmed and had livestock, so to us it's a lifestyle. It's a way to raise your family and it's a connection to the land. It encompasses even our spiritual life. There's planting, there's harvest; there's times of death and times of renewal. Everything about our lives and how we've directed our kids, we have four children. It's been living on a farm and having those values, caring for things and following through and have big gardens. We've raised livestock, we probably do a lot of things we wouldn't have to do, but we like having them because we want our family to understand these things.

However, many also commented that they believed life to be simpler on the farm in previous generations than it is now.

Trust

Lastly, the idea of trust (or lack thereof) emerged as an influencing factor on the decision-making of participants. The idea of what made an information source 'credible' was an important part of trust.

Trust
Credible Sources of Information
• Lack of trust- some groups are biased
• Trust in information from university, extension, and local agencies (particularly SWCD)

Credible Sources of Information

Several information sources were discussed by participants with varying levels of trust. The University of Minnesota and its local extension offices were two sources noted by several participants to be trustworthy. One participant described why he trusts extension: "I would say by in large farmers trust Extension, Extension educators, probably because we seem them as not having a financial interest. They're not going to make money by selling us something. We see the extension as a neutral third party."

Other interviewees felt their local agencies (like SWCD or NRCS) had the most trustworthy information:

> I would have to say the local because they know what's going on. You get to state DNR, look at how diverse even Minnesota is. You get to the flat plains, you have hilly ground. As you go down to the southeast, you have all woods, swamp ground. And then you get some flatter. It varies so you got to keep it on a local basis, you just can't speak for any other [area]

Many participants discussed the need to look at an information source critically to determine if it has bias. For example, some noted any group trying to sell you a product (like a seed dealer) is somewhat biased in the information they provide. One interviewee described the groups he consults with, but needing to understand the potential bias associated with those groups:

> …Agronomists, retail dealers - I always take that in the context that they have an incentive to portray or relay information in a particular way based on what their capacity is. They're trying to sell a product. I also seek out or pay attention to the information which is always made available what I think are more unbiased sources: research institutes, University of Minnesota.

Conclusions

This project's aim was to provide a social science-based assessment of conservation behavior among landowners and farmers in the Lower Minnesota watershed. Specifically, this study investigated the drivers of, and constraints to, conservation action among watershed landowners and farmers. Findings from this study are intended to inform and enhance the conservation programming of local and state agencies and to facilitate future communication about conservation. The following conclusions are based on a synthesis of survey and interview findings.

1. Social influences drive conservation decision-making

According to the survey findings, the biggest influencers on landowners' conservation decision making are family, farmers, the county's Soil and Water Conservation District (SWCD), neighbors, and the Farm Service Agency. However, a comparison between two survey respondent subgroups, which varied in level of practice adoption, reveal significant differences between groups in the extent to which others influence their conservation decision making. High clean water action (HA) respondents (i.e., those who have adopted 7 or more of the 14 clean water actions listed) were influenced to a greater extent than low clean water action (LA) respondents (i.e., those who have adopted fewer than 7 of the 14 clean water actions listed) by their family, other landowners, their county's SWCD, and state agencies (e.g., Minnesota Department of Agriculture, Minnesota Department of Natural Resources). The most trusted sources of information for survey respondents on water quality issues were their county's SWCD, other farmers, and family. Interviewees revealed that they rely on various agricultural professionals (e.g., agronomist, farm manager), [define what kind of] suppliers, and SWCD. Interviewees also identified local agencies, University of Minnesota, and UMN Extension as trusted sources of information. Further, the interview findings reinforce that landowners learn about conservation practices from other landowners and trust information coming from them.

Landowners and farmers are clearly influenced in their conservation decision-making by multiple actors from their communities. Thus, those actors should be included in community discussions about water resources and conservation. Promoting information exchange among various stakeholders through formal and informal networks is likely to be effective in increasing landowner conservation behaviors. Because farmers are more trusting of information from other farmers, promoting farmer-to-farmer networks for sharing information about conservation practices may be a useful strategy.

2. Stewardship ethic and perceived benefits to land and community drive conservation practice adoption

Survey findings suggest that landowners are aware of, and concerned about, the consequences of water pollution on human health, soil health, and aquatic life. Most landowners also believe that it is their personal and collective responsibility to protect water resources, and feel a personal obligation to do so. Survey respondents' norms and civic actions varied by level of practice adoption (i.e., High clean water action (HA) vs low clean water action (LA) respondents). Personal norms or feelings of personal obligation appear to be a significant motivator for conservation action. HA respondents reported feeling a stronger sense of personal obligation to protect water resources, and engage in civic actions around water. Interview findings also reveal a strong stewardship ethic among farmers driving their conservation behavior. Many farmers expressed that being a good steward to the land, and not being wasteful in terms of resource use, was important to them.

Survey and interview findings suggest that landowners perceive multiple environmental and community benefits of conservation practices. Comparisons between HA and LA respondents suggest that beliefs about the benefits of conservation practices is a significant motivator of practice adoption. Similarly, farmers who were interviewed identified several water quality (e.g., downstream benefits), soil health (e.g., soil fertility), and wildlife (e.g., wildlife habitat) benefits of conservation practices.

3. **Financial incentives and conservation program reformation are important drivers of conservation practice adoption**

Providing financial assistance and reducing the complexity of conservation programs, appear to be major factors that would increase the likelihood of conservation practice adoption among survey respondents. Both HA and LA respondents indicate that higher payments for practice adoption, compensation for lost crop production, and access to financial resources are significant drivers of conservation practice adoption. Findings from interviews suggest that despite the perceived benefits of conservation practices and farmers' stewardship ethic, farmers are less likely to adopt practices if doing so would adversely impact farm profitability. Farmers reported that the practices would have to be economically viable for them to use on their land. The adoption and maintenance costs (e.g., input, equipment costs) of conservation practices were of concern for farmers. Financial incentives appear to be a motivator for farmers interviewed. However, not all participants were willing to work with a cost-share program because of program complexity. Efforts to streamline enrollment and increase program flexibility may be useful strategies to increase participation.

4. **Perceptions of multiple factors can constrain conservation action including lack of equipment, personal financial resources, community financial resources, and/or community leadership.**

Perceptions of knowledge and skills varied by landowners' level of practice adoption and their level of engagement in water resource protection (i.e., high civic engagement (HCE) vs. low civic engagement (LCE)). Landowners who are more engaged in conservation through private-sphere actions (e.g., practice adoption) or civic actions (e.g., engagement in water protection) are more likely to believe that they have the knowledge and skills needed to protect water resources. Lack of equipment, personal financial resources, community financial resources, and community leadership also emerged as constraints to conservation action. Comparisons of respondents by levels of civic engagement shows that landowners who are more engaged in civic actions to protect water are more likely to believe that they have the financial resources to protect water. Study findings also indicate that most landowners believe that they do not have control over policies that affect their land. This is particularly true for landowners who are not highly engaged in civic actions to protect water. Landowners who are not highly engaged in community activities, including civic actions to protect water, are more likely to believe that they have little influence over water protection in their area.

5. **Lack of personal and social norms for civic action is a major constraint to community engagement in water resource protection**

This study reveals a significant gap between private-sphere (e.g., practice adoption) and public sphere (e.g., civic engagement in water) norms and behaviors. While most landowners reported feeling a sense of personal obligation to do whatever they can to prevent water pollution, including using conservation practices, considerably fewer landowners feel obligated to engage in civic actions (e.g., talk to others about conservation practices, attend meetings or public hearings about water). Further, landowners who are not highly engaged in water protection (i.e., HCE respondents)are less likely to feel a sense of obligation to be civically engaged in water protection. Over two-thirds of participants had never attended a meeting or public hearing about water, or participated in a water resource protection initiative. This is in contrast to a majority of landowners who

reported that they currently use practices and intend to use practices such as buffer strips and conservation tillage in the future.

Lack of social norms of civic action emerged as a constraint to landowners' engagement in water resource protection. Survey findings suggest that social norms related to expectations of civic action are generally low. Most landowners did not feel any social pressure to engage in water resource protection. Comparisons between landowners by levels of civic engagement revealed that landowners who are more engaged are more likely to feel greater social pressure to engage in civic actions.

Recommendations

We recommend a multi-strategy approach to conservation programming that emphasizes the benefits of conservation practices, encourages personal commitment to conservation, addresses resource constraints, and supports community-building, and social norm development for civic engagement, around water.

1. Emphasize benefits of conservation practices and encourage personal commitment to conservation

This study shows that landowners and farmers in the Lower Minnesota watershed perceive the benefits of conservation practices. Study participants identified water quality, soil health, wildlife, and community benefits of conservation practices. Communication campaigns that aim to engage landowners and farmers in conservation should emphasize these benefits of conservation programs. Study findings also suggest that landowners and farmers are concerned about the impacts of water pollution on their health, future generations, and aquatic life. Thus, communication campaigns should also highlight the connections between water pollution and its impacts on community and environmental health, and the effectiveness of conservation practices in alleviating or reducing those impacts. We recommend tailored informational strategies that provide information about practices that are relevant to targeted stakeholders. Communication campaigns should draw connections between local water conditions (e.g., impairment in stream reach A), their potential consequences (e.g., impacts to aquatic life), and effectiveness of practices (e.g., water quality benefits of buffers, soil erosion prevention benefits of cover crops).

Another major finding from this study is that sense of responsibility for water protection, personal norms, or feelings of personal obligation to protect water resources, and social pressures or norms drive conservation action. Strategies that promote conservation as an individual and social norm, and appeal to landowners' sense of personal obligation are likely to be effective in increasing conservation practice adoption. Norm-based intervention strategies such as encouraging personal commitments has been shown to influence conservation behavior (e.g., Abrahamse, Steg, Vlek, & Rothengatter, 2005; De Snoo et al., 2010). Commitments in the form of a verbal or written pledge can establish personal norms, if made to oneself, and social norms, if made public. Further, commitments with a specific plan of action (e.g., I pledge to plant cover crop in the next growing season) can be particularly successful. This strategy can be especially effective if paired with goal setting, and tailored feedback about conservation (e.g., Abrahamse, Steg, Vlek, & Rothengatter, 2005; De Snoo et al., 2010; Steg and Vlek, 2009). Benchmarking or providing feedback about behaviors compared to others leads to normative pressure to keep up with others, and may result in behavior change (De Snoo et al., 2010). For example, setting specific goals on adoption of practices (e.g., 25% of farmland in cover crops) along with frequent feedback to landowners about farm and local environmental conditions, and the extent to which the goals are being met, can reinforce conservation norms. In similar studies on energy conservation and farmer conservation behavior, a combination of strategies that ask participants to set specific conservation goals, commit to conservation efforts, and provide feedback on practices, has been effective at promoting behavior change (e.g., Abrahamse et al., 2007; De Snoo et al., 2010).

2. Address resource constraints through technical assistance and incentive programs

The biggest constraints at the individual and community levels appear to be lack of financial resources, equipment, and community leadership. Lack of knowledge and skills to use conservation practices also constrains practice adoption, particularly for landowners who are not already engaged in conservation actions. Availability of financial incentives is a primary driver of practice adoption. Payments for conservation

practices and availability of cost-share opportunities are motivators for many landowners and farmers. Technical assistance programs, particularly those that are targeted at landowners who are not highly engaged in conservation can enhance landowner knowledge and skills needed to adopt conservation practices. While many landowners and farmers are driven by their stewardship ethic, the costs associated with adopting and maintaining conservation practices is a significant burden for them. Programs that provide payments for conservation and cost share resources can help offset some of the capital and maintenance costs, thus reducing the risks associated with adopting a new practice. Programs that provide equipment through rental agreements or trial periods also look promising.

Study findings also suggest that while conservation programs can be an important source of financial support, the complexities involved in program participation constrain many landowners and farmers from taking part. Thus, reducing program complexity by streamlining and simplifying the process of enrollment, and increasing flexibility in implementation can lead to greater program participation. Most landowners also perceive that their community lacks the financial resources and leadership to address water issues. There seemed to be some skepticism about the capacity (e.g., staffing and training levels) of local government units to protect water resources. Leadership development trainings and capacity-building at the local level may be necessary, and may help to bolster confidence and engagement among landowners.

3. **Support community-building, and consequent norm development, centering on water engagement**

This study highlights a significant gap between private-sphere (e.g., practice adoption) and public-sphere (e.g., civic engagement) norms and actions. While most landowners feel a sense of personal obligation to use conservation practices, and intend to continue to use practices in the future, considerably fewer landowners are currently engaged in civic actions, or intend to engage in civic actions in the future. Further, there appears to be a lack of social pressure to engage with others around conservation and water resource issues. Landowners who are not engaged in their community, may not know what others are doing in regards to water resource protection. The lack of community engagement can stymie diffusion of innovation (Rogers, 1995), which could be a significant constraint in terms of practice adoption.

Landowner engagement in water protection can be influenced by the "citizen effect" or social norms that favor conservation action (Morton and Brown, 2011). Strategies that build social support and model conservation behavior through demonstration projects, community events, and recognition programs can help build social norms around conservation. Demonstration projects can be used to model the effectiveness of conservation practices. Further, sharing information about successes in conservation can reduce perceptions of risk and uncertainty by demonstrating that others in the community have successfully implemented practices. Community events that include recognition of those who have civically engaged to protect water, and the impacts of their engagement, can be a useful strategy to help establish community engagement as a social norm. Landowner recognition programs that show appreciation for engagement in conservation action also helps reinforce conservation as a community norm, and may provide additional incentive for participation.

Finally, both survey and interview findings highlight the importance and role of multiple community actors in influencing landowners' conservation decision-making. Creating opportunities to instill water protection themes into community gatherings involving diverse participants can serve to normalize the topic and promote information exchange between landowners and other community stakeholders.

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Appendices

Appendix A: Survey Questionnaire

ID# _____

Your Perspectives on Local Water Resources

A survey of landowners in Lower Minnesota Watershed

Center for Changing Landscapes

UNIVERSITY OF MINNESOTA

Driven to Discover℠

Before you begin:

We are conducting this survey **to better understand landowner opinions and practices** and to improve conservation programming. **This survey is voluntary and confidential.** It should take **about 20 minutes to complete** this questionnaire. Please answer the questions as completely as possible.

As you complete the survey, please keep in mind the following definitions:

Buffer/filter strip: A strip of vegetation (grasses, trees, and shrubs) planted and maintained adjacent to streams, ditches and lakes that filters water, stabilizes the stream bank, and provides wildlife habitat.

Conservation drainage management: Technologies and practices that remove excess water from lands while reducing potential pollutants (includes controlled drainage, shallow drainage, bioreactors, saturated buffers, rock inlets, storage basins, and ditch designs).

Conservation cover: Converting environmentally sensitive areas to vegetative cover to reduce soil erosion, improve water quality, and enhance forest and wetland resources (includes Conservation Reserve Program and land retirement).

Conservation tillage: Soil cultivation that leaves the previous year's crop residue on fields before and after planting the next crop to reduce soil erosion and surface runoff (includes no, minimum, strip, ridge, mulch-till).

Once you've completed the survey:

Please fold it in thirds and mail it back in the enclosed self-addressed stamped envelope.

Thank you for your help!

I. Your Community

First, we would like to know your thoughts on your community.

1. Approximately how many years have you lived in your current community? _____

2. When you think of <u>your community</u>, what first comes to mind? *(Please check one)*

[ ] My neighborhood [ ] My township [ ] My city [ ] My county [ ] My watershed

3. How important are the following qualities of <u>a community</u> to you? *(Circle one number in each row.)*

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
a. Strong family ties	-2	-1	0	1	2
b. Good relationships among neighbors	-2	-1	0	1	2
c. Opportunities to be involved in community projects	-2	-1	0	1	2
d. Opportunities to express my culture and traditions	-2	-1	0	1	2
e. Clean streams, rivers and lakes	-2	-1	0	1	2
f. Access to natural areas/views	-2	-1	0	1	2
g. Opportunities for outdoor recreation	-2	-1	0	1	2

4. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. If there is someone I want to meet in my community, I can usually arrange it.	-2	-1	0	1	2
b. When I need assistance with something on my farm/land, I often <u>find it difficult</u> to get others to help.	-2	-1	0	1	2
c. I find it easy to play an important role in most group situations within my community.	-2	-1	0	1	2
d. The average farmer/landowner can have an influence on rural community life in the region.	-2	-1	0	1	2

II. Water (Streams, Lakes, Wetlands and Groundwater)

In the next section, we ask more specific questions related to your perspectives on water.

5. How familiar are you with water issues in your watershed? [*see enclosed watershed map*]

[ ] Not at all familiar [ ] Slightly familiar [ ] Moderately familiar [ ] Very familiar

6. <u>Before this survey</u>, did you know your property is in the watershed shown on the map?

[ ] Yes [ ] No [ ] My property is not in the shaded watershed

7. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Water resources in the Lower Minnesota watershed are adequately protected.	-2	-1	0	1	2
b. Water resources in Minnesota need better protection.	-2	-1	0	1	2
c. Water resource protection will threaten jobs for people like me.	-2	-1	0	1	2
d. Laws to protect the environment limit my choices and personal freedom.	-2	-1	0	1	2
e. Water pollution affects human health.	-2	-1	0	1	2
f. Excessive water runoff causes soil and nutrient loss.	-2	-1	0	1	2
g. Conservation practices protect aquatic life.	-2	-1	0	1	2
h. Conservation practices contribute to quality of life in my community.	-2	-1	0	1	2
i. Conservation drainage management reduces water runoff from farmland.	-2	-1	0	1	2
j. Drainage tiling increases crop yield.	-2	-1	0	1	2
k. Drainage tiling contributes to higher water flows downstream.	-2	-1	0	1	2
l. Conservation tillage decreases crop yield.	-2	-1	0	1	2

8. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. It is my personal responsibility to help protect water.	-2	-1	0	1	2
b. It is my personal responsibility to make sure that what I do on the land doesn't contribute to water resource problems.	-2	-1	0	1	2
c. Landowners upstream should be responsible for protecting water downstream.	-2	-1	0	1	2
d. The state government should be responsible for protecting water.	-2	-1	0	1	2
e. Local government should be responsible for protecting water.	-2	-1	0	1	2
f. Urban residents in my watershed should be responsible for protecting water.	-2	-1	0	1	2
g. Farmers in my watershed should be responsible for protecting water.	-2	-1	0	1	2

9. In your opinion, how much of a problem are the following water pollutants/issues in your watershed *[see map]*? *(Please circle one number for each row)*

	Not a problem	Slight problem	Moderate problem	Severe problem	Don't know
a. Sediment (cloudiness)	1	2	3	4	DK
b. Phosphorus	1	2	3	4	DK
c. Nitrogen in surface water	1	2	3	4	DK
d. Nitrogen in drinking water	1	2	3	4	DK
e. Algae	1	2	3	4	DK
f. Flooding	1	2	3	4	DK
g. Drought	1	2	3	4	DK
h. *E. coli* (bacteria)	1	2	3	4	DK
i. Pesticides	1	2	3	4	DK

10. In your opinion, how much of a problem are the following potential sources of water pollutants/issues in your watershed *[see map]*? *(Please circle one number for each row)*

	Not a problem	Slight problem	Moderate problem	Severe problem	Don't know
a. Industrial discharge to streams, rivers, and lakes	1	2	3	4	DK
b. Urban land development	1	2	3	4	DK
c. Improperly sized/maintained septic systems	1	2	3	4	DK
d. Soil erosion from farmland	1	2	3	4	DK
e. Wind erosion	1	2	3	4	DK
f. Stream bank erosion	1	2	3	4	DK
g. Fertilizer management for lawn/turf care	1	2	3	4	DK
h. Fertilizer management for crop production	1	2	3	4	DK
i. Livestock operations	1	2	3	4	DK
j. Tile drainage	1	2	3	4	DK
k. Surface ditch drainage	1	2	3	4	DK
l. Grass clippings and leaves entering storm drains	1	2	3	4	DK
m. Urban/suburban water runoff	1	2	3	4	DK
n. Unregulated contaminants (e.g., pharmaceuticals, personal care products)	1	2	3	4	DK
o. Natural causes (e.g., natural erosion, wildlife)	1	2	3	4	DK
p. Increased frequency or intensity of storms	1	2	3	4	DK

11. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

I am concerned about the consequences of water pollution for...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My or my family's health	-2	-1	0	1	2
b. Future generations	-2	-1	0	1	2
c. Wildlife	-2	-1	0	1	2
d. Farmland	-2	-1	0	1	2
e. Aquatic life	-2	-1	0	1	2
f. People in my community	-2	-1	0	1	2

12. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My use of a conservation practice contributes to healthy water resources.	-2	-1	0	1	2
b. By taking an active part in conservation, people can keep water clean in Minnesota	-2	-1	0	1	2
c. I have the knowledge and skills I need to use conservation practices on the land.	-2	-1	0	1	2
d. I can learn almost anything about natural resource stewardship if I set my mind to it.	-2	-1	0	1	2
e. I have the financial resources I need to use conservation practices on the land.	-2	-1	0	1	2
f. I have the equipment I need to adopt a new conservation practice.	-2	-1	0	1	2
g. I do not have the time to use conservation practices	-2	-1	0	1	2
h. Farmers in my community have the ability to work together to change land use practices.	-2	-1	0	1	2
i. My community has the financial resources it needs to protect water resources.	-2	-1	0	1	2
j. My community has the leadership it needs to protect water resources.	-2	-1	0	1	2
k. Weather has a big impact on my decisions about conservation practices on the land.	-2	-1	0	1	2

13. How much influence do you think people like you have over the following? *(Please circle one number for each row)*

	Not at all	Little	Some	A lot
a. Protecting clean water in the area	0	1	2	3
b. Preserving farms and farmland in the area	0	1	2	3
c. Inspiring or organizing others to take action in the community	0	1	2	3

14. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. There is nothing that we can do to keep the costs of farm/land management from going up.	-2	-1	0	1	2
b. I can usually achieve what I want on my farm/land when I work hard for it.	-2	-1	0	1	2
c. Most of what happens on my farm/land is beyond my control.	-2	-1	0	1	2
d. It is difficult for us to have much control over policies that affect our farms/lands.	-2	-1	0	1	2
e. I can usually rely on weather forecasts to manage my farm/land.	-2	-1	0	1	2
f. The weather is so variable that it is difficult to make decisions on my farm/land.	-2	-1	0	1	2
g. By adapting farm/land management practices, people can become more resilient to changes in weather patterns.	-2	-1	0	1	2

15. To what extent do you agree or disagree with the following statements? *(Please circle one number for each row)*

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. People who are important to me expect me to talk to others about conservation practices.	-2	-1	0	1	2
b. People who are important to me talk to others about conservation practices.	-2	-1	0	1	2
c. People who are important to me expect me to attend meetings or public hearings about water.	-2	-1	0	1	2
d. People who are important to me attend meetings or public hearings about water.	-2	-1	0	1	2
e. People who are important to me expect me to work with other community members to protect water.	-2	-1	0	1	2
f. People who are important to me work with other community members to protect water.	-2	-1	0	1	2

III. Conservation Practices and Community Engagement

Now, we have a few questions about your conservation practices and community engagement. Remember, your responses to all of the survey questions are confidential.

16. Do you use the following practices on your land/property? Do you intend to use these practices on your land/property in the future? *(Please check yes/no for each)*

	Do you use the practice on your land/property now?		**Do you intend to use the practice on your land/property in the future?**		Not Applicable
	Yes	No	Yes	No	
a. Buffer/filter strip along streams and ditches or field edges	☐	☐	☐	☐	☐
b. Conservation drainage management practices (e.g., controlled drainage, storage basins)	☐	☐	☐	☐	☐
c. Conservation tillage practices (e.g., no till, minimum till)	☐	☐	☐	☐	☐
d. Land in conservation cover (e.g., Conservation Reserve Program)	☐	☐	☐	☐	☐
e. Drainage tiles	☐	☐	☐	☐	☐
f. Terraces	☐	☐	☐	☐	☐
g. Vertical drop side inlets (adjacent to ditches)	☐	☐	☐	☐	☐
h. Water and sediment control basins	☐	☐	☐	☐	☐
i. Agriculture waste management facility or system	☐	☐	☐	☐	☐
j. Rotation grazing	☐	☐	☐	☐	☐
k. Cover crops	☐	☐	☐	☐	☐
l. Drainage water management planning	☐	☐	☐	☐	☐
m. Protect wetlands on the land/property	☐	☐	☐	☐	☐
n. Plant trees as a windbreak on the land/property	☐	☐	☐	☐	☐
o. Follow a nutrient management plan on the farm	☐	☐	☐	☐	☐
p. Rain barrel or cistern to store water	☐	☐	☐	☐	☐
q. Rain garden	☐	☐	☐	☐	☐
r. Native plants or shrubs in my yard	☐	☐	☐	☐	☐
s. Minimizing use of fertilizers/pesticides on lawns and gardens	☐	☐	☐	☐	☐

IV. Information about You and Your Land/Farm

Finally, we want to know a little bit about you in order to better understand who responded to this survey. Remember, your responses to all of the survey questions are confidential.

23. How do you use water resources in your watershed? (*Check all that apply*)

[ ] Drinking water
[ ] Canoeing/kayaking/other boating
[ ] Fishing
[ ] Swimming
[ ] Hunting
[ ] Watering livestock
[ ] Irrigation
[ ] Picnicking and family gatherings
[ ] Observing wildlife
[ ] Experiencing scenic beauty
[ ] Storing excess water from drainage system

24. How would you characterize the quality of water in the ditch, stream, lake, or river closest to you? *(Please check one box)*

[ ] Very poor [ ] Poor [ ] Fair [ ] Good [ ] Very good [ ] Don't know

25. How would you characterize the quality of water in the Minnesota River? *(Please check one box)*

[ ] Very poor [ ] Poor [ ] Fair [ ] Good [ ] Very good [ ] Don't know

26. Does the land you own or rent touch a ditch, stream, lake, or river? *(Please check yes or no)*

[ ] Yes [ ] No

27. Do you use your land/property for agricultural production? *(Please check yes or no)*

[ ] Yes *(If yes, answer question 27a)* [ ] No *(If no, skip to question 28)*

Q27a. How many acres are in agricultural production? _____acres

28. What is your experience with programs that offer financial incentives to farmers for conservation practices? *(Please check one box)*

[ ] Not relevant for my property [ ] Never heard of any [ ] Familiar but not enrolled [ ] Currently enrolled

29. Please describe the ownership arrangement and size of your property. *(Please check all that apply and include acreage)*

Ownership	Approximate Acreage
[ ] I own and manage my own land.	_____
[ ] I rent land to another party.	_____
[ ] I rent land from another party.	_____
[ ] Other (please specify): _____	_____

30. Who makes the management decisions on the land? *(Please check one box)*

[ ] I make my own decisions.
[ ] I leave it up to my renter.
[ ] I leave it up to the landowner/property owner.
[ ] I work together with the renter/landowners to make decisions.

31. In what year were you born? _____ [ ] Prefer not to respond

32. Are you... [ ] Male [ ] Female [ ] Prefer not to respond

33. What is the highest level of formal education you have completed? (Please check one box)

[ ] Did not finish high school
[ ] Completed high school
[ ] Some college but no degree
[ ] Associate degree or vocational degree
[ ] College bachelor's degree
[ ] Some college graduate work
[ ] Completed graduate degree (Masters or PhD)
[ ] Prefer not to respond

34. What category best describes you? (Please check all that apply)

[ ] **White**
For example, German, Irish, English, Italian, Polish, French, Swedish, Norwegian, etc.

[ ] **Hispanic, Latino, or Spanish heritage**
For example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadoran, Dominican, Colombian, etc.

[ ] **Black or African American**
For example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somalian, etc.

[ ] **Asian**
For example, Chinese, Filipino, Asian Indian, Vietnamese, Hmong, Korean, Japanese, etc.

[ ] **American Indian or Alaska Native**
For example, Minnesota Chippewa Tribe, Shakopee Mdewakanton Sioux, Navajo Nation, Mayan, Aztec, Nome Eskimo Community, etc.

[ ] **Middle Eastern or North African**
For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian etc.

[ ] **Native Hawaiian or Other Pacific Islander**
For example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese, etc.

[ ] **Some other race, ethnicity or heritage (Please specify):** _____

[ ] **Prefer not to respond**

35. Which of the following best describes your total household income from all sources in 2015 before taxes? *(Please check one box)*

[ ] Under $20,000
[ ] $20,000 - $49,999
[ ] $50,000 - $74,999
[ ] $75,000 - $99,999
[ ] $100,000 - $149,999
[ ] $150,000 - $199,999
[ ] $200,000 - $249,999
[ ] $250,000 - $299,999
[ ] $300,000 or more
[ ] Prefer not to respond

36. Approximately what percentage of your income is dependent on agricultural production? ____%

37. Do you have any other comments about your community or water management?

Thank you for your help!

Please complete the survey, fold it in thirds, and mail it back in the enclosed self-addressed stamped envelope.

If you have questions please contact Dr. Amit Pradhananga, Department of Forest Resources, 115 Green Hall, 1530 Cleveland Avenue N., St. Paul, MN 55108. Phone: (612) 624-6726 or by email at prad0047@umn.edu.

Appendix B: Survey Cover Letter

[Date]

[First Name] [Last Name]
[Street Address]
[City] [State] [Zip code]

Lower Minnesota Landowner Survey
Information and Consent Form

Dear [First Name] [Last Name],

I am writing to ask for your help in a study about landowners and water resources. The study is being conducted by the Center for Changing Landscapes, University of Minnesota in partnership with the Minnesota Pollution Control Agency. I am contacting you because you are a landowner in the Lower Minnesota watershed and we want to know what you think about water.

The findings from this study will be used to help local resource managers and community leaders better understand landowners' views and to facilitate communication and outreach programs in the area. We really appreciate you taking the time to help us with this study. It should take you only about 20 minutes to complete the questionnaire.

For your reference, a map of the Lower Minnesota watershed is enclosed.

This survey is voluntary and completely confidential. The risks of participating in this study are minimal. There are no direct benefits to you for participating in this study. You are free to withdraw at any time. Completion of this survey indicates your voluntary consent to participate. Your decision to participate will not affect your current or future relationship with the University of Minnesota. The ID # on the front page of your survey is used to help us track mailings, ensuring that your name is never affiliated with your responses. Please answer the questions as completely as possible. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed, postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at 612-624-6726, or by email at prad0047@umn.edu. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D-528 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota, 55455; telephone (612) 625-1650.

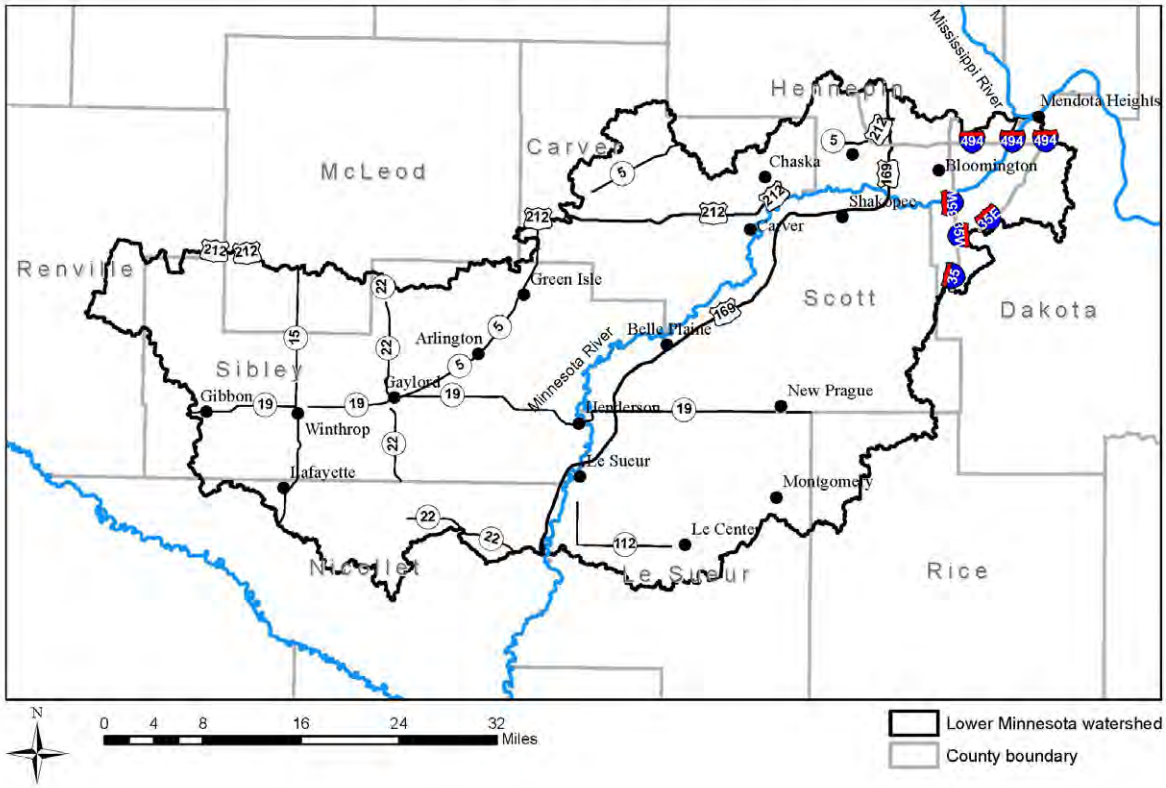
I hope you enjoy completing the questionnaire and I look forward to receiving your response.

Sincerely,

Amit Pradhananga
Center for Changing Landscapes
University of Minnesota

Appendix C: Lower Minnesota Watershed Map

Lower Minnesota Watershed



Appendix D: Survey Reminder Letter

[Date]

[First Name] [Last Name]
[Street Address]
[City] [State] [Zip code]

Lower Minnesota Landowner Survey
Information and Consent Form

Dear [First Name] [Last Name],

About a month ago, I sent you a questionnaire that asked about your perspectives on your community and its water resources. If you have already returned your questionnaire, thank you for your response. We sincerely appreciate your input!

If you have not yet responded, I am writing again because of the importance of your participation to the study and its intended outcomes. It should take you only about 20 minutes to complete the questionnaire. The responses we have already received from other landowners in your watershed show a range of beliefs about water resources and support for watershed management initiatives. We want to ensure that your opinions are represented, too!

The purpose of this survey is to learn more about how landowners in the Lower Minnesota watershed perceive and interact with their community, their environment, and specifically water resources. Your input will inform water and land management decisions in the area. The study is being conducted by the Center for Changing Landscapes, University of Minnesota in partnership with the Minnesota Pollution Control Agency.

For your reference, a map of the Lower Minnesota watershed is enclosed.

This survey is voluntary and completely confidential. The ID # on the front page of your survey is used to help us track mailings, ensuring that your name is never affiliated with your responses. Please answer the questions as completely as possible. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed, postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at 612-624-6726, or by email at prad0047@umn.edu. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D-528 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota, 55455; telephone (612) 625-1650.

I hope you enjoy completing the questionnaire and I look forward to receiving your response.

Sincerely,

Amit Pradhananga
Center for Changing Landscapes
University of Minnesota

Appendix E: Interview Contact Script

Lower Minnesota Watershed Study

Script for Initial Contact

"Hello, my name is _____. I am a graduate student/researcher with the Center for Changing Landscapes at the University of Minnesota. I am working on a study that involves farmers in the Lower Minnesota Watershed. This project will help us better understand perspectives around conservation practices and clean water. Study findings will inform conservation program development, outreach and planning. I have been [will be] interviewing farmers to gather their insights about their farms and the decisions they make regarding conservation practices and was hoping you would be able to assist me by participating in the study and sharing your perspectives with me. We are offering a $20 reimbursement for your participation. The interview takes about one and a half hours. Would you be willing to participate?"

If yes: "Thank you. I am available on _____ (days of week, times, have alternates ready) is there a time that would work best for you? [Set date, time, location (get directions)]. I would like to send you a confirmation email with date, time and location information. The email will include all of my contact information, in case you have any questions or concerns. Do you have an email address I can send the confirmation to?

a. **If yes**, take it down or confirm we have the correct email address for them. "Thank you. I look forward to meeting with you on ___(agreed upon date)___."

b. **If no**, "Is __(phone # you contact them with)___ the best way for me to get a hold of you? In case you need to get a hold of me with questions or concerns, my phone number is _____." I look forward to meeting with you on ___(agreed upon date)___.

If no: "Ok, thank you for your time. Good bye."

If they seem unsure: "Just to be clear, participation is completely voluntary and if you decide to participate you can withdraw at any time. Your identity will remain confidential and we won't include any information that would make it possible to identify you in any published reports. We're only talking to a limited number of key representatives, so capturing your perspective is important. Can I ask what your concerns about participating are?" [Try to address their concerns]

If they want to know why they are being asked to participate: "We're interviewing a variety of farmers to try to get diverse perspectives and a range of experiences. I've talked to others in your community and your name came up as someone who is familiar with these issues. Since we are only able to conduct a limited number of interviews, capturing your perspective is important."

If they want to know how the information will be used: "We are trying to better understand farmers' perspectives on their farms, challenges they face, and decisions associated with conservation practices. We'll be putting together a final report that identifies those drivers and constraints to share with community leaders, educators and resource professionals. Your information will be kept confidential and there will not be any identifying information in the report."

If they want to know what the study is for: "This project is aimed at informing outreach and education programs to promote voluntary adoption of conservation practices in the Lower Minnesota Watershed. Landowner input is critical to making these programs work for both water resource protection and for landowners."

If they want to know who is supervising the research: "Mae Davenport is the supervisor for this study. She is a Professor in the Department of Forest Resources at the U of M. If you would like to contact her directly I can give you her phone number [612-624-2721] or email address [mdaven@umn.edu]."

If they ask about IRB: The research project has been reviewed by the IRB/Human Subjects Committee.

Appendix F: Interview Guide

ID #_____

Lower Minnesota Watershed Interview Guide
University of Minnesota
January 16, 2018

First, I'd like to start with a few questions about your farm and farming in general.

1. **Tell me about your farm and what it means to you.**
    a. What do you like about being a farmer/landowner?

2. **What worries or concerns you the most about farming today?**

3. If you could change anything about farming today, what would you change?

Next, I would like to learn more about your decision making process on your farm.

4. **Who makes the decisions about your farm and land?**

5. **Do you consult with others when making decisions? Or do others influence your decisions?**
    a. If so, who do you talk to?

6. **What are the most important considerations when making decisions about your farm?**

7. How do you evaluate the success of your farm operation?
    a. What kinds of outcomes are you looking for in judging success?
    b. What issues challenge or limit you in making your farm operation a greater success?

8. **Have you changed the way you farm in the past 5 years in attempt to make your farm more successful?**
    a. If so, please describe what changes you have made.

As you may know, there is increasing concern about water resources in the Lower Minnesota watershed. In turn, resource professionals are promoting conservation practices throughout the watershed to address these problems. Farmers, in particular, have been encouraged to consider conservation practices to reduce the impacts farming has on water resources. I have a few questions for you about water resources in this area.

9. **What do water resources in the area mean to you?**

10. **Are you concerned about water resources in the watershed? Please explain.**
    a. [If yes] What concerns you the most?

11. **Who do you think should be responsible for solving water resource problems in the watershed?**
    a. What role should farmers/landowners play in water resource protection?

The next set of questions inquires about your experiences with and opinions about conservation practices.

12. First, a broad question: What does the term "conservation" mean to you?
    a. What do you see as your role in conservation?

13. **Do you use practices on your farm/land that reduce the impacts your farm has on water resources? Please describe those practices for me. [Write down practices, then for each practice ask the following]**
    a. How long have you used this practice on your farm?
    b. Where did you hear about this practice?
    c. What first motivated you to use this practice?
    d. What do you like about this practice?
    e. What don't you like about this practice?
    f. Is this practice doing what it was intended to do? Please explain.
    g. Do you plan to maintain this practice on your land over the next five years? Please explain.

14. **Are there any other conservation practices you have been considering?** [If yes, ask questions a-c for each, if no skip to 15]
    a. What have you heard about this practice?
    b. What factors have kept you from adopting this practice?
    c. Would you adopt this practice if things were different? Please explain.
    d. [If not already discussed] Have you considered using cover crops? Please explain.

15. Do you budget for implementing conservation practices each year?
    a. [If yes] Approximately what proportion of your budget would you say is devoted to conservation practices?

16. **Have you worked with your local SWCD or NRCS when considering or implementing conservation practices?**
    a. [If yes] Why did you choose to work with the county (SCWD or NRCS)?
    b. How would you describe working with the county (SWCD or NRCS)?

17. **Overall, what are the most important considerations for you when making decisions about conservation practices on your farm?**

18. **Would you be more likely to adopt or maintain conservation practices if...**
    a. You knew they had benefits downstream?
        i. Which benefits would be most important to you? (e.g. reduced flooding, increased water quality, enhanced wildlife habitat)
    b. You had financial assistance to implement the practices?
    c. You had evidence that the practices would not reduce yield?
    d. Most farmers/landowners you knew had adopted the practices?
    e. You could talk to other farmers how to make the practices work on your farm?

19. **Do you talk to others about conservation practices? Who do you talk to?**

20. **Who do you consider to be the most trusted source of information about conservation practices?**

Finally, I have a few general questions for you about water resource conservation in the Lower Minnesota watershed.

21. **What do you think are the 3 biggest obstacles in the way of healthy water resources in the area?**

22. **What do you think are the 3 keys to success to achieve healthy water resources in the area?**

23. Is there anything you would like to add about your farm, conservation practices or water resources in general that we haven't covered?

Appendix G: Interview Consent Form

Lower Minnesota Watershed Landowner Conservation Study
Consent Form

You are invited to participate in a study of agricultural conservation action in the Lower Minnesota Watershed from the perspectives of local farmers/landowners. You were selected as a possible participant for an interview because you are a farmer/landowner in the watershed. We ask that you read this form and ask any questions you may have before agreeing to be in the study. This study is being conducted by: Amit Pradhananga, Research Associate and Mae Davenport, Professor in the Department of Forest Resources, University of Minnesota.

Background Information
The purpose of this study is to better understand what influences landowners' decisions about conservation practices and their engagement in water resource issues.

Procedures:
If you agree to be in this study, we would ask you to participate in an interview lasting approximately 90 minutes. The interview will be audio-recorded and transcribed.

Risks and Benefits of being in the Study
Risks associated with this study are minimal; responses are confidential and participants' names will not be linked to any information in any publications. Benefits of participation may include increased awareness of agricultural conservation practices. Study results will be made available to the public and all participants will have access to them.

Compensation:
$20 reimbursement will be offered for participation in an interview.

Confidentiality:
The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records. Your responses to the interview questions will be audio-recorded, transcribed and kept for three years in a locked office. Afterward, these recordings will be destroyed. A participant database with your name and address will be stored in a password protected computer. Only those directly involved with the project will have access to the project files including audio recordings and the interview notes.

Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:
The researcher conducting this study is: Amit Pradhananga. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at address: 37 McNeal Hall, 1985 Buford Avenue,, St. Paul, MN 55108, phone: 612-624-6726, email:

prad0047@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

"I agree_____ I disagree_____ to have my responses audio-recorded"

"I agree_____ I disagree_____ that Mae Davenport may quote me anonymously in her papers"

Signature:_____Date:_____

Signature of Investigator:_____Date:_____

Appendix H: Interview Conservation Checklist

ID#: _____

Agricultural Conservation Practices Checklist

Conservation Practices:	Definition/Benefit:	Do you use? Yes (Y) or No (N)
Buffer/filter strips	Vegetation (grasses, trees, and shrubs) planted and maintained adjacent to streams, ditches and lakes that filters water, stabilizes the stream bank, and provides habitat for wildlife.	
Conservation tillage (no-till, strip-till, ridge-till, mulch-till)	Soil cultivation that leaves the previous year's crop residue on fields before and after planting the next crop to reduce soil erosion and runoff.	
Cover Crops	Crops planted primarily to prevent soil erosion & runoff, improve soil health, and provide wildlife habitat by providing seasonal cover on cropland.	
Grade (gully) stabilization	An embankment or spillway built across a drainageway to prevent soil erosion by controlling the way water falls to lower elevations.	
Grass waterways	Downhill grassed channels, generally broad and shallow, designed to prevent soil erosion while draining runoff water from adjacent cropland.	
Side water inlets	Structure on the bank of a stream or ditch that temporarily stores water, settles sediment and nutrients, and reduces erosion from overland flow, including drop inlets.	
Tile inlet alternative	An alternative to traditional tile inlet which instead slows water flow and allows sediment to settle out before entering into a subsurface drainage system, including french drains or rock inlets, and slotted risers.	
Water and sediment control basins	A series of small earthen ridge-and-channels or embankments built across a watercourse within a field to trap agricultural runoff water and sediment.	

Agricultural Conservation Practices: Practices on agricultural lands that prevent and/or minimize degradation of ground and surface water.

Appendix I: Interview Background Information Form

Lower MN - Interview Background Information Form

1. How many years have you lived in your community? _____

2. Approximately, how many acres is your own land/property? _____

3. Do you farm your land or other rented property?

[ ] Yes [ ] No

4. Approximately, how many acres in total do you farm? _____

5. Which of the following best describes the ownership arrangement of the land you farm?

[ ] I own and farm my own land

[ ] I own and farm part of my own land and rent land to another party

[ ] I own and farm my own land and rent more land from another party

[ ] I rent my land to another party

[ ] I rent land from another party

[ ] Other (please specify): _____

6. How many years have you been farming? _____

7. Approximately, how many years has your farm been in your family? _____

8. Do you have crops on your farm?

[ ] Yes [ ] No

9. What types of crops do you have?

[ ] Corn
[ ] Soybeans
[ ] Alfalfa
[ ] Wheat
[ ] Sweet corn
[ ] Peas
[ ] Other (please specify): _____

10. Approximately, what percentage of your total farming enterprise is made up of each crop?

Corn: _____
Soybeans: _____
Alfalfa: _____
Wheat: _____
Sweet corn: _____
Peas: _____
Other: _____
Other : _____
Total: _____

11. Do you have livestock on your farm?

[ ] Yes [ ] No

12. What type of livestock do you have? *(Please check all that apply)*

[ ] Pigs
[ ] Cattle
[ ] Chickens
[ ] Sheep
[ ] Other (please specify): _____

13. Approximately, what percent of your total livestock is made up of each?

Pigs: _____
Cattle: _____
Chickens: _____
Sheep: _____
Other: _____
Total: _____

14. Are you involved in any farming-related organization/associations in your community?

[ ] MN Corn Growers Association
[ ] MN Soybean Growers Association
[ ] MN Farmers Union
[ ] American and/or MN Farm Bureau
[ ] Other (please specify):_____

15. How do you get information about available conservation programs or events? (Please check all that apply)

[ ] Word of mouth (1)
[ ] Postcard from a local agency (2)
[ ] Website of a local agency (3)
[ ] Local newsletter or newspaper
[ ] Website of a state or federal agency (5)
[ ] Other agricultural organizations (Please specify): _____
[ ] Other environmental organizations (Please specify): _____

16. What is your gender?

[ ] Male [ ] Female

17. In what year were you born? _____

18. What is the highest level of formal education you have completed?

[ ] Did not finish high school
[ ] Completed high school/GED
[ ] Some college but no degree
[ ] Associate degree or vocational degree
[ ] College bachelor's degree
[ ] Some graduate work
[ ] Completed graduate degree (Masters or PhD)

19. What percent of your income is dependent on agricultural production?

[ ] 0% (1)
[ ] 1-25% (2)
[ ] 26-50% (3)
[ ] More than 50% (4)

20. Which category best describes your total household income from all sources in 2017 before taxes?

[ ] Under $10,000 (1)
[ ] $10,000 - $24,999 (2)
[ ] $25,000 - $34,999 (3)
[ ] $35,000 - $49,999 (4)
[ ] $50,000 - $74,999 (5)
[ ] $75,000 - $99,999 (6)
[ ] $100,000 - $149,999 (7)
[ ] $150,000 or more (8)

21. How would you describe your race? (Please check all that apply)

[ ] White
[ ] Black or African American
[ ] American Indian or Alaska Native
[ ] Asian Indian
[ ] Native Hawaiian
[ ] Pacific Islander
[ ] Chinese
[ ] Japanese
[ ] Korean
[ ] Vietnamese
[ ] Filipino
[ ] Other Race (Please specify)

Appendix J: Survey Findings, Descriptive Analyses

Table 1. Respondents' sociodemographic characteristics

Socio-Demographic characteristics		N	Percent
Gender	Male	202	78.3
	Female	56	21.7
Race*	White	292	98.3
	Hispanic, Latino or Spanish Heritage	0	0
	Black or African American	0	0
	Asian	1	0.003
	American Indian or Alaska Native	0	0
	Middle Eastern or North African	0	0
	Native Hawaiian or Other Pacific Islander	0	0
	Other (e.g., American, human)	4	0.01
Age	Median	67	-
	Minimum	28	-
	Maximum	98	-
Years lived in community	Median	54	-
	Minimum	0	-
	Maximum	90	-
Formal education	Did not finish high school	8	2.8
	Completed high school	91	32.3
	Some college but no degree	38	13.5
	Associate or vocational degree	63	22.3
	College bachelor's degree	49	17.4
	Some college graduate work	10	3.5
	Completed graduate degree (MS or PhD)	23	8.2
Household income	Under $20,000	8	3.7
	$20,000-$49,999	45	20.5
	$50,000-$74,999	54	24.7
	$75,000-$99,999	41	18.7
	$100,000-$149,999	39	17.8
	$150,000-$199,999	15	6.8
	$200,000-$249,999	5	2.3
	$250,000-$299,999	2	0.9
	$300,000 or more	10	4.6

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Questions 1, 31, 32, 33, 34, and 35

*Respondents could give more than one response.

Table 4. Respondents' perception of their community

Response	N	Percent
My neighborhood	123	40.5
My city	66	21.7
My township	48	15.8
My county	45	14.8
My watershed	6	2.0

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 2

Table 5. Respondents' perceived importance of the qualities of a community

	N	Mean*	SD[a]	Very unimportant[b]	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
Good relationships among neighbors	297	1.40	1.07	6.1	2.0	2.7	24.6	64.6
Strong family ties	298	1.37	1.13	6.7	2.0	5.0	19.8	66.4
Clean streams, rivers and lakes	299	1.32	1.06	5.4	2.7	4.7	29.4	57.9
Access to natural areas/views	297	0.96	1.12	5.4	4.7	18.2	32.0	39.7
Opportunities for outdoor recreation	298	0.92	1.18	6.7	5.7	16.4	31.5	39.6
Opportunities to be involved in community projects	298	0.65	0.98	4.4	6.0	27.2	44.6	17.8
Opportunities to express my culture and traditions	299	0.48	1.05	4.7	10.7	34.8	31.8	18.1

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 3

*Responses based on a 5-point scale from very unimportant (-2) to very important (2)

[a] SD=Standard deviation

[b] Percent

Table 11. Respondents' beliefs about responsibility for water resource protection

	N	Mean*	SD[a]	Strongly disagree[b]	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
It is my personal responsibility to make sure that what I do on the land doesn't contribute to water resource problems.	297	1.35	0.72	0.3	1.0	9.4	41.8	47.5
It is my personal responsibility to help protect water.	300	1.28	0.76	0.7	0.3	13.3	41.7	44.0
Landowners upstream should be responsible for protecting water downstream.	300	1.25	0.81	0.3	2.3	14.3	38.3	44.7
Farmers in my watershed should be responsible for protecting water.	300	1.22	0.80	1.0	1.7	12.0	44.7	40.7
Urban residents in my watershed should be responsible for protecting water.	299	1.05	1.00	4.3	2.7	13.4	43.1	36.5
Local government should be responsible for protecting water.	300	0.51	1.17	9.3	9.7	19.3	43.7	18.0
The state government should be responsible for protecting water.	299	0.23	1.24	14.0	12.0	23.7	37.1	13.0

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 8

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (+2)

[a] SD=Standard deviation

[b] Percent

Table 12. Respondents' perceptions about pollutants/issues in their watershed

	N	Mean*	SD[a]	Not a problem[b]	Slight problem	Moderate problem	Severe problem	Don't know
Nitrogen in surface water	188	2.56	0.95	8.4	22.9	19.9	12.1	36.7
Sediment (cloudiness)	224	2.56	0.90	9.1	26.9	27.6	11.8	24.6
Phosphorus	184	2.52	0.94	8.9	23.2	19.8	10.9	37.2
Flooding	251	2.51	0.95	12.4	31.5	25.5	14.8	15.8
Algae	204	2.48	1.02	15.0	18.7	23.5	12.2	30.6
Pesticides	204	2.41	1.03	16.1	20.5	19.8	12.1	31.5
Nitrogen in drinking water	180	2.22	1.05	19.3	18.0	14.6	9.2	39.0
E. coli (bacteria)	164	2.07	0.99	19.7	18.3	11.9	5.8	44.4
Drought	230	1.96	0.94	30.2	27.1	14.6	6.1	22.0

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 9

*Responses based on a 4-point scale from not a problem (1) to severe problem (4);

[a] SD=Standard deviation

[b] Percent

Table 14. Respondents' concern about the consequences of water pollution for the following

I am concerned about the consequences of water pollution for...	N	Mean*	SD[a]	Strongly disagree[b]	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Future generations	299	1.26	0.93	3.0	2.0	9.4	36.8	48.8
My or my family's health	299	1.09	1.00	4.0	2.7	13.4	39.8	40.1
People in my community	298	1.05	1.03	4.0	4.0	14.8	37.6	39.6
Aquatic life	299	0.99	1.09	5.4	2.7	19.1	33.1	39.8
Farmland	299	0.97	1.08	5.0	4.0	17.7	35.8	37.5
Wildlife	298	0.93	1.06	5.0	3.4	19.8	37.2	34.6

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 11

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (+2)

[a] SD=Standard deviation

[b] Percent

Table 21. Respondent's engagement in civic actions in the past 12 months

In the past 12 months how often have you...	N	Mean*	SD[a]	Never[b]	Every few months	Every month	Every two weeks	Weekly or more
Volunteered for community organizations or events?	292	0.88	1.10	49.0	27.4	16.1	2.1	5.5
Talked to others about conservation practices?	292	0.76	0.82	41.1	46.6	8.9	1.7	1.7
Heard about a water resource protection initiative?	292	0.72	0.92	51.0	33.6	10.3	3.1	2.1
Attended a meeting or public hearing about water?	293	0.36	0.57	67.6	30.0	1.7	0.3	0.3
Participated in a water resource protection initiative?	290	0.30	0.69	77.6	18.6	1.7	0.3	1.7
Worked with other community members to protect water?	289	0.27	0.58	78.2	18.3	2.8	0.0	0.7
Taken a leadership role around water resource conservation in the community?	293	0.11	0.47	93.2	4.1	2.0	0.0	0.7

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 18

*Responses based on a 5-point scale from never (0) to weekly or more (4)

[a] SD=Standard deviation

[b] Percent

Table 22. Respondents' intentions to engage in civic actions in the next 12 months

In the past 12 months, I intend to...	N	Mean*	SD[a]	Most certainly not[b]	Probably not	Uncertain	Probably will	Most certainly will
Learn more about conservation practices	293	0.26	0.94	3.8	17.4	33.8	39.2	5.8
Talk to others about conservation practices	294	0.14	0.96	4.4	21.8	34.4	34.7	4.8
Attend a meeting or public hearing about water	295	0.04	0.98	5.8	23.4	36.9	28.5	5.4
Learn more about water resource issues in my watershed	294	0.01	0.95	5.4	24.1	38.8	27.2	4.4
Contact conservation assistance professionals (e.g. my soil and water conservation district or the Natural Resources Conservation Service) about water resource initiatives	293	-0.03	1.07	9.6	23.5	33.1	27.6	6.1
Work with other community members to protect water	295	-0.11	0.90	6.4	23.7	46.4	20.7	2.7

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 19

*Responses based on a 5-point scale from most certainly not (-2) to most certainly will (2)

[a] SD=Standard deviation

[b] Percent

Table 24. Respondents' most trusted sources of information

	N	Percent*
My county's Soil and Water Conservation District	93	30.6%
Farmers	67	22.0%
My family	59	19.4%
My neighbors	51	16.8%
The Farm Service Agency (USDA)	47	15.5%
The MN Department of Natural Resources	44	14.5%
The National Resource Conservation Service (NRCS)	38	12.5%
My local extension agent	38	12.5%
My agronomist/agricultural advisor	37	12.2%
The MN Department of Agriculture	35	11.5%
University researchers	34	11.2%
The MN Pollution Control Agency	31	10.2%
My county's Farm Bureau	27	8.9%
My local co-op	21	6.9%
Certified crop advisors (CCA)	19	6.3%
Agricultural commodity associations (e.g., Minnesota Corn Growers Association)	13	4.3%
Seed/input dealer	11	3.6%
Environmental advocacy organizations	10	3.3%
Other (e.g., news, renters, articles)	5	1.6%
Farmer's Union	3	0.9%
My financial institution (e.g., financial advisor, loan officer, mortgage lender, etc.)	1	0.3%

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 22

*Percent of all survey respondents (N = 304); Respondents could give more than one response; Rank ordered by percent

Table 25. Respondents' perceived social norms of conservation action

	N	Mean*	SD[a]	Strongly disagree[b]	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
People who are important to me attend meetings or public hearings about water.	296	0.16	0.92	6.4	11.1	47.3	30.1	5.1
People who are important to me work with other community members to protect water.	295	0.16	0.92	6.4	9.5	51.5	26.4	6.1
People who are important to me talk to others about conservation practices.	296	0.11	0.86	5.4	11.1	54.4	24.7	4.4
People who are important to me expect me to work with other community members to protect water.	296	0.08	0.87	7.1	7.4	60.8	19.3	5.4
People who are important to me expect me to attend meetings or public hearings about water.	295	-0.01	0.95	9.8	11.9	52.2	22.0	4.1
People who are important to me expect me to talk to others about conservation practices.	296	-0.02	0.92	8.8	12.8	54.4	19.6	4.4

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 15

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (+2)

[a] SD=Standard deviation

[b] Percent

Appendix K: Survey Findings, Subgroup Comparisons

Subgroup comparisons: Levels of clean water action

Table 1. Number of respondents by adoption of clean water actions

Levels of clean water action[a]	n	Percent
Low action	142	53.2
High action	125	46.8
Total	267	100.0

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Lower Minnesota Watershed, Question 16

[a]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions

Note: Only respondents who reported using their land for agricultural production (n = 267) are used for this analysis; drainage tiles (survey question 16e) is also removed from these analyses.

Table 2. Differences between high and low adopters of clean water actions in their beliefs about neighborhood qualities

Survey item[a]	Levels of clean water action[b]	n	Mean	SD	t[c]
Good relationships among neighbors	Low	138	1.22	1.18	2.593
	High	123	1.56	0.93	
Opportunities to be involved in community projects	Low	139	0.47	1.02	3.131
	High	124	0.85	0.93	
Opportunities to express my culture and traditions	Low	139	0.32	1.08	2.613
	High	124	0.66	1.05	
Clean streams, rivers and lakes	Low	139	1.12	1.14	2.929
	High	124	1.49	0.92	

[a]Items measured on a five-point scale from very unimportant (-2) to very important (+2)

[b]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions

[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here.

SD = Standard deviation

Table 3. Difference between high and low adopters of clean water actions in their familiarity with water issues, beliefs about water pollution and conservation practices, personal and social norms

Survey item	Levels of clean water action[c]	n	Mean	SD	t[d]
Familiarity with water issues[a]					
Familiarity with water issues in their watershed	Low	141	2.60	0.99	2.958
	High	123	2.92	0.75	
Beliefs about water pollution and conservation practices[b]					
Water pollution affects human health	Low	140	1.19	0.97	3.156
	High	124	1.52	0.64	
Conservation practices protect aquatic life	Low	141	0.94	0.95	3.317
	High	123	1.29	0.72	
Conservation practices contribute to quality of life in my community	Low	140	0.69	1.10	3.321
	High	124	1.08	0.85	
Conservation drainage management reduces water runoff from farmland	Low	141	0.87	1.01	2.665
	High	123	1.18	0.84	
Drainage tiling increases crop yield	Low	141	1.44	0.81	3.067
	High	122	1.71	0.60	
Personal norms[b] (I feel a personal obligation to...)					
Do whatever I can to prevent water pollution	Low	139	0.87	0.80	4.441
	High	122	1.28	0.67	
Maintain my land/farm in a way that <u>does not</u> contribute to water resource problems	Low	139	0.91	0.87	5.587
	High	122	1.43	0.59	
Talk to others about conservation practices	Low	139	0.32	0.80	4.120
	High	121	0.74	0.84	
Use conservation practices on my land/property	Low	138	0.71	0.77	7.047
	High	123	1.33	0.65	
Work with other community members to protect water resources	Low	139	0.24	0.75	3.743
	High	121	0.60	0.79	
Attend meetings or public hearings about water	Low	139	0.10	0.85	4.321
	High	120	0.54	0.79	
Social norms[b]					
People who are important to me expect me to attend meetings or public hearings about water	Low	138	-0.17	0.92	2.811
	High	124	0.15	0.96	
People who are important to me attend meetings or public hearings about water	Low	138	-0.01	0.90	3.248
	High	124	0.35	0.90	

[a]Item measured on a four-point scale from not at all familiar (1) to very familiar (4)
[b]Items measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)
[c]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions
[d]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here
SD = Standard deviation

Table 4. Difference between high and low adopters of clean water actions in their perceived ability and motivations for practice adoption

Survey item	Levels of clean water action[b]	n	Mean	SD	t[c]
Perceived ability[a]					
My use of a conservation practice contributes to healthy water resources	Low	139	0.98	0.74	-3.736
	High	125	1.32	0.75	
By taking an active part in conservation, people can keep water clean in Minnesota	Low	140	1.04	0.82	-3.282
	High	125	1.35	0.74	
I have the knowledge and skills I need to use conservation practices on the land	Low	140	0.52	0.93	-5.215
	High	125	1.09	0.83	
I can learn almost anything about natural resource stewardship if I set my mind to it	Low	141	0.86	0.89	-3.032
	High	125	1.17	0.76	
Weather has a big impact on my decisions about conservation practices on the land	Low	141	0.46	0.99	-3.556
	High	124	0.90	0.99	
Motivators of practice adoption[a] (I would be more likely to adopt new conservation practices or continue to use practices if...)					
I had access to financial resources to help me adopt conservation practices	Low	137	0.34	1.04	-2.703
	High	123	0.69	1.08	
I could get higher payments for adopting conservation practices	Low	137	0.52	1.00	-4.264
	High	123	1.04	0.97	
I could learn how to maintain conservation practices for soil conservation	Low	137	0.22	0.71	-2.712
	High	122	0.48	0.86	
I was compensated for lost crop production because of conservation practices	Low	137	0.59	1.06	-3.052
	High	123	0.99	1.05	

[a]Items measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)
[b]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions
[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here
SD = Standard deviation

Table 5. Differences between high and low adopters of clean water actions in their levels of civic engagement

Survey item[a]	Levels of clean water action[b]	n	Mean	SD	t[c]
Volunteered for community organizations or events?	Low	139	0.69	1.03	3.137
	High	119	1.12	1.16	
Participated in a water resource protection initiative?	Low	137	0.15	0.36	3.838
	High	120	0.45	0.82	
Worked with other community members to protect water?	Low	136	0.15	0.36	3.640
	High	120	0.37	0.59	
Talked to others about conservation practices?	Low	138	0.57	0.74	4.640
	High	121	1.02	0.80	
Attended a meeting or public hearing about water?	Low	139	0.27	0.51	2.941
	High	120	0.47	0.55	

[a]Items measured on a five-point scale from never (0) to weekly or more (4)
[b]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions
[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here.
SD = Standard deviation

Table 6. Differences between high and low adopters of clean water actions in the extent to which their conservation decisions are influenced by individuals or groups

Survey item[a]	Levels of clean water action[b]	n	Mean	SD	t[c]
My family	Low	130	2.49	1.02	4.537
	High	119	3.05	0.91	
Farmers	Low	131	2.49	0.97	3.115
	High	118	2.86	0.88	
My neighbors	Low	128	2.27	0.95	3.247
	High	119	2.66	0.93	
My county's Soil and Water Conservation District	Low	128	2.31	0.90	4.027
	High	118	2.77	0.88	
University researchers	Low	128	1.70	0.78	4.034
	High	114	2.16	0.97	
The MN Department of Natural Resources	Low	128	1.85	0.86	3.440
	High	113	2.27	1.05	
The MN Department of Agriculture	Low	127	2.06	0.87	3.050
	High	118	2.42	0.98	
The Farm Service Agency (USDA)	Low	127	2.12	0.91	4.251
	High	117	2.62	0.94	
The National Resource Conservation Service (NRCS)	Low	122	1.89	0.93	5.292
	High	112	2.55	1.00	
My local extension agent	Low	124	1.85	0.90	3.341
	High	112	2.26	0.99	
Certified crop advisors (CCA)	Low	119	1.63	0.85	3.797
	High	111	2.10	1.02	
My local co-op	Low	122	1.71	0.83	2.742
	High	116	2.03	0.98	
My agronomist/agricultural advisor	Low	115	1.74	0.94	5.381
	High	111	2.44	1.02	

[a]Items measured on a four-point scale from not at all (1) to a lot (4)
[b]Based on an index of survey questions 16a through 16o. High action = respondents who have used 7 or more of the 14 clean water actions, low action = respondents who have used 6 or fewer of the 14 clean water actions
[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here.
SD = Standard deviation

Subgroup comparisons: Levels of civic engagement

Table 7. Number of respondents by levels of civic engagement

Levels of civic engagement[a]	N	Percent
Low	121	39.8
High	183	60.2
Total	304	100.0

Source: Your Perspectives on Local Water Resources: A Survey of Landowners in Nicollet County, Question 18
[a]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months

Table 8. Difference between respondents with varying levels of civic engagement in their gender

Levels of civic engagement[a]	Gender[b]		χ^2
	Male	Female	
Low	33.2	53.6	7.780
High	66.8	46.4	
	100	100	

[a]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months
[b]Percent
χ^2 Chi-square statistic for testing differences in proportions; $p \leq 0.01$

Table 9. Difference between respondents with varying levels of civic engagement in their perceived importance of the qualities of a community

Survey item[a]	Levels of civic engagement[b]	N	Mean	SD	t[c]
Opportunities to be involved in community projects	Low	119	0.47	1.05	2.656
	High	179	0.78	0.92	

[a]Items measured on a five-point scale from very unimportant (-2) to very important (+2)
[b]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months
[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here.
SD = Standard deviation

Table 10. Difference between respondents with varying levels of civic engagement in their familiarity with water issues, beliefs about practices, responsibility, perceived ability, perceived control, and perceived influence

Survey item	Levels of civic engagement[d]	n	Mean	SD	t[e]
Familiarity with water issues[a]					
Familiarity with water issues in their watershed	Low	119	2.34	0.92	6.167
	High	181	2.97	0.83	
Beliefs about practices[b]					
Drainage tiling increases crop yield	Low	117	1.32	0.85	3.479
	High	179	1.64	0.72	
Responsibility[b]					
It is my personal responsibility to help protect water	Low	1.04	0.83	1.04	4.530
	High	1.43	0.66	1.43	
It is my personal responsibility to make sure that what I do on the land doesn't contribute to water resource problems	Low	1.21	0.79	1.21	2.660
	High	1.44	0.66	1.44	
Perceived ability[b]					
My use of a conservation practice contributes to healthy water resources	Low	117	1.01	0.80	3.049
	High	182	1.27	0.69	
I have the knowledge and skills I need to use conservation practices on the land	Low	117	0.47	1.00	5.312
	High	183	1.03	0.80	
I have the financial resources I need to use conservation practices on the land	Low	117	-0.25	1.11	3.552
	High	182	0.23	1.15	
Perceived control[b]					
If there is someone I want to meet in my community, I can usually arrange it	Low	118	0.77	0.95	4.105
	High	180	1.19	0.80	
I find it easy to play an important role in most group situations within my community	Low	120	0.10	0.91	3.380
	High	180	0.46	0.88	
Most of what happens on my farm/land is beyond my control	Low	116	-0.13	1.11	-2.808
	High	180	-0.49	1.05	
Perceived influence[c]					
Protecting clean water in the area	Low	116	1.59	0.86	2.667
	High	181	1.84	0.76	
Inspiring or organizing others to take action in the community	Low	117	1.21	0.84	3.761
	High	180	1.56	0.77	

[a]Item measured on a four-point scale from not at all familiar (1) to very familiar (4)
[b]Items measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)
[c]Items measured on a four-point scale from not at all (0) to a lot (3)
[d]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months
[e]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here
SD = Standard deviation

Table 11. Differences between respondents with varying levels of civic engagement in their personal and social norms

Survey item	Levels of civic engagement[b]	n	Mean	SD	t[c]
Personal norms[a] (I feel a personal obligation to...)					
Do whatever I can to prevent water pollution	Low	113	0.88	0.81	3.546
	High	182	1.21	0.75	
Maintain my land/farm in a way that does not contribute to water resource problems	Low	113	0.87	0.88	4.702
	High	182	1.32	0.76	
Talk to others about conservation practices	Low	112	0.26	0.77	3.947
	High	182	0.65	0.87	
Use conservation practices on my land/property	Low	113	0.81	0.80	3.678
	High	182	1.15	0.79	
Attend meetings or public hearings about water	Low	111	0.07	0.81	3.432
	High	182	0.42	0.87	
Social norms[a]					
People who are important to me expect me to talk to others about conservation practices	Low	115	-0.30	0.87	4.201
	High	181	0.15	0.92	
People who are important to me talk to others about conservation practices	Low	115	-0.11	0.85	3.713
	High	181	0.26	0.84	
People who are important to me expect me to attend meetings or public hearings about water	Low	115	-0.20	0.95	2.731
	High	180	0.11	0.93	
People who are important to me attend meetings or public hearings about water	Low	115	-0.11	0.91	4.213
	High	181	0.34	0.89	
People who are important to me expect me to work with other community members to protect water	Low	115	-0.14	0.86	3.582
	High	181	0.23	0.86	
People who are important to me work with other community members to protect water	Low	114	-0.05	0.91	3.260
	High	181	0.30	0.89	

[a]Items measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)

[b]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months

[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here

SD = Standard deviation

Table 12. Difference between respondents with varying levels of civic engagement in the extent to which their conservation decisions are influenced by individuals or groups

Survey item[a]	Levels of civic engagement[b]	n	Mean	SD	t[c]
My county's Soil and Water Conservation District	Low	102	2.32	0.92	3.608
	High	173	2.73	0.88	
The Farm Service Agency (USDA)	Low	99	2.14	0.97	3.154
	High	173	2.52	0.94	
The National Resource Conservation Service (NRCS)	Low	94	1.94	1.00	3.295
	High	166	2.36	1.00	
Agricultural commodity associations (e.g., Minnesota Corn Growers Association)	Low	90	1.51	0.77	3.475
	High	162	1.91	0.92	
My agronomist/agricultural advisor	Low	90	1.76	0.99	3.487
	High	157	2.22	1.03	

[a]Items measured on a four-point scale from not at all (1) to a lot (4)

[b]Based on an index of survey questions 18a through 18g. High = respondents who have participated in 2 or more of the 7 community activities in the past 12 months, low = respondents who have participated in 1 or fewer of the 7 community activities in the past 12 months

[c]T-test statistic for testing differences in means. Only items with statistical differences at a significance level of $p \leq 0.01$ reported here

SD = Standard deviation

4.3 Public Outreach and Education

4.3.1 Newsletters:

Newsletters where sent out over the course of the WRAPS project to promote or inform the public on various stages and activities related to the WRAPS project. Sibley Soil and Water Conservation District mail its quarterly newsletter to 2541 households on 4 separate occasions during the WRAPS process. The Rush River/High Island Creek "River Watcher" newsletter was mailed to 1700 households on 3 separate occasions during the WRAPS process.

4.3.2 Ney Center Public Educational Meeting:

On July 26th, 2017 a WRAPS educational meeting was held at the Ney Center in Henderson, MN. Postcards promoting the event where mailed out to 1700 households located within the Lower Minnesota River watershed a month in advance of the meeting. This event was attended by 8 members of the public and included guest speakers from the MN DNR, MPCA and SWCD. Topics discussed included DNR watershed assessments, the state of watershed fisheries, as well as the WRAPS process and what it means for the future of water quality and landowner actions within the Lower Minnesota River Watershed.

4.3.3 Coffee Shop Talks:

During the WRAPS project, 3 "coffee shop talks" where held in Sibley County. The first was held on 2/26/2018 at the Henderson Roadhaus in Henderson, MN. This event was attended by 7 member of the public, 3 Sibley SWCD employees, and 1 MPCA employee. Notes on the topics of conservation are listed below:

- Road Salt issues, excess put on road contributing to water quality issues
- People making laws have no farming experience and don't come out to talk to farmers about issues
- Water quality within wells
- Mother nature didn't create a stream to handle this much water
- "Man made" ditches adding too much water
- 6 semi loads being taken out of ditch by landowner on own
- Engineering designs made not be able to handle the correct amount of water
- Settling ponds on farmland, meter out (water control drainage)
- Buffer law impacts – long term good, ditch cleaning – piling along the bank, problems with noxious weeds, widths/access not adequate if landowners responsible with weed control
- Switch from Nitrogen to Phosphorus concerns?
- Some water quality improvement over the years
- Plenty of precipitation in the past and hasn't changed over the years
- Water was handled differently in the past
- Rush River has come up faster than the MN River (MN river has been improved to handle it)
- State agencies working together on projects
- Restoration of wetlands or other water retention needs
- Get rid of all open intakes (Another demonstration day of open intake alternatives?)
- Cover crops – questions on doing them with corn and soybeans and benefits of that
- Vegetative strips around ravines – less erosion
- More CRP acres – the right acres, no whole farms, paid too high

- Living snow fence questions/rates
- CRP rates for river bottom areas
- Feedlot questions
- Rule maker having farming experience
- Worried that the farmers don't get a vote
- Conservation groups (Ducks Unlimited, Pheasants Forever) may be in the back pocket of legislators
- More contact with legislators – last meeting was couple years ago
- Taxes on public lands getting taken off the tax roles
- Water quality concerns over the ponds on Colony lands,
- Municipalities need more oversight
- Potentially help testing water quality on Rush River
- Manure hauling distance has increased from years past
- East vs. West debate (County)
- Rush River does most of the damage erosion wise because nothing has been done for years
- Different incentives would make implementing practices more appealing
- Government shouldn't be competing with producers
- Economy – farmers not putting extra fertilizers
- Using manure as a commodity

A second meeting was held on 2/27/2018 at the Pit Stop in Gibbon, MN. This meeting was attended by 2 members of the public, 3 Sibley SWCD employees, 1 MPCA employee, and 1 Nicollet County employee. Notes on the topics of conservation are listed below:

- West vs. East Topic
- Holding more water in the western part of Sibley County – have more ponds from implementing wetland restorations
- Differences between the right/wrong land going into the CRP program
- Landowners putting land into CRP because they get more money from the CRP payment then they do for land rent (Hunting backgrounds influence decision as well)
- Targeting sensitive areas for CRP
- Increased sedimentation and nutrient loading
- Good job of putting clean water into ditches but dilutes up by the time if flows into the MN river
- Feel a good job has been done addressing some point source pollution areas
- Channelization increased water speed – Rush River has been dredged and straightened out
- Testing water quality in wells – see more testing (talked about Brown County testing their wells)
- Would like to see more cover crops around

    - Canning crops/small grain works well
    - Hurdles for implementing on cash crops

- Very worried about pre-emergence affecting cover crop growth
- Owner/operators easier to target for cover crops
- Renters/Landowners with larger acreages harder to target (lack of time)
- Tillage changes are easier to adopt (mulch, ridge, strip till) – possibly cheaper than cover crops
- Restrictive seeding dates for cover crops
- Particular about what species can be a successful cover crop
- Would like to see more removal of open intakes and rock tile inlets
- Input conservation talk that would benefit both parties during contract talks
- Find a common ground among landowner/renter
- Go to system like Europe and get "rid" of nutrients
- Issues with phosphorus in cities/towns not being treated
- Nutrients coming out of outlet at treatment ponds?
- How often are cities sampling their discharges?
- Addressing storm water/sewer water
- It may take a generation or two to implement new ways of farming (cover crops) – older generations do not like change
- Incentives make cover crops more appealing

A third coffee shop talk was held at the Prairie House in Gaylord, MN. No members of the public where in attendance.

4.3.4 Sibley County Fair 2017:

Sibley SWCD had information on WRAPS available at its fair booth during the Sibley County Fair. This served as another opportunity to gather input on landowner conservation action and opinions. Sibley SWCD staff also discussed with landowners and members of the public how they can become involved in the WRAPS process and what it means for the future of the watershed.

4.3.5 Breakfast on the Farm 2017:

Sibley SWCD had information on WRAPS available at its booth at the annual Breakfast on the Farm event held by the Arlington Area Chamber of Commerce.

4.4 Long-term Results

4.4.1 Capacity Building

The Lower Minnesota River WRAPS gave Sibley County the opportunity to partner with the University of Minnesota's Center for Changing Landscapes. This partnership resulted in extensive surveying and interviewing of landowners within the Lower Minnesota River Watershed. Survey methods, results and analyses of these surveys where distributed throughout the watershed to Local Government Technical staff in a report titled *An Assessment of Landowner Conservation Action in the Lower Minnesota Watershed.* The analyses of these landowner surveys and interviews was also summarized and presented to Local Government Staff within the watershed at the meeting held on 7/31/2018 at the Sibley SWCD office in Gaylord, MN. The key messages from this report are highlighted below:

    - Social influences drive conservation decision making.

- Stewardship ethic and perceived benefits to land and community drive practice adoption.
- Financial incentives and conservation program reformation are important drivers of practice adoption.
- Multiple factors can constrain conservation action;
  - Lack of equipment
  - Financial
  - Community leadership
- Lack of personal and social norms for civic action is a major constraint to community engagement in water protection.

This report will help guide Local Government conservation programs and outreach efforts within the Lower Minnesota River watershed by providing in depth insight into the human dimensions of conservation action.

4.4.2 Partnerships and Alliances

Sibley County and Sibley Soil and Water Conservation District enjoyed the opportunity to partner with the Minnesota Pollution Control Agency, the University of Minnesota's Center for Changing Landscapes, and Queenan Productions. Other local government staff from McLeod, Renville, Nicollet, Le Sueur and Rice counties also helped to provide valuable insight, guidance and information to the WRAPS process. These partnerships and connections will become increasingly important in the future as water management away from local plans with county boundaries towards a watershed focused approach.

4.4.3 Project Feedback

Many lessons were learned during the WRAPS process. Staff turnover and reorganization in Sibley County lead to some unseen hurdles and delays. Performing more outreach might have led to better turnout at Coffee Shop Talks.

5. Section III – Final Expenditures

	Task	1A	1B	1C	2	2A	2B	2C	2D	2E	3A	3B	4A	4B	Total
Sibley Coordinator	Budgeted	300	180	0	0	0	0	0	0	0	120	0	240	120	960
	Spent	300	180	0	0	0	0	0	0	0	120	0	240	120	960
	invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
McLeod Tech	Budgeted	154.8	154.8	0	0	0	0	0	0	0	0	0	51.6	0	361.2
	Spent	154.8	154.8	0	0	0	0	0	0	0	0	0	51.6	0	361.2
	invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Queenan	Budgeted	1944	0	0	0	0	6998.4	0	0	0	1944	7776	1296	0	19958.4
	Spent	1944.21	0	0	0	0	6998.4	0	0	0	1944	7776	1381.19	0	20043.8
	Invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	-0.21	0	0	0	0	0	0	0	0	0	0	-85.19	0	-85.4
Sibley SWCDWC/DT30	Budgeted	975	0	0	0	0	0	330	600	0	0	0	0	0	1905
	Spent	0	0	0	0	0	0	330	600	0	0	0	0	0	930
	invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	975	0	0	0	0	0	0	0	0	0	0	0	0	975
Sibley SWCD WC DT34.34	Budgeted	686.8	0	0	0	0	0	1373.6	686.8	0	2060.4	0	686.8	686.8	6181.2
	Spent	0	0	0	0	0	0	1116.05	0	0	0	0	0	0	1116.05
	Invoice 6	0	0	0	0	0	0	240.38	0	0	0	0	0	0	240.38
	Balance	686.8	0	0	0	0	0	17.17	686.8	0	2060.4	0	686.8	686.8	4824.77
Sibley SWCD WT 41	Budgeted	2460	184.5	0	0	0	0	0	1271	0	0	0	0	0	3915.5
	Spent	1640	184.5	0	0	0	0	0	2829	0	0	0	0	0	4653.5
	Invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	820	0	0	0	0	0	0	-1558	0	0	0	0	0	-738
Sibley SWCD WT 48.55	Budgeted	971	0	0	0	0	0	1942	971	0	1942	0	971	0	6797
	Spent	0	0	0	0	0	0	145.65	0	0	0	0	0	0	145.65
	invoice 6	0	0	0	0	0	0	267.03	0	0	0	0	0	0	267.03
	Balance	971	0	0	0	0	0	1529.32	971	0	1942	0	971	0	6384.32
Sibley SWCD DT2 32	Budgeted	1104	256	320	0	0	0	0	96	0	0	0	0	0	1776
	Spent	1104	256	0	0	0	0	0	96	0	0	0	0	0	1456
	Invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	0	0	320	0	0	0	0	0	0	0	0	0	0	320
UofM RA 39.54	Budgeted	0	9885	1977	0	27678	0	0	0	0	1186.2	0	1977	0	42703.2
Survey	Spent	0	5535.6	0	0	0	0	0	0	0	0	0	0	0	5535.6
	invoice 6	0	4349.4	1977	0	27678	0	0	0	0	1186.2	0	1977	0	
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UofM UA 12	Budgeted	0	480	0	0	1680	0	0	0	0	0	0	0	0	2160
survey	Spent	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	invoice 6	0	480	0	0	1680	0	0	0	0	0	0	0	0	
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UofM UA2 12	Budgeted	0	0	0	0	0	0	0	0	1200	0	0	0	0	1200
Interviews	Spent	0	0	0	0	0	0	0	0	600	0	0	0	0	600
	Invoice 6	0	0	0	0	0	0	0	0	600	0	0	0	0	
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UofM PI 41.77	Budgeted	0	0	0	0	0	0	0	0	3341.77	0	0	0	0	3341.77
interviews	Spent	0	0	0	0	0	0	0	0	1670.8	0	0	0	0	1670.8
	invoice 6	0	0	0	0	0	0	0	0	1670.97	0	0	0	0	
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UofM R3 33.375	Budgeted	0	0	0	0	0	0	0	0	10680	0	0	0	0	10680
	Spent	0	0	0	0	0	0	0	0	5340	0	0	0	0	5340
	Invoice 6	0	0	0	0	0	0	0	0	5340	0	0	0	0	5340
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sibley SWCD Postage	Budgeted	0	0	0	5666.2	0	0	0	0	0	0	0	0	0	5666.2
	Spent	0	0	0	565.72	0	0	0	0	0	0	0	0	0	565.72
	Invoice 6	0	0	0	647.16	0	0	0	0	0	0	0	0	0	647.16
	Balance	0	0	0	4453.32	0	0	0	0	0	0	0	0	0	4453.32
UofM Postage	Budgeted	0	0	0	2450	0	0	0	0	0	0	0	0	0	2450
	Spent	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invoice 6	0	0	0	2450	0	0	0	0	0	0	0	0	0	2450
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U of M Printing	Budgeted	0	0	0	4550	0	0	0	0	0	0	0	0	0	4550
	Spent	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invoice 6	0	0	0	4550	0	0	0	0	0	0	0	0	0	4550
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sibley SWCD Printing	Budgeted	0	0	0	12150	0.00	0	0	0	0	0	0	0	0	12150
	Spent	0	0	0	10532.32	0	0	0	0	0	0	0	0	0	10532.32
	invoice 6	0	0	0	1617.68	0	0	0	0	0	0	0	0	0	1617.68
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supplies U of M Interviews	Budgeted	0	0	0	1000	0	0	0	0	0	0	0	0	0	1000
	Spent	0	0	0	500	0	0	0	0	0	0	0	0	0	500
	invoice 6	0	0	0	500	0	0	0	0	0	0	0	0	0	500
	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supplies- Queenan	Budgeted	0	0	0	320	0	0	0	0	0	0	0	0	0	320
	Spent	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	0	0	0	320	0	0	0	0	0	0	0	0	0	320
Supplies- Sibley SWCD	Budgeted	0	0	0	4542.03	0	0	0	0	0	0	0	0	0	4542.03
	Spent	0	0	0	113.83	0	0	0	0	0	0	0	0	0	113.83
	Invoice 6	0	0	0	1698.63	0	0	0	0	0	0	0	0	0	1698.63
	Balance	0	0	0	2729.57	0	0	0	0	0	0	0	0	0	2729.57
Mileage- Sibley SWCD	Budgeted	0	0	0	100	0	0	0	0	0	0	0	0	0	100
	Spent	0	0	0	66.88	0	0	0	0	0	0	0	0	0	66.88
	Invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Balance	0	0	0	33.12	0	0	0	0	0	0	0	0	0	33.12
Mileage	Budgeted	0	0	0	1000	0	0	0	0	0	0	0	0	0	1000
Survey	Spent	0	0	0	78.84	0	0	0	0	0	0	0	0	0	78.84
	invoice 6	0	0	0	920.96	0	0	0	0	0	0	0	0	0	920.96
UofM	Balance	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0.2
Mileage	Budgeted	0	0	0	1282.5	0	0	0	0	0	0	0	0	0	1282.5
Interviews	Spent	0	0	0	641.33	0	0	0	0	0	0	0	0	0	641.33
	invoice 6	0	0	0	641.17	0	0	0	0	0	0	0	0	0	641.17
UofM	Balance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mileage	Budgeted	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Queenan	Spent	0	0	0	235	0	0	0	0	0	0	0	0	0	235
	invoice 6	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Balance	0	0	0	-235	0	0	0	0	0	0	0	0	0	-235
Budgeted		8595.6	11140.3	2297	33060.73	29358	6998.4	3645.6	3624.8	15221.77	7252.6	7776	5222.4	806.8	135000
Spent 1-5		5143.01	6310.9	0	12733.92	0	6998.4	1591.7	3525	7610.8	2064	7776	1672.79	120	55546.52
invoice 6		0	4829.4	1977	13025.6	29358	0	507.41	0	7610.97	1186.2	0	1977	0	60471.58
Balance		3452.59	0	320	7301.21	0	0	1546.49	99.8	0	4002.4	0	1572.61	686.8	18981.9

Invoice	Vendor	Program Element	Budget Category	Amount
2017-001	McLeod	1A	McLeod	154.8
2017-001	McLeod	1B	McLeod	154.8
2017-001	McLeod	4A	McLeod	51.6
2017-001	Queenan	1A	Queenan	1944.21
2017-001	Queenan	2B	Queenan	1186.79
2017-001	Sibley County	1A	Sibley County	300
2017-001	Sibley County	1B	Sibley County	180
2017-001	Sibley County	3A	Sibley County	120
2017-001	Sibley County	4A	Sibley County	240
2017-001	Sibley County	4B	Sibley County	120
2017-001	Sibley SWCD	2D	newsletter	1870.31
2017-001	Sibley SWCD	newsletter	newsletter	1945
2017-001	Sibley SWCD	newsletter	newsletter	677.51
2017-001	Sibley SWCD	1A	Sibley SWCD	1104
2017-001	Sibley SWCD	1B	Sibley SWCD	256
2017-001	Sibley SWCD	2D	Sibley SWCD	96
2017-001	U Survey	1b,2A	U Survey	5614.44
2017-002	Hub Publishing	2	newsletter	1683.28
2017-002	Hub Publishing	2	newsletter	796.22
2017-002	Hub Publishing	2	newsletter	1985
2017-002	Jerry's home foods	2	Supplies	2.47
2017-002	Kick's Bake Shop	2	Supplies	35.96
2017-002	Queenan	2B	Queenan	1944
2017-002	Queenan	3B	Queenan	4147.2
2017-002	Sibley SWCD 30	2C,2D	Sibley SWCD	180
2017-002	Sibley SWCD 30	2C,2D	Sibley SWCD	750
2017-002	Sibley SWCD 41	1A,1B,2C	Sibley SWCD	1824.5
2017-002	Sibley SWCD mileage	2	Sibley SWCD	66.88
2017-002	USPS	2	postage	238.29
2017-002	USPS	2	postage	327.43
2018-001	Hub Publishing	newsletter	newsletter	1575
2018-001	Queenan	2C,3B	Queenan	10,821.60
2018-001	Queenan	3B	Queenan	235
2018-001	Sibley SWCD	2B	Sibley SWCD	1116.05
2018-001	Sibley SWCD 41	2B	Sibley SWCD	2829
2018-002	D's Pit stop	2	Supplies	7.5
2018-002	Kick's Bake Shop	2	Supplies	35.96
2018-002	prairie house	2	Supplies	7
2018-002	roadhaus	2	Supplies	24.94
2018-002	Sibley SWCD	2C	Sibley SWCD	145.65
2018-003	UofM Interview	2B	U interviews	8752.13
2018-004	Invoice Correction from 2018-003	2B	U Interviews	-8752.13
2018-004	Interview Mileage PE Correction	2	U interviews	641.33
2018-004	Interview PI PE Correction	2E	U interviews	1670.8
2018-004	UofM Interview URA PE Correction	2E	U interviews	600
2018-004	UofMinterview R3 PE Correction	2E	U interviews	5340
2018-004	UofMinterview supplies PE Correction	2	U interviews	500
2018-004	Invoice Correction Queenan Invoices	3B	Queenan	-14968.8
2018-004	Invoice Correction Queenan Invoices	2B	Queenan	-3130.79
2018-004	Invoice Correction Queenan Invoices	3B	mileage	-235
2018-004	Queenan PE Correction	2	mileage	235
2018-004	Queenan PE Correction	2B	Queenan	6998.4
2018-004	Queenan PE Correction	3A	Queenan	1944
2018-004	Queenan PE Correction	3B	Queenan	7776
2018-004	Queenan PE Correction	4A	Queenan	1381.19
2018-004	Invoice Correction SWCD WC DT 34.34	2B	Sibley SWCD	-1116.05
2018-004	Sibley SWCD WCDT 34.34 PE Correction	2C	Sibley SWCD	1116.05
2018-004	Invoice Correction SWCD WT 41	2B	Sibley SWCD	-2829
2018-004	Sibley SWCD WT 41 PE Correction	2D	Sibley SWCD	2829
2018-004	UofM Survey Postage	2	postage	2450
2018-004	Uof M Survey Printing	2	printing	4550
2018-004	UofM Survey Mileage	2	mileage	920.96
2018-004	Uof M Interview Mileage	2	mileage	641.17
2018-004	UofM Supplies Interview	2	supplies	500
2018-004	Hub Publishing	2	printing	1617.68
2018-004	Hub Publishing	2	resource materials/supplies	675.32
2018-004	USPS	2	postage	647.16
2018-004	Hub Publishing	2	resource materials/supplies	1023.31
2018-004	Sibley SWCD Tech 34.34	2C	Sibley SWCD	240.38
2018-004	Sibley SWCD Tech 48.55	2C	Sibley SWCD	267.03
2018-004	UofM RA 39.54 survey	1B	U Survey	4349.4
2018-004	UofM RA 39.54 survey	1C	U Survey	1977
2018-004	UofM RA 39.54 survey	2A	U Survey	27678
2018-004	UofM RA 39.54 survey	3A	U Survey	1186.2
2018-004	UofM RA 39.54 survey	4A	U Survey	1977
2018-004	UofM UA 12 survey	1B	U Survey	480
2018-004	UofM UA 12 survey	2A	U Survey	1680
2018-004	UofM UA2 12 Interviews	2E	U interviews	600
2018-004	UofM PI 41.77 Interviews	2E	U interviews	1670.97
2018-004	UofM R3 33.375 interviews	2E	U interviews	5340

Outreach & Education Video
Project for Citizen Engagement

LOWER MINNESOTA RIVER WATERSHED

Project Input

Queenan Productions proposes to record and produce a video that speaks to priorities and paths to build effective relationships and wider awareness on how to improve the health of the watershed in the Lower Minnesota River. These relationships are to build a stronger capacity for Soil and Water experts to be a helpful resource to information, programs, trusted relationships, interests and funds available for the citizens who want to play a proactive role or learn more. In order to do this, several soil and water staff throughout the watershed in Le Sueur, and Sibley Counties have given input on what are strengths, areas of gap or need, and ways to address water quality concerns relevant to specific areas and counties within the watershed.

Project Input

Some of the messages QP has learned:

From Mike Schultz – Le Sueur SWCD – Le Center, MN

(AQ understands Mike may have photos of flooding)

They've had success and funding with the NW part and some metro areas in New Prague. The Sand Creek watershed has been the focus of ten years of work w/Scott and Rice Counties where there have been targeted watershed demo's and BMPs for landowners. Sand Creek has multiple impairments. Most of the landowners for targeting are agricultural, row crops and a few shallow lakes, only one of which has fish – Lake Pepin. They've also done some streambank work in Scott County as well as capital improvement where flooding has demolished structures, hills and scouring along bridges and grade drop-offs. They have identified bluffs that are missing large portions. They've worked heavily with Scott County's Wetland Management Area(?) ; and prior to that, 15 years ago, in Raven Creek.

*__Currently, there's an unnamed tributary in Le Sueur County in Henderson that needs support; and an area where two tribs merge into the City of Le Sueur: Forest Prairie and Le Sueur Creek. Schultz believes their asset is very good relationships with landowners. First name basis.__

Educational Priorities: Need to focus on water use (shortage of ground water; need to conserve), water quality and each person's direct relationship with the health of his or her watershed. Education is needed on:

- How cities work with water in general; wastewater treatment; how not to waste water (running long showers; flushing toilets)
- Water runs down hill and downstream; it's what a watershed is; everyone is playing a part, not just agriculture. Eventually everything ends up in the river. How does the water get to the river? Ie. From storm sewer, from the ditch… if you dump a bucket of water, some maybe goes into the ground, some to the lake, some to Mn River…
- here, we don't have the Watonwan River. We have the MN River and the rest is relatively flat.
- **Clear Lake, is a lake that is filled with algae in the middle of summer**.

- **Flooding is an issue**. **Was doing water monitoring at unnamed tributary in Henderson and before/after the flood measurements went from 6' wide channel to more than 20' wide channel.**
- Buffer Law – feels their work is successful.

How to reach the people? Where to play a video or have a booth?

Pioneer Power – **Popular, local Swap n Shop show** that is huge; particularly with agricultural population; two shows:
1) this weekend
2) **end of August**
Traders bring in their antiques, etc. to trade. Located 5 miles east of Le Sueur and 10 miles west of Montgomery; huge crowd.
Probably market there;
County Fair; where else?

Cannon River Watershed portion in Le Sueur focuses on Jefferson Lake – highest area of concern; nutrients; lakes with TMDLs.

Mike works closely with Le Sueur Environmental Services, Josh Mankowski.

Josh Mankoski – Le Sueur Environmental Services, where water plan originates for county. One of the sponsors of this grant. Planning/Zoning; tied to lakes and lake home-owners; shoreland projects; permitting; more strict ordinances in Le Sueur county than the state requires.

1. Josh says Farming is the biggest community of Le Sueur County to address in the video. He does NOT want it to be all negative. He is from a farming upbringing in New Prague where his family runs the only dairy farm in the city – grandfathered in; small head of dairy; Uncle runs it. I asked if he and his family would be profiled or a part of the interview/story – build a presence and credibility with the farming community --- not interested in doing that (camera shy? Wants positive relationships and trust and low profile?).

2. A lot of issues are because of past farm practices. The water gets to the river much faster than it used to. "We have farmers who work hard at water management – sampling their own outgoing water from their drain tile; many have had buffers for a long time." They run the gambit,

however. **A cultural problem often heard: "That's how my grampa farmed,** so that's how I do it."

- BMPs a priority.
- Showcase the positive cases in farming; they're on the defensive.
- **Locating more storage in th watershed; wetland restorations**
- **Streambank stabilization**

Josh works a lot with shorelines and lakes, and they always blame the farmer. When actually, there are many near the shoreline and lake who have failed septic systems impacting the lakes' phosphorous levels and the ground water. (Clear Lake; Pepin Lake; Clear Lake is not clear.) He wants to build trust with these farmers, so it's important not to be blaming them. That being said, he knows **agriculture run-off and nutrients are the biggest problems for these lakes (environmental/natural types).**

On Septic system projects working towards compliance and lake shoreline restorations, they've been focused on the bottom half of the Le Sueur County, many of which are earmarked for development. These are in the Middle MN and Upper Cannon.

Gap: Josh does **not have access to the landowners near the lakes in the Lower MN** as most of the lakes there are categorized as more natural/environmental vs. recreational. He explained how rec lakes have cabins around them (DNR designated) whereas natural environmental lakes have farther setbacks. The natural environmental lakes in the Lower Mn River do not have Lake Associations or other organized groups that Josh can work with to access the individual landowners. Which makes it tough/unrealistic, he says, to go 1:1 there as the area is vast and workload is busy. **Access to landowners here is a real problem – challenge**. And if lake associations exist, here, they are run by farmers? (not sure). So the **relationship between farmer-led Lake Associations or these private landowners and the County needs some help.**
How can video/outreach be a tool to help reach these landowners meaningfully? He wants more 1:! Opps to discuss how to slow the water down. And if we reach them, what do we want them to hear and see?

(We need to find them socially? Pioneer Power?) Q: What other ways?

_____

Josh wants us to put focus and the spotlight on:

Geographically: **Le Sueur Creek Area & Forest Prairie Creek**

Topics: High flow; flash problems; locating storage in the watershed;

- **Wetland restorations**
- **Storage Ponds**

He will connect us with his source at Wetland Consrvation Act. He thinks that Greg Schwartz, head or Corn and Soybean Assns could help connect me to some inspiring stories in the area with specific landowners. He's worked with Greg before to get producers for a Water Plan, which is currently being reviewed at the State.

Coleton Draeger, 507.237.4050, watershed specialist, and I also spoke at length on Wednesday, April 20, 2016.
Coleton told me that two main areas, High Island Creek watershed, and Rush River watershed, are the focus. It's all agriculture.

On High Island, there's a group who is active, Friends of High Island, who have talked about getting a bioreactor going near the lake. There's 700 acres draining into the lake there. The landowners around the lake are primarily farmers and they're proactively raising funds and organizing to get projects on the ground. Mark Dittrich of MDA may have come to speak to them. They're doing fishing contests, etc. for awareness. All of this is great, for a lake focus, but Coleton wants to focus on the entire watershed to increase awareness.

He's looking for funding options; how does EQIP help (NRCS); etc. I referenced some of the focus group write-up I did in Yellow Medicine. Curiosity Alive and Well on the Farm.

The Rush River watershed is more difficult because there are no organized groups to work with. And there's no water(shed?) district for governing. Only authority is through the county. Three branches here: North, Middle, South. All drain into final stem of Minnesota River . Some elevation changes and ecosystem issues. Some streams look like they are straightened, especially Rush River, that it looks like a ditch, so small, then opens up at MN Riv. Then stream appearance south of Henderson.

He wants to stay away from the Buffer Initiative with his outreach efforts since it's a sore point and will be enforced to happen, regardless, so he'd prefer to focus on other BMPs and incentives to get some foreward momentum.
Perhaps **cover crops**. There's a farmer, Jerry, a seed salesman, who is running some test plots on cover crops who might be good to work with and to showcase. He'll explore. But can't plant til Septemberish.

Some of the topics noted by Coleton: As the price of corn and soy goes down, and the cost of land rentals goes down, there's **more and more farmers willing to take land out of production and put it into CRP**. He said the SWCDs and FSAs are swamped right now with CRP work. That's a good story to tell, perhaps? He explained basic numbers, and they are more close in numbers now, vs. highly different (keeping land in production vs. CRP).

Coleton wants to confer with his SWCD colleagues to see about possible spotlighting some landowners who have an inspirational story – or even possibly getting a group of folks together to have **a dialogue about all of the changes they've seen on the land over the years**. Have Bryan S. attend. And record that, as part of the story for outreach and education.

He would like to find ways to reach into the communities in Henderson or along the Rush River. I told him about Art & Barb Straub and colleagues with Henderson's Hummingbird Festival. And the interpretive or Environmental Center, there, and Charlie Blair of USFW and Friends of the Minnesota Valley, as well as MN River Congress. How can these folks help reach out to the people like Coleton and the SWCDs working with landowners to put real projects on the ground?

Coleton feels that a real-life video will be good, but in order to be able to make it more accessible and easily distributable, instead of posting it, or in addition to posting it on the internet, he'd like **DVD copies, perhaps 250** of them, to pass out at local events – not just county fairs, but other community gatherings as well. The older farmers don't know about some of these new conservation drainage practices. They don't use the internet. They do listen to KJUJ out of New Ulm, for rado. And KEYC, out of Mankato for local television.

For better understanding of eastern

And, I also spoke with Ron Otto, a week ago, SWCD of Sibley County, who had several considerations to put on the table.

Ron says, "they don't want to hear the truth,". He points to a big difference between rural and urban in this watershed, namely, the urban parts have much more money to deal with than the agricultural and rural areas of the watershed.

(More on notes from Ron to come.)

Ron said that often when the rains come more heavily, it's necessary to slow the water down. But in the western parts, the mentality is to get rid of the water faster. Where's the balance? The east and west parts of the watershed could probably use different focus when it comes to BMPs. In the west, more appropritate to look at buffering ditches and cover crops. In the east, more focus on structure-type of BMPs, like sediment basins or drop-structures. The eastern rural side of the county is hilly; a lot of ravines. Different considerations.

"A watershed doesn't stop at the county line." New WRAPS approach. Will have more info by this summer and into the fall. Legislature working on it.

On the buffers: Many folks don't understand why we need to put them in place. Doesn't quite agree with one size fits all approach – it changes depending on the land.

Towns in his watershed focus: Arlington-Winthrop-Gibbon; Green Isle; Gaylord is county seat; Henderson; New Auburn.

How does Ron try to get the word out? Some are presentations to public about water quality problem – trying to get them to understand what they are and how to go about addressing them; some are 1:1's.

Jon Lore – DNR

Re: Stories, Studies or Work on the High Island Creek:

Hi Anne,

High Island Creek is near and dear to me as it was the main watershed for my thesis, and we have surveyed the watershed as part of our job in recent years. My thesis mainly discussed the impact that the dam had on fish communities. Out of 42 fish species sampled, only 15 were found upstream of the dam. In 2014, there was a record flood event that wiped out the dam, and since then MPCA and DNR have documented 18 new species upstream of the dam. Eight species have moved as far as 26 miles upstream in one year!

The 2014 flood resulted in the dam being removed and I know of one bridge that collapsed on Rush River, otherwise I know of a house in Henderson that was damaged by a landslide, but that was not near a river.

For more information, you can read my article in the Conservation Volunteer that discusses land use changes and climate changes that resulted in the flooding. If you have any more questions, feel free to call me (507)389-8804. We should be in most of the week because of the weather.

http://www.dnr.state.mn.us/mcvmagazine/issues/2016/jan-feb/southern-Minnesota-rivers.html

Jon

Ron Otto Interview
Sibley County SWCD – Met in Henderson, MN
May 3, 2017

AQ: If you don't mind, I just want to record what I learn from you because I'll probably try to transcribe it and make some sense out of it myself and then if it makes sense to include some of your comments, I will. They want me to do a report as part of what I'm doing. So if that's okay with you.

RO: That's fine.

AQ: So where on the internet is your favorite, good, effective map of Sibley County.

RO: Probably just Google it, the maps I use I've got on my desktop and I don't really know where they're from anymore. They're just there.

4:41.8
Q: Okay, so **eastside, west side of the river,** when you guys talk about that, is that within Sibley County or within the watershed?

RO: Well we do everything west of the river for Sibley County.

RO: We go a little ways west of ???

AQ: To Morton?

RO: No.

AQ: So you work on the western end, which means your focus is more on what kinds of issues versus the eastern.

RO: Right.

AQ: You've delineated that before but can you educate me?

RO: I guess the easiest way to say it is the **people on the west end want to get rid of their water and the people on the east end want to slow it down and get less water.** That's the simple answer. **Whenever we have heavy rains, people on the east side of the town here coming in we've got to slow this stuff down and the next one that comes in from the west side, I've got to get rid of it faster.**

AQ: But do you deal with people on the east side?

RO: Oh yeah, from Henderson.

AQ: Okay, so you're talking about east side of the…

RO: Of the county. And basically what I'm talking about east side is **from Arlington east to the river, that's where the big change in elevation is.**

7:01.5

AQ: Can you show me?

RO: Well basically from about here down to the river, that's where your big change in elevation comes in as far as…

AQ: From like Arlington?

RO: From Arlington, Green Isle, then to…

AQ: Cologne.

RO: Oh we don't go that far north either, but we go up about **halfway between Green Isle and Hamburg is where our county ends. But from there, where you start moving toward the east, that's where our elevations really take a dramatic change. And that's where the people start complaining. They get the big changes in elevation, water moves faster. When you get farther away from that, they just want to get rid of their water.**

AQ: Can I just back it up and ask you, what is the health of the watershed in this part?

8:12.4

RO: **It's not good all the way through the watershed. We've got a lot of sediment issues all the way through. As you get east, we've got down-cutting and we need storage out in the western part for the county, western part of the watershed and it doesn't seem like that's happening very easy**. It's not happening like we like to see it. **They all want to farm it and there's some areas that shouldn't be farmed and they just want to tile it and farm it.** And then that's a **big issue.**

AQ: What is the **most hopeful thing** that's going on right now? How long have you been doing this?

RO: Ten years.

AQ: So in ten years, what are you most proud of? When you think back at all the work that you've done throughout ten years, and I'm sure there's a ton of it, what are some of the things that come to your mind as rewarding and feeling like okay, that was good work?

9:36.8

RO: **Just trying to change your perception, that's the biggest problem of this whole, of what we have to do to improve water quality**. That's our biggest problem right now is trying to change the farmers' perception. I think it's changing slowly.

AQ: From what to what for example?

RO: Well I believe the farmer was always concerned about **water quality**, but I think **the younger farmer is more concerned about it now than probably a couple generations ago.**

AQ: Because that's a cultural thing?

10:17.4

RO: I think yeah, I believe it's more of a **cultural** thing, and **it's always hard to change old habits,** where the younger generation has grown up with **this water quality thing being pounded into them day in and day out, where the older generation, it wasn't so much.** So the younger generation hears it every day where the older generation maybe didn't. So I think that makes sense.

AQ: Where do they hear it do you think? The younger generation hears it from what source whereas the older generation hears it from wherever. So when you say that I think about trying to remember the name of the gentleman I interviewed, he was with the Farmer's Union and he was in his late 70's or early 80's, and he was saying that when he was raising his farm and getting it going, every acre needed to be productive and they were encouraging that at the time, fence row to fence row.

11:36.2

RO: Right, and it's gotten to be true where **it's a corn soybean rotation where there was more crop diversity years ago, where they all had a little bit of corn, a little bit of oats, fall crops. They had more diversity as far as livestock where very few farmers have livestock anymore.** That all made a difference.

AQ: When was that?

RO: It's been changing over the decades. **It's getting more to less and less livestock every year the way it seems. I can remember when I was younger, the milkman stopped at every farm along the way and now from Gaynor to Henderson I don't think there's a dairy producer along the highway anymore; they're all gone.**

AQ: Because why?

RO: Economics is one thing.

AQ: Because it's more profitable to do corn and soy?

13:00.0

RO: Right, **it's mostly economics I think.**

AQ: But it used to be dairy? Because dairy is bigger, not quite as big as in Lanesboro where I live.

RO: There's certain areas where there's a lot of dairy yet. I know in the township that I live in, we have **three dairies left in our township** and one of them is thinking about quitting by fall and the other one, he probably doesn't milk more than 20 cows and the other one's a thousand-cow dairy, so that one will probably never quit.

AQ: So **the bigger the more security**?

RO: Yeah.

13:44.7

AQ: Did you used to do a dairy farm? Can you tell me about your farm? Or tell me a little bit about the history or your own story on the land.

RO: My grandpa had, it was my grandpa's farm, but I didn't have enough land that I felt I could keep on.

AQ: How many acres?

RO: 160 and I rented some land and I just didn't feel that it was economical to try and keep on. If I wanted to keep on, **I had a farm and I had to work besides that. It's not economical. I was working day and night;** I wasn't about to do that anymore.

AQ: So you decided to…

RO: **Quit farming and work one job**.

14:41.2

AQ: And do you rent your land?

RO: My **nephew runs it** now. And I only owned 40 acres out of it, the rest of it I rented from my dad or other relatives.

AQ: And how has that changed over the years? When your grandpa ran it what was there and what is there now?

RO: Well my grandpa ran it and then my dad bought it from my grandpa.

AQ: Did it go from dairy to, or diverse…

15:15:18.3

RO: **Pretty diverse to, dad had dairy and then I took over the dairy from him and then the equipment wore out, what do you do? I couldn't afford to stick a lot into it, because I wasn't going to stick a lot into it if I didn't have somebody that was going to, if my kids weren't going to help me. My oldest son wasn't interested in dairy and my youngest one was too young to make a decision.**

AQ: So did your oldest son stick around or did he move to cities?

RO: No, he lives around here and helps the farmer out. My youngest son, he helps his father-in-law on the farm but works in the city.

AQ: So your nephew runs most of the land?

RO: Yes.

AQ: And is he doing corn and soy?

RO: Yes.

16:48.0

AQ: And he's the one who takes the house from your son?

RO: No.

AQ: So you've pretty much lived most of your life here?

RO: Yes.

AQ: Okay, that's a lot of history. So along those years, **what are some of the things that you remember were really good, strong, proud connections to the land and to the water before you joined Sibley County and then since then?**

18:20.8

RO: Well the one thing is **one with trust**. **It takes a lot for the farmers to come in and trust us, and that's one thing I think we're doing okay in, you sometimes wonder.**

AQ: Does it help that you were raised here and that you know everyone?

RO: I think it helps sometimes.

AQ: What would be a way it would help and what would be a way…

RO: I think they understand the problems, **I think I have a better understanding of the problems once in a while than some other people do that haven't been around.**

AQ: Do they let you come and walk the land?

19:50.4

RO: I've never had a problem with going out and talking with anybody, going out and looking at their farms and stuff; I've never had anybody deny me to do that. I just don't see it if they're asking us to, if they feel they have a problem, they want us out there to do something. If they want help for something, they're going to let us come out and take a look.

AQ: So for you, what's the perfect, but along those lines; how does that work well for you? What's a good case or what's a good example of how someone needs some help, do they come into your office or do they call you?

21:05.0

RO: They come in and talk. When I get down here I don't always understand everything, but I think a lot of time I understand their problems because I've probably been through it in some form or another over time, whereas somebody that's never farm the land maybe doesn't have quite, doesn't always understand it all.

AQ: When you're talking and developing trust, do you talk economics, like to get the most efficient use of their resources and their money and their investment?

RO: Oh yeah.

21:59.8

AQ: Do they ask you to run numbers, that kind of thing?

RO: They always want to do it as economical as possible.

AQ: And they're looking for you to help too, right?

RO: Right, right.

AQ: So you have to explain the cost share.

RO: And yet, you want a job that when it's done that it's not going to fail on them right away. You want something that's going to last.

22:43.7

AQ: And why is that a and yet? Because it costs money and you have to target the most effective use of? I don't want to put words in your mouth.

RO: The most effective use of the money but it costs a lot of money to go back and fix this stuff too if it isn't done right.

AQ: Can you share something with me along those lines, where you didn't have to come back and fix and it did give them what they were looking for?

RO: That's usually what happens. Every once in a while something, it isn't engineered right or something and we do have to go back and fix, but not very often.

AQ: What is an example of something that is usual like that? What would be a typical?

24:14.8

RO: Probably our most common structure is a water sediment control basin to stop the…

AQ: With a control stricture?

RO: It stops the erosion and yet allows them to farm their land without too many problems. Most of them are built that they can farm right over them and yet it'll hold the water there for 48 hours or less.

AQ: How do they work?

RO: it's like a dam built up at the end or terrace, is what it looks like. It's got a tile behind it, but it gauges how fast the water can leave and it's usually built on a slope so when the water can't run down the slope anymore and cause the erosion.

AQ: So this is the slope, it's at the bottom?

RO: No, it's usually up higher and it's a long slope you might end up putting one or two of them in there so if the water starts moving too fast again, then you put another one in.

25:38.3

AQ: You have much more flat land here. In Lanesboro we have a lot of slopes so they do contour strips.

RO: We don't see much of that around here. **We see some grass waterways, but not a lot of those either.**

RO: We've got a few in the county, but not a whole lot. That you can tell too, **we're much flatter**.

AQ: **Will that change with the new buffer regulations**?

RO: **I don't think so,** I don't think that'll change a lot with the buffer. Because really **the buffer is pretty much along the ditches, is all the buffer is for, buffer law**.

AQ: And the waterways are…

RO: Out in the fields.

26:42.5

AQ: Wasn't that one of the changes they made? First they were saying it was all water and then they said just ditches, nothing on the private land.

RO: Well at first they were talking private ditches and they took that out. So **there's public waters, there's public ditches and there's private ditches. And at this point they've taken private ditches out** but I'm really thinking down the road.

AQ: **What's the difference between a public and a private ditch?**

RO: Not a whole lot. **They can be watered the same way. Other than that, a public ditch is built with, the county takes care of it, a private ditch is taken care of by private landowners in the area of that watershed.** So that's the big difference.

27:58.3

AQ: But they could be the same…

RO: They hook into one another.

AQ: And they could be on the perimeter? You know how you see them just along the roads.

RO: **Private ditches are usually up on the upper ends of public ditches, or hook into public ditches.**

AQ: So how do you delineate them? **How do you say here's where the public starts and the private starts? What's the criteria?**

RO: Well, the **people on the private ditch still have to pay a fee because their water is still going through a public ditch. But what happened is, the public ditch is built from here to here and then after a while, these guys didn't want to be part of the public ditch, so they just dug their**

29:09.0

own ditch on and paid a fee to drain their water into the public ditch. They just dug their own ditch, so that's how that all kind of worked.

AQ: So you were saying that, when I asked you how is the health of the watershed, **you were saying that sedimentation is an issue and the source of that is multiple?**

RO: There's **multiple reasons** for that. We have **problems with phosphorous, nitrogen.**

AQ: **How is the idea of spring applications of nitrogen going here for fertilizing?**

RO: I think it's **changing some**, still a lot of problems with applying nitrogen, but I think the thought process on that is changing some. I think split application, we're seeing more farmers doing that.

AQ: Some in the spring, some in the fall.

31:04.5

RO: Some in the spring and a little more in summer. I think they're finding that they might have to let the rain get a little bump by doing it that way. They can get by with a little bit less nitrogen by doing it that way.

AQ: **What do you think helps in that decision-making process?** I worked with some farmers who have said they know, for example, there's a group in Illinois, I think it's called the East Indian Creek. The person who was in your position knew, just like you, a lot of the people. He knew kind of the middle-sized, knew the people that would be super "I'll try anything first" and the others that are more cautious and conservative and maybe smaller-sized but maybe not super small.
He picked three or four and he did start a split application program. And the reason I'm bringing this story up is it was an example of, the three or four that he picked and it ended up being four or five in the group, they trusted and also respected the others. They knew the other one, they knew enough about the other farmer to follow the well if he's doing it, maybe there's something there and willing to try and also willing to put a little bit of risk too. And I guess the risk is that you don't get the full productive ???or that's the perception. And so they put grids on in their own land, plots I guess. is that common here?

33:44.1

RO: Well there's **a few farmers** around that have small plots that can try different things like that and I'm sure that it's getting out to other ones here. **They're talking about what they're doing and is it catching on, I don't know. That's the hard part is getting the rest of them to follow you.**

AQ: Do you feel like you would prefer that it's farmer-led versus imposed upon.

RO: Yeah, if you could get them to do that on their own rather than a government regulation is by far the best way to go about it because as soon as you have a regulation that says you've got to do it this way, you know there's going to be kickback. They aren't going to want to do it, that's the way I see it anyway.

35:03.8

AQ: So I'm sure there's a lot of issues and there's a lot of challenges, do you want to talk about that a little bit or do you want to talk about the story that you're really proud of?

RO: I think we should probably talk about **the changing issues**. New perception and all that, cover crops. **That's a big thing right now is talking about cover crops.**

AQ: And what are the **perceptions?**

RO: Well right now, when it's cover crops they're talking about, keeping that ground covered all year long and **we've got a couple farmers in the county that are trying different things. I don't know, we have to see how it works.** It looks awful exciting with what they're doing, but it's really **in its infancy around here** yet. **The perception around here is you have black dirt, this is going to warm up if we don't have it exposed and with cover crop how do you get it exposed unless it's black? I think it's going to be a long hard journey here.**

36:33.8

AQ: So they rather see the open black dirt versus, because of temperature?

RO: Yeah, I don't know. **I agree with them somewhat.** Looking at some of these fields, some of the cover crop stuff that I've been to, I don't know. I might be wrong.

AQ: What are your concerns or thoughts or considerations about that?

RO: Well a year like this, we just haven't had any warm weather to warm the ground this year. That's one big concern. **Very little corn planted yet this year and it's the 3rd of May now. and most of the time by now a lot of the beans have been planted. Anyway in the last five, six years, the average most guys were done with their beans by this time, so that's a big setback.**

37:54.0

AQ: So **you think that cover crops are not going to be well received because the temperature of the earth is too cold?**

RO: I just don't think the ground, I don't think it's going to warm up like it does a lot of time. And this year would really be a setback if we had a lot of cover crops.

AQ: Did you help put some cover crops in?

38:21.5

RO: Yeah, we had a program that **Rush River and the High Island Watershed last year,** we had five, **600 acres,** but we had cover crops, I can't remember now exactly how many acres it was. It was a number of acres that we had last year.

AQ: They were planted last year?

RO: Yeah, and they had to keep cover through the winter. And we went out, and we'd never done this before, but **we went out over winter and looked at it because there wasn't a lot of snow in the winter and there was varying degrees of cover over winter on all the fields. Some of them had real good cover, some didn't.**

39:14.7

AQ: And they probably all had the equal application of the seed?

RO: They pretty much were all planted the same way.

AQ: **How were they planted?**

RO: Most of them you just **use a fertilizer spread and blew it on**, but there was **different planting dates too, so that made a difference.** Some of them were planted real late compared to others.

AQ: Who was it that you worked with there? Was this a private farmer or landowner?

RO: It was nine different farmers from about three miles east of Gainer all the way up to Stewart, we had them scattered those eight farmers.

40:20.4
AQ: Were they kind of in a row?

RO: No just scattered around.

AQ: **Did you pick them or did they find you?**

RO: No, **they learned about the program and would come in and wanted to try it. And I know we had a program here, five, six years ago, and at that time we had about 3,000 acres in the program before our grants ran out. But I don't think any of those farmers came back this time to sign up for it.** But either they didn't see it.

RO: Well we're in the first year of it and I know we've got one farmer signed up for next year because he liked what he saw. We're trying to get that out there, this cover over ground in the winter to stop the blowing.

AQ: What would help with that? What would help you with that?

41:44.5
RO: I don't know

AQ: Is the one that you guys used, I think it varies, is the one that you're using three years.

RO: Yeah.

AQ: Because some places just do it one year. This is NRCS?

42:07.6
RO: No, this is a Clean Water Grant or a 319 Grant. It'd be kind of interesting to go back and talk to these farmers from five years ago ???. Or did they do it because they could get X amount of dollars just to do it.

AQ: It would be interesting, can you take me by there?

RO: They're 15 miles away.

AQ: Well you can tell me where they live and then I can go.

AQ: So is that one that you were involved in, that you actually helped get the grant?

RO: I can't remember now if that's one, I think that was written before Colton started.

43:49.5
AQ: Who communicates with whom now? Is there follow-up or how does that work?

RO: Coulton's the main person on that one now.

AQ: Can you tell him that we talked about it and you recommended I...

RO: On that one there, if you'd want to look at one of those, and I don't know if the guy's planted corn already or not, that's the only thing. I'd hate to send you on a wild goose chase now it's all planted already, worked up and planted.

AQ: That's okay, I'm looking for people.

RO: I don't know if he'd talk to you or not either.

AQ: So why would he not talk to me?

44:40.6

RO: I don't know if he would or not.

AQ: Can we try?

RO: We can try.

AQ: I can try and keep the heat off you then. I'd be happy to reach out and not put you in the middle, but I would need his main number. Where do you want to look today?

45:07.7

RO: I've got a place here right outside of town we could probably look at. **It's the Rush River. One of the flooding events that we had in the past cut into the county park really bad, probably 50 feet and then you start that with the restoration on it. It actually went across the county park and probably deposited two or three feet of sediment in the park. So instead of removing a lot of the sediment, they just seeded grass over the top of it and then restored the river kind of back to where it was.**

AQ: And that's land that's owned by the county park?

RO: Yeah, I can show you that.

46:00.7

AQ: Can you show me some agricultural related?

RO: I hope I can find some that we can see from the road. I don't know if I want to get too far off the road with **all the rain we've had this last week.**

AQ: The reason I'm asking is need to represent both agriculture as well as other urban issues and I need to balance that. and I'm definitely going into the flooding with Henderson.

RO: Yeah, I don't know why Mike wants to come over here and do the flooding because he's in Le Sueur County. I don't quite understand that.

47:07.7

AQ: Well I'm going to see if he'll give me some agricultural, but he did recommend that I talk to someone at the Ney Nature Center about the flooding. So I don't need to do the flooding with him, but he was just saying that that's a topic, I think that's what he meant. And then he wants me to talk to this farmer in New Prague. I know he lives in Henderson, but we'll keep it to Le Sueur. Is there tension between those two counties, a little bit?

RO: I don't think so. We don't work a lot with Le Sueur I know.

AQ: And why?

RO: Well **the soil is really different between the two counties and it's a lot sandier over there so what we do is completely different, so I think that's some of the big things.**

48:17.6

AQ: Do they have more of the decline there on the receiving end in terms of…?

RO: They've got more lakes for one thing. Sibley County, all their water runs towards the Minnesota pretty much. We've got a little bit that runs north, but pretty much all our water runs to the Minnesota here. A lot of their water runs to the Mississippi and all goes to the east.

AQ: So the watershed itself, most of yours goes, because Sibley is a big county when it comes to direct Minnesota River access and drainage. So what is the Minnesota River, what is the health of the Minnesota River in this area?

RO: It's impaired.

AQ: And has it gotten worse?

49:50.6

RO: I don't know if it's gotten a lot worse, but I don't think it's gotten any better.

AQ: What are the main factors that go into that?

RO: I think it's the same thing, **it's your sediment, your phosphorous, your nitrogen. I think that's the main problem.**

AQ: How many people in Sibley County of the landowners that are managing farmland are, would you say there's different age categories? What percentage is kind of that generational, cultural thinking we were talking about? Just to get a general picture. Half and half or 75/25?

RO: I don't know what to say as far as percentages. **It's an older population, more older farmers than what they are younger, definitely.**

AQ: Are most of them living on the land or absentee landowners?

51:16.1

RO: Boy that's a tough one, I really wouldn't know what to say to that.

AQ: Does somebody track that?

RO: I'm sure there is, but I wouldn't know where to look for it. I don't know what isn't tracked nowadays.

AQ: So **in terms of changing perceptions then, what do you think is the best way to go forward?** Because that's what I'm hearing you say is that that's the biggest obstacle.

RO: Well we've just got to **keep educating, keep talking** about it. The more you can talk about, you keep changing their minds slowly but surely, that's the way I look at it.

AQ: **What works for you to get that kind of conversation going? Would you prefer it one to one or in a group?**

52:14.6

RO: It works **both ways.** For some people it works better one to one, other people pick it up okay in groups. You've got people that'll sit back, it seems like they're not participating, but they're soaking in every little thing that's being said. I've noticed over the years, you keep talking about it and all at once some day they come in, "I heard this sometime back, I need to know a little bit more about it." It seems slow, but all at once, yeah, they're coming onboard. I've noticed that many times and I'm a true believer in you got to keep educating. I try to go as many educational things I can about this stuff because you've got to keep up on it.

AQ: You yourself. There's a lot of changes going on.

RO: If you don't keep up on that stuff, you can't keep pushing it out to people.

AQ: But then do you call people, **how do you initiate a working relationship**?

54:00.9

RO: Well most of the time it's just **by what comes in the office**. Unless we have something really new, then **once in a while we'll have a meeting** or something, or get together, **invite people to a meeting if it's something really new and we want to get the word out.** They'll have some type of meeting or something. Otherwise it's just by **word of mouth and brochures** and then when they come in, they'll want to ask questions.

AQ: Do you guys do field days?

RO: Every once in a while, not too often. Last year for instance, **when this whole buffer thing was coming out, we had three different meetings where we went to three different places in the county and explained this all to the farmers and talked to them about it and what was happening**. That time we did do some meetings. We had **another one this spring**, trying to get them up to speed. **It's been a hard one, the legislature doesn't tell us what to do.**

AQ: Yeah, so **what's happening there?**

55:20.2

RO: I don't know, we don't know yet today. **Until the legislatures over we won't know.**

AQ: What do you know? It is law.

RO: It is law and there's been some amendments to the law brought in, but **what's been passed and hasn't been passed, I don't know**. There was some talk about pushing some of the stuff back a year. There's been some talk about throwing it out completely, but **until the legislature's over, we don't know for sure what's going to happen, so we can't tell anybody what to expect.**

AQ: When is the legislature over?

RO: End of this month, or sometime this month. I think they said something about 20 days this morning.

56:32.5

AQ: One of the things that I was hearing is that they're trying to get, there's changing dynamics between county versus maybe having it by the State BWSR.

RO: Yeah and we don't know where we're at with that.

AQ: What would be most helpful for you?

RO: Just **getting through the legislative session so we know where we are**.

AQ: Do you feel like, "I don't know what to say to my people."

RO: Yeah, people are coming in every day and **we just don't know what to say to them. so when the legislature ends, we'll have definitive answers that we can say, "Yeah, this is what's going to happen from now on." Right now it's all ifs.**

57:24.3

AQ: Do you get a feeling that when people ask you about that, that they want certain things over other things?

RO: **They just want answers.**

AQ: They want to know what they're dealing with.

RO: Right, and I don't know if they like the answers or not, the way it's going to be, but they want answers too because **some of this stuff has to be taken care of now, so if things don't change they'll be compliant in November. And we can't give them answers.**

AQ: November of?

RO: This year, some of that, and some of that, because of that we can't give them answers at this point.

AQ: Also, don't they have to know because corn has to be in by May 15th is what Coulton was saying? So they have to know how much…

RO: How close, **can they plant up to the ditch this year or not?**

AQ: Generally do you have to say, "No, you can't."

RO: Well **it's up to them**; they **take a chance** on it. **If we have a good growing season, they can possibly get the corn out in time to do something because it has to be seed in the ground, it doesn't mean it has to be growing, just seed in the ground.** But then we have to go out there, **how do we know if it's been planted or not? And go out there and see if there's been grass seeded on November 1st, that's going to be pretty tough, to find grass seed. That's really fine seed.**

59:02.0

AQ: Are you in the position then where you have to go out and see that?

RO: **We're compliance and that's our job and if we feel we're not compliant then we're supposed to send it on to either the county or BWSR for enforcement.** If we feel they're not in compliance, they're the ones that have to do the enforcement is the way I understand the law.

AQ: So you're in the position where you're, **is that kind of a conflict of interest for you, the two hats you have to wear?** And the reason why I'm asking that is, when I was talking to Amy, she was saying that she's a water planner and so she's definitely more of the enforcer. So she doesn't like to be put in the position where she's walking fields, because then you really do end the trust issue. So you have to wear that hat too. What's the difference between a water planner and what you do then?

RO: I don't know, I'm a water planner too. **I'm a water planner but I work in Soil and Water. She's a water planner and she works in the county.**

1:00:29.7

AQ: And what is **the difference?**

RO: It's just **how the county works.** Some of them take that position and give it to Soil and Water to do the work and some of them leave it with the county to do the work.

AQ: So when you say Soil and Water, BWSR?

RO: No, Soil and Water Conservation takes care of it. **The county gives the Soil and Water Conservation District money to take care of the water planning ??? Every county is different how that works.**

AQ: So **is it different in every county how much they give for that?**

RO: **Yes.**

1:01:09.7

AQ: And that's a county decision?

RO: Well the state kind of tells you how much you've got to give for that position. The state gives so much money for the water planner position, but then they also tell the county, "You've got to give this much money to the Soil and Water District to perform those duties." **So it's really hard to explain how it all works.**

AQ: But where do you get the variability then from county to county if the state is saying you've got to put X amount for that?

RO: Sibley County used to do it and then they gave it to the Soil and Water District. After the district had it about two years, the state cut the funding in half. So now at that point it was a full-time position and at that point it got to be a half-time position and the county didn't want to give any more money for that position so then it went to a half-time.

AQ: Your position?

RO: Yeah.

AQ: When was that?

RO: Fifteen years ago maybe, 20 years ago, I forget when it was. So things like that happen too.

1:02:52.0

AQ: But you're full time now?

RO: I was full time right away when I started.

AQ: But it was only a half position then.

RO: It was a half-time position, but then I had other duties. My position, when I was hired was water planner and watershed coordinator. Coulton's position. But then they decided they needed more of a position as a watershed coordinator so they hired a watershed coordinator and made my position half-time water planner and half-time watershed technician.

1:03:41.1

AQ: So that changes how much you can get out into the field. So when you're doing water planning, how would you describe what you're doing?

RO: Well water planning has a work plan that we work off every year. A lot of my stuff is to help the watershed coordinator, help Soil and Water with all the work they do, and there's other things ???, there's aquatic evasive stuff, that's part of my duties, to help with that. I have to work with the Crow Watershed, which is in the northern part of our county, that's the watershed that's up to the north of us. I work with that one. We have the Middle Minnesota River Watershed, which we have about 16 sections of the west end of our county, so I help with that, all little pieces of the puzzle that's all under the water planner.

AQ: Do you ever feel like it's too much?

RO: Some days, and the next day you don't know what to do with yourself. It all seems to come in piles and now three years ago our technician quit so now I take care of the wetland stuff too.

AQ: So what is the **most commonly implemented BMP** that is…Sediment Basin?

RO: **Sediment Basin** probably.

Willis Anthony Interview
St. Peter, MN Farmer – Crops, Hogs, FuelShed…
(Referred by Amy Linnerooth, Nicollet County)
June 19, 2017
Zoom 014

WA: Good morning to you.

AQ: Good morning and thank you for taking the time to speak with me. I wonder if I could just introduce myself and tell you what I'm up to and then engage in a conversation with you. I've been, over the course of the last few years, trying to tell the story from many perspectives of healthy land use and healthy water quality and how we can perhaps collaborate and cooperate and work together towards profitable businesses in urban as well as agricultural areas and yet innovate and be smart to protect our waters. My forte is writing and doing documentary reality types of stories and ones that hopefully catalyze and inspire versus any other impact. And so on this one, I worked on the advisory steering team initially in the Le Sueur River Watershed area to help get a group going there. I've worked with the MPCA, I've gotten funding from the Clean Water Land &Legacy Amendment Arts and

Cultural Heritage Fund to do a blog called "Voices of the River," which interviewed all kinds of people involved along the Minnesota River. I worked with a group in Lake Pepin and just finished doing some stories with a group called Fishers and Farmers Partnership, which is a network of scientists and farmers focusing primarily on agricultural watersheds in the Upper Mississippi River Basin.

On this particular project, I'm working in the Lower Minnesota River Watershed and I've been subcontracted through Sibley and Le Sueur Counties. **Through them what I've been asked to do is some engagement and video work listening on a one-to-one basis with professionals and landowners and local citizens to understand and find common values and building blocks and reach out to different soil and water watershed experts in the Lower Minnesota River Watershed** and kind of play the role of storyteller, video producer - and have a dialogue with some of the key leaders in the watershed to try to get an understanding of various people's understandings, wishes, wants, what they're proud of, what they'd like to know more about, trusted relationships, things that work, things
that don't, that kind of thing. So Amy Linnerooth had given me your name as a gentleman who has been very involved in farming and in agriculture and in kind of big picture stuff too.

I wondered if you could **tell me a little bit more about yourself,** so I can understand what **your history** is - and then if you can keep in mind that I'd like to know a little bit about **your impression of what is needed in the watershed where you live.**

WA: Aiming to be very brief, my involvement with water and drainage goes back to this, that the **farm in which we live** is **Lake Prairie Township, which says a lot in terms of the way in which drainage was fundamentally important for the kind of agriculture that we now have in food production**. With **respect to the water issues, I was involved with** something called the **Minnesota River Ag Team,** which my recollection was appointed, well I think it was initially to

be appointed by the governor back in the, (well I'd have to go back in my file to get the date on it), but in probably the early 90's and then my recollection is that the legislature also stepped in and they had a hand in having this, having the appointment, so I was on that panel and then served as chairman for a while.

AQ: Could you tell me the name of that panel again?

WA: The name they were going by was the **Minnesota River Agricultural Team and it included people from the Metropolitan Council who were involved in water treatment issues, it included people from both BWSR and DNR and MPCA** and then there were, my recollection is, (and I'd have to go back to look at the list,) it was time ago, and included some **agricultural producers** as well. And **its purpose** was to come up with **some perspectives and hopefully some policy ideas that would be helpful in meeting with at that time was a commitment from the State of Minnesota, with the federal EPA to reduce the level of pollutants**. And I think **particularly turbidity where the Minnesota River entered the Mississippi.** So that was that background.
And I also, **more recently**, served on something that I think was called **a task force,** but was put together under a legislative initiative for the purpose of putting together what was referred to as **a template for water planning in the State of Minnesota**. And that was chaired, well it was really operated by **someone from the Water Resources Center at the University of Minnesota**. (Her name was, I'd have to go back and look at the record to be sure). Okay, so there's those two times of activities of, for a time **I was on the Nicollet County Water Planning Task Force**, that was called a task force as I recall. And then more recently, I have been **on a panel that was put together really by one of the faculty members in the Department of Soils and Water Climate at the University of Minnesota along the Seven Mile Creek** which you maybe never heard of.

AQ: Oh yeah, I've heard great things about it.

WA: But its name, the name of the panel was to **develop ways of introducing viable alternative crops in areas that were susceptible to being operated essentially that they impacted water quality.** Okay so that's sort of the scenario of the way in which I've been involved in some of those kinds of activities.

AQ: May I ask you about the one at the Seven Mile Creek, the alternative crop? Is that the **Fuel Shed group** that Amy was telling me about?

WA: Yeah, it is.

AQ: And are you actively involved in that right now?

WA: Well the last meeting that was scheduled, which was a few months ago, was cancelled and I'm not sure whether it is currently viable. The key organizers may or may not have concluded that they weren't getting anywhere, I'm not sure. So I'm not sure if that's an active entity.

AQ: And may I just ask, is that the group, when you talk about alternative crops, were they talking about - which were some of those crops? Were they **trying to find ways to use corn stover in biofuel and that kind of thing?**

WA: **Yes, for fuel, for feedstuff, for ruminant animals, some processing, research activity by engineers at the Michigan State University** was headed in the direction of developing, processing ideas in technology that could produce something that could either be fuel or (ruminant animals/feed stuff)???

AQ: Okay, and thank you for this overview, it really helps me. I wish I had a lot of background on you. I did Google you and tried to find what I could, but I really appreciate you telling me exactly how deeply you've been involved.

WA: What shows up on Google?

AQ: Not enough, none of this. So I want you to say what you want and then I'm going to ask a few personal questions. So **your history on the farm**, can you tell me about that?

WA: **My family and I live on the farm where I grew up** and I was away from the farm for several years and wound up being **on the faculty of the University of Minnesota in Economics. I resigned in the winter of '81 and then became a full time farmer** on the premises where we are now. So the farm consists of **fundamentally growing crops** and then there's a sort of business entity we are doing a **hog enterprise**, so **we're doing both livestock and crop production**. And some recreational cattle, because we like to have them around.

WA: So that's what we're up to on the farm itself.

AQ: How big are all aspects of those parts of agriculture on your farm? Big or small, diverse or whatever, how many hogs, what's a good way to describe that?

WA: **We feed hogs, we have a farm ownership shares in what's called a sow farm, which produces the little pigs. We get them and then feed them until they're market weight**. And actually we began that enterprise in the early 1990's because **we thought, at least conceptually, it made good sense to be recirculating or recycling as much of the nutrients produced by animals back into plowing for fertilizing and organic matter. That was a concept that we were working with and which I think continues to make good success.** That was the conceptual basis that we had in mind when we started feeding hogs. And so we put that together as something of a separate business enterprise, business unit from the farm, it's strictly corn and soybeans.

AQ:

And before we go any further, I just want to make sure I heard you correctly. So you were saying you get the hogs when they're little pigs, you feed them until they're market weight, and this began in the early 1990's and you thought you would make this a separate business and conceptually it was based on the idea of recycling the nutrients of the manure, etc., into the soil for organic manner?

WA: Correct.

AQ: So did that mean that you were selling the manure as a product?

WA: No, it meant that we were **applying the manure to our fields.**

AQ: Alright, and then that was the conceptual basis, that's what you're talking about.

WA: And with the last two years, we've become convinced that **it'd be valuable to have more crops, a great variety of crops on crop rotation** so that we bgan working with, really from our point of view experimentally, relatively smaller increases of wheat, rye, and then planting cover crops with believe it or not, small grains and soybeans as well in order to do two things, **enhance soil structure and also keep cover on the soil during the winter when the crops are not growing**. **The concern with the possibility of some wind erosion in open winter and also with respect to runoff.**

AQ: So to protect from wind erosion and runoff. And how many acres were you experimenting with? I guess I should say how many acres do you manage, and then how many were you experimenting with when you say smaller acreages of wheat, rye, and cover crops?

WA: **This farm is 2900 acres and we're working around 100 acres of these other crops.** And there was a time, **until very recently, when the only crop alternative for us was vegetables, peas and sweet corn. But the processing entity, which is Seneca Foods, has now shifted all of that production away from this part of the state, it is my understanding into irrigated production areas where there's greater assurance** of exactly what the production is going to be.

AQ: And where would that be?

WA: My understanding is that primarily south of Minneapolis/St. Paul, south side of St. Paul. If one drives south on 52 to Rochester, (??? areas where there are ??? irrigation???) and lighter soil and consequently the ??? for irrigation is obviously pretty good or they wouldn't be doing it.

AQ: So what kind of soil do you have?

WA: So that's sort of where we're at in our production.

AQ: Okay, so the **peas and the sweet corn went away when Seneca moved their processing out** and so then, **what got you to start with the soil structure idea with the smaller acreages of the wheat, rye, and cover crops**? What is your thinking there? I know you said it was to enhance soil structure.

WA: There are really, I'll try to be brief because it's rather complex in certain relationships, but there are issues of carbon loss in the soil with the tillage. Carbon is an important feedstuff, but for the microbial activity in the soil, and consequently, **things that could be done to enhance, well; to reduce the carbon loss are important.** The **different patterns of root system of the crops have an impact on what's going on in the soil structure itself, both physically the soil structure and also biologically, the soil structure.** So it's fairly complex, probably not totally understood by science but a keen interest among people who are dealing in the soil science.

AQ: And I've seen, I'm starting to do stories about it.

WA: That being the case, you no doubt know more about it than I do.

AQ: No, my goodness no, you are the one who's living and breathing it and walking it and planting it, but I am expected to learn about it and write about it. So I have curiosity on how you feel that, if anything has changed, how long you've been doing it, and do you have hope that this is something that is helpful for your soil health?

WA: Well **yes we're hopeful and as far as we can measure, we have seen some impact**, but we've been doing it off and on for about a half dozen years now.

AQ: When you do it, I've seen it done different ways, so some of the farmers, I worked with a watershed leaders network group with the Fishers and Farmers Group and we heard a lot of stories of different farmers in different parts of the basin, and one of the cover crop stories that was shared was that they were, some of them were learning different ways. Would you call these cover crops?

WA: Yeah.

AQ: Okay, different ways to seed it, different ways to, some questions were do you have to wait until the harvest of your field is…

WA: Yes.

AQ: And so then, **timing, when you plant it was one of the issues, or not issue, consideration**, and then we recently showed two of the watershed groups went to go see what was happening at Mill Creek in Wisconsin, and they had their cover crops pretty sturdy, the ones that they had done in the middle of the snow. And so my sense is it's a good thing, but there's so, **in terms of having an impact on water quality, much more room to go. What do you think of that?**

WA: Yea.

AQ: Okay, and what do you think about what would help**? Is that what's needed, more cover crops in terms of the relationship to the water and soil health?**

WA: **The short answer is yes,** I think so. And it perhaps would play out in a number of ways, but fundamentally both with respect to soil health and also with respect to the water quality. And in addition to that, what we're finding, some of the scientists working with pathogens and the ??? are finding that being able to have a wide variety of crops in the mix is very helpful for pests for the crops, be they pathogens or other fungi or wheat populations, etc., are valuable from that point of view as well.

AQ: Okay, and how is that, now that you're speaking about diversity of a variety of crops, **how is the kernza crop coming along from the University of Minnesota, the intermediate wheat grass?** I've heard a little bit about the variety of crops that are being developed at the University of Minnesota and one of them is called kernza, an intermediate wheat grass. I'm wondering if you've had experience with that and if that would be a possible alternative crop that farmers would…

WA: **I don't know enough about it. What its economic implications are and also, what's the market for it?**

AQ: **Right, so that seems to me to be a very important question of <u>what is the market</u>?** And can you tell me a little bit more about that as it's really important when you're trying to make a business in agriculture. And so developing these alternative markets, especially if they have diverse crops that are, as you describe, good for the biota and the structure of the soil. Where would you like and where do you feel the best impetus, support, possibility for advancement

along those lines, or **do you feel like there is possibility for building a market for alternative crops or no? That's a big question I know.**

WA: Yeah and the short answer is that **it's a huge question** and the answer is **I don't know and really don't have a good feel**. I wish I did because it would be helpful for us in decision making. But one of the things that's quite obvious is that **we have well-developed infrastructure for the grains that are being grown in Minnesota now and so it would, in some cases, require the development of some technology for handling and processing**. In other instances, the **infrastructure for handling and shipping and marketing** in part because of **the challenge of not mixing crops in the handling and marketing system.** And then that comes into play even with something such as **organic corn. It just cannot be mixed in the combine, in the bins, in the marketing channel with other parts of the crop.** And so before we had this recent cost involved in doing that, and therefore the **pricing is such that people, even if it pays or that people don't sell at a loss.**

AQ: And then also, **if you're going to do organic,** isn't that a **three-year transition**? Doesn't that take three years to transition a field from regular corn to organic corn?

WA: **At least three** and that means that they need to ??? that number of years and it may differ with different certifying entities, but yes, my understanding is that it's at least three years without the use of pest control chemicals, without the use of some types of generated fertilizers and so on. And so that's a big transition period, it's significant.

AQ: Yeah, these are big concerns, considerations. I can imagine, I'm not in your shoes, but I can imagine all of those things that people think of and consider. So regarding where things are today, Will, and it's 9:12am so I want to respect your time.

WA: I am now a bit late for another commitment,

AQ: OK, I'm going to let you go.

WA: but if it seems useful for you, I would like to visit again at some additional length.

AQ: I'd love to, would you be willing?

WA: Sure.

AQ: That'd be great. OK. Any chance I could come out and see your farm?

WA: Absolutely.

AQ: So my trick is - and with what I do is - I have to be effective with when I come, do as much as I can in a day, because I live in Lanesboro, so I'm coming a ways.

WA: You live in Lanesboro?

AQ: Yes I do. It's OK. I'm contracted to work in the whole Lower Minnesota River and this is my project now, so I can give it the time it needs in the next month. So why don't I get back to you

after I've had a feel of talking to some of the other landowners in the watershed and then try to time it so we have time to maybe sit down.

WA: And even if more telephone conversation would seem to be useful to you, we can do that again ahead of any visit.

AQ: Okay, the only other question I have **is there anything you wanted me to take from the article you sent me?** https://dl.sciencesocieties.org/publications/csa/articles/61/6/4

WA: I forwarded the article to you because **it came from our son**, who thought it was **a rather good summary of perspectives on the water issues as it relates to agriculture. And when I read it I concurred**. It does rather well I think evidenced in my thinking. It is such a complex issue

AQ: Yes, it is.

WA: I get a bit concerned that every now and then simplistic solutions are put forth for very complex issues.

AQ: I'm going to send you a couple links to some of the things I've written and we'll talk again soon.

MARY MUELLER INTERVIEW

COMPLETE INTERVIEW
JULY 23, 2017

ZOOM 0065
2::18.2

MM: I'm Mary Mueller and this is the farm that I share with my husband Mike. And it is in Sibley County, the western part of Sibley County and we've lived here or been involved with the farming here since we got married in 1983.

AQ: And how many acres are here?

2:38.3

MM: Well we have 360 acres right now. When we first got married, my husband had already owned part of the farm that he bought from his parents; it was 240 acres. So we have increased the acreage during our 30 some years of living here.

AQ: How many generations have been on the farm?

2:59.0

MM: Well my husband's parents, both of his parents' families owned half of the farm when they got married, so half was owned by his mother's side and the other half by his father's grandparents and I think one of his great-grandparents was actually born here in a soddy, but they did not own it, it was when they came over. He was born here, so that history goes way back.

AQ: Where did they come from?

MM: From Germany.

AQ: Awesome, okay, so can you tell us a little bit about the change that has happened here with the land, the way you use the land and how that was related to your economics?

3:53.4

MM: Sure, so when we first got married, we were actively farming the 240 acres, everything but the building site. So it was farmed in corn, soybeans, and small grain wheat. And we were young of course and trying to get started, pay for the land, so we both had jobs that helped support that farming operation as well.

AQ: What was your job?

MM: At that point I was working for Soil and Water Conservation District in McCloud County and my husband was working for a small local bank. Actually, yeah, when we first got married; we met, he was working for Farmers' Home Administration. So we met both working in McCloud County

4:44.5

for different government agencies. So that's kind of where that whole beautiful relationship started. So we were trying to figure out how we were going to pay for this farm and hopefully not have to continue with farming and working.

AQ: So can you tell me how do you make it work? When you started, did you have everything you needed and you could just do full-time farming?

5:34.9

MM: **So when we first got married, we still had a full farm to pay for, so we were both working jobs and my husband was working for Farmers' Home Administration and I was working for the Soil and Water District, both in McCloud County, in Glencoe, and that's where we met**. So we didn't decide to get married for quite a while, but when we did, by then Mike had a different job and he kind of went in and out of different jobs while we tried to make the farm work financially.

6:09.3

We were always also interested in how to make it work ecology-wise. It's my background, being at Soil and Water District, and also my husband, very interested in wildlife, he's a hunter. And he would say to me, "You know I love this farm, but I wish we had our mink, mallards, and muskrats back." He remembered that from when he was a kid.

AQ: And so you actually worked for Soil and Water, so you got a closeup look at what some of the possibilities were and did that have any influence on what you guys decided? Did it help? Tell us about the first time you put something for the Triple MMMs and did your knowledge of the Soil and Water Conservation Programs help you guys make some decisions there?

7:17.3

MM: Sure, **so we were looking at how do we pay for the farm, but we also wanted it to be ecologically sound, so economics and ecology are both important to us. And being at the Soil and Water District, I knew the different conservation programs, which was a huge benefit.** We played around with some things with the agricultural part of it, which had some ridge tillage and some different conservation practices that way, but **when the first Reinvest in Minnesota Program**

7:47.5

came out, which was in 1985, this was something we both could get really excited about. Mike wanted a wetland, 'cause he wanted his minks, mallards, and muskrats, and me, I love the prairie, so it's like this is something both of us love, if we could just get a little bit of land into the program. We owned the 240 acres at the time, we had the whole farm evaluated, only 15 acres qualified, which we were disappointed in 'cause we would have liked to have done more. But it was a start.

AQ: Say that again.

8:20.9

MM: **It was a start,** it was a start, we were happy to get that 15 acres. In fact, we would, **when we decided on a conservation plan for that 15 acres, we had to have everything, so we had a little tree planting, a little food plot, a little prairie, and we couldn't restore the wetlands. We dug a little pond, which isn't allowed on RIM anymore, but it was back then, so we got everything stuffed into that 15 acres.** That was our ??? We'd go out there whenever we had a chance and just enjoy that little piece of heaven. And we wanted to do more.

AQ: Do you just want to repeat for me?

9:26.6

MM: So we had the whole farm evaluated for the RIM program and only 15 acres qualified. And we got to be part of the ??? Conservation Plan, which is generally the way these programs work, to whatever can work into the program. We wanted everything. We wanted trees, we got a little woody ??? planting out there, we wanted a prairie, so whatever that wasn't in something else, got planted to prairie, which at that time was three native grasses, which seemed very diverse in those days. We got a little food plot, and then we couldn't restore the wetland, but we could put a pond in and so we dug a pond and we had our little piece of paradise; we were excited.

10:09.9

AQ: In talking to you, it seems like you've been very prudent and if it doesn't work financially then of course you wouldn't do it, so how did you, over the years, gauge whether it was more profitable or it made pragmatic sense for your wallet to continue to restore bits and pieces of wetland and prairie?

MM: So yes, after we did that first project, **we really did want to do more restoration work, but we had a lot of debt with the farm, we're paying it off, had equipment, we had to consider all that. And so we really watched what was happening with the different programs, Conservation Reserve Program, CRP, easement programs like Rim, and we also looked at business**

11:14.1

opportunities to restore wetlands and do prairie work. And so our second project was one that we really had to do a lot of evaluation. We had about 30 acres that we wanted to restore wetland on and we, at that time, looked into the Reinvest in Minnesota Program, but it didn't work for us financially. The payments were a little less than the value of the land, we were both still working.

AQ: Plus, it takes your time 'cause you have to do the work, right?

11:54.4

MM: **So when we did our second project, we wanted to restore about a 30-acre wetland and we looked into the Reinvest in Minnesota Program. We're still paying for the land at this time and also some other debt and equipment debt, and I had just quit my job because we had young children at that time. And so we couldn't quite make the Rim program work, it didn't make financial sense to us.** And **at this point, there was a brand-new law in Minnesota that if you drained a wetland you had to replace it, and if you couldn't replace it onsite, you could, through a program called, or through a business opportunity called Wetland Litigation, you could**

12:37.9

purchase wetland credits from somebody who was willing to restore the wetland and put it into a conservation easement. And that was a lot riskier, it was a lot of financial things that had to be done in advance, but we saw an opportunity to actually restore wetlands and make it entrepreneurial to actually earn some money doing that. And since I had just ended my employment and was trying to stay home with our kids, **we thought here's an entrepreneurial opportunity to restore wetlands. And so we were able to choose that route and that's what we did for our second restoration.**

AQ: So at that point, you are really taking land out of production, traditional land out of corn and soy and going down this wetland restoration, and it actually was more profitable.

13:38.2

MM: **At that point it was more profitable.** Now these things change, they come and go, and it was a really great opportunity at the time. We actually chose to do that with another project in the future, 'cause it worked out well. And with time, that actually became less entrepreneurial, so we had to look at other ways to do restorations. **Also, the mitigation banking is very focused on only on the wetland. There's very little upland in association with that, and to keep things really ecological, you need the upland along with the wetland**. So as we decided to do more restoration, we continued to look at other programs**, we continued to look at CRP, we continued**

14:25.1

to look at easement programs. There were times that we tried to apply for CRP and we didn't have any land that qualified. We had tried to get into easement programs, like the CREP program and didn't quite qualify, so we just kept going to the office, seeing what was available for programs and evaluating it both for if it be qualified, if we had the type of land they were looking for, and if it was financially feasible. And after a few tries, we were able to restore a big chunk of our farm into the Conservation Reserve Program. Things just lined up, so it was both a fair deal financially and our land qualified and then that's, in 1999, we were able to put a much larger restoration, about 100 acres into the CRP program.

AQ: So when you put land into CRP program, at least back then, does that mean you were restoring prairie?

15:33.7

MM: We qualified under a wetland program, so we restored both wetlands and prairies and we did a little more diversity in those seedings. We were able to add a few more flowers. Our wetland banking we used a lot of flower species as well because we had a little better budget to do that, so we were able to add a lot more diversity to the farm. And the interesting part for us was as we put diversity onto the land, we saw an increase in diversity in wildlife as well**. The songbirds, I wish I had kept track from day one, all the different songbirds 'cause we saw more and more songbirds returning. We saw insect species returning that we hadn't seen or even knew existed,** so that was really fascinating to me. All these different neat little insects and of course that's what the broods, the wildlife broods would feed on.

AQ: What's a wildlife brood?

MM: Like a pheasant, young pheasants, ducks.

AQ: **Did the muskrats come back?**

16:39.9

MM: **The muskrats came back. In fact, we started trapping on our own farm, which was really a big thrill, especially for Mike, but I enjoy muskrat trapping as well. And I could dig this out of the closet, but last year we had hats made out of muskrats that we harvested right here on the farm, which was really a fun deal for us.** And that's what our kids got for Christmas as well.

AQ: It seems like what you're saying is, through the years you had to weigh financially what's the best thing and if the program worked and your land worked for the program, then you would do it, but you would only do it if it made sense financially.

MM: Yes.

AQ: And what was the next line of progression?

17:51.0

MM: **Every decision we make on this farm, we weigh both on economics and ecology. We own it right now but it's not ours, we know that.** We want it to be better than it was when we got it, and we know it was better at some point in the past.

ZOOM0066

3:50.9

AQ: So you were just saying that throughout your whole time here on the farm, you've been weighing ecology, economy.

MM: **As we've worked with this land, our name is on the plat book as owners, but we know that we don't really own this land. We're occupying it for a while, and as we've made decisions on our time here, it's been a balance of ecology and economy. Part of the ecology is that we want to leave it better than we first received it, but also, we enjoy the benefits of wildlife, for enjoying**

4:41.2

them, but also for hunting, trapping, so there's a little bit of a harvest that goes along with it. We also want to make a living, we want to be compensated for our work, and so those are the things that we really had to balance. We spent a lot of time at the kitchen table with a pen and a calculator, making every one of these decisions.

AQ: And there's times when it just doesn't make sense to restore prairie versus keep the land in productive mode.

5:17.2

MM: So we've had some land that has gone back and forth. **Actually we did have one small piece that we had to break after it was in prairie, to bring it back into production and I hoped I'd never have to do that again and I haven't so far. But we've always weighed that agricultural economy and the restoration economy, they're both important** because **we both need food and we need environmental balance, and I think these restoration programs provide some of that balance.**

AQ: So if I understand correctly, the history that we have then is bit by bit you used the Rim and then you used the Mitigation Program for wetlands and then what else helped you restore the land?

6:06.6

MM: So **we also worked with the Conservation Reserve Program. We had a big part of the farm that was in the Conservation Reserve Program for I think about 15 years, and then we actually transferred that into an easement program, into the Wetland Reserve Program.** So it started as CRP and then went into the Wetland Reserve Program and **that gave us new opportunities for restoration as well. So we have restored some of the wetlands under CRP, but now that it was going to be a permanent easement, we could do a whole lot more.** We could add more wetland acreage, we added a lot more diversity in terms of wildflowers. **We got so much support and**

6:48.4

the Soil and Water District was wonderful with the programs, helping us to figure out, US Fish and Wildlife offered funds to helps us add more diversity in the flowers, and even some conservation groups donated money to help restore some of the wetlands. So it's been a, it just been such a wonderful team of people to work together.

MM: We've had this great team of people who helped us to make this work, both financially and the decision-making. Have you thought about this, have you thought about that? Offering suggestions, giving us a chance to have our input into how things work. It's really been a neat experience.

AQ: Do you feel like you're respected as a landowner here?

MM: Yes, I think so.

8:00.0

AQ: Not everyone (a) has land, (b)not everyone, even if they work in Soil and Water, sometimes they may not know your story or your experience. I would imagine that does not work, you really value when someone can really understand what you're trying to do and help you align your goals.

8:41.6

MM: **When we first started doing restoration work, it was pretty new, especially in this area. And there was some hard conversations with neighbors at times. There was hard conservation with agencies at times**, **especially when we used the entrepreneurial approach. That become a little more difficult and I think it's just that balance of understanding what it takes financially to really do this stuff and how you want your time to be compensated, not just your land. I shouldn't say just your land, but you need the land to be paid for, but you want your time to be compensated**

9:28.1

as well. And there were some interesting difficult times and you work through them. There's a lot of conversation. Sometimes you're assuring your neighbors that no, they're not going to get flooded out because you're restoring wetlands. And sometimes you're assuring the agencies that you're really doing the best you can with everything that we have to take in culturally, economically. So those conversations were a big part of making this work. And usually they went well, not always.

AQ: And so along the entrepreneurial spirit, it sounds like you have learned how, one way or the other, to work with your land, so can you tell us a little bit more about other thinss you're doing like seeds and, did you say you have pigs, steer?

10:28.7

MM: Well our farm has been in a number of transitions and **right now we're transitioning towards retirement. And as we've done that, we've decided to do some more hobby-type things with our farm. And so just a few years ago, we added a pasture, seven acres, so it's not like we're ranchers, but we're just having a little taste of that type of farming**. And **wanted to see partly how the animals would do on the prairie, so we had, it had actually been, the prairie or the pastureland had been in CRP, so it was made of grass and we wanted to see how the livestock**

11:07.7

did on native grass as we took it out of the program, converted it to pasture. It's been very interesting for us. We added a few pigs; that was when our kids were still here 'cause it was fun for them, and they're on pasture too, but that's pasture that we seed every year. And we have a few chickens. **We were able to put a solar array up a few years ago,** which really aligned with our conservation goals, and again, that's when we did a lot of pencil pushing that worked financially as well. So we're just trying a lot of different things and enjoying the ride.

AQ: Tell me just a little bit about the prairie seed business.

13:04.5

MM: **Back in 1999, we put our farm into the Conservation Reserve Program; we were no longer farming. We sold our farm equipment, and I was underemployed at the time.** My youngest child was going to kindergarten, so I was trying to figure out a way to still be here, but also have a job, and decided to convert our farm equipment into prairie seeding equipment. **Started with a small business called Mueller's Habitat Restoration and we would go and work with other landowners that were doing conservation seedings and we put just native prairie grasses and flowers from small businesses like ours that grow seed. It was very important to us that we work with Minnesota businesses.** And we would provide that service to landowners and we did that for about ten years, got out of it for about ten years and just started again last year, which I'm enjoying it a lot.

AQ: And are your kids grown?

14:08.6

MM: Our kids are both in college and one is finishing her Master's degree and the other his Bachelor's degree.

AQ: And are they interested in anything related to agriculture?

MM: They were ready to move on to more populated areas, so my daughter's working her Master's degree in social work and our son is doing a Bachelor's degree in mechanical engineering.

AQ: Do you think she's going to stay in the Twin Cities?

MM: She's in Rochester. She's applying for a job with Mayo right now, so she'll be done at the end of July. She had a job and she just decided it didn't feel right, so she's decided not to take it and she's applying with Mayo and a few other places, but she wants to stay in Rochester.

AQ: If I'm visually representing your farm, I'm going to see prairie, I'm going to see restored wetland. We talked about the three different ways that you funded the restored wetland and prairie, it was through Mitigation, it was through Rim, that was the first, then Mitigation, and then CRP.

16:01.00

MM: The land that we had in CRP in 1999, that converted to a wetland reserve easement in, I believe, 2008 or so, 2010, along with another 60 acres that were still farming. And because that's permanent easement, we were able to much extended restorations, so **we were able to tie all of our wetlands and prairies into one full-functioning group, because now everything's in a permanent conservation easement and stay with the land.** We took a little bit out now so we converted to pastures and food products.

AQ: So did you ever look at CREP?

16:48.2

MM: We did; our land didn't qualify for CREP on this farm.

AQ: That was the first time it came around, but now it's back.

MM: Yes, and our neighbors are looking at it for, especially for the ditch buffers, a lot of interest for ditch buffers.

AQ: I didn't know that you could do it that way.

MM: I don't know enough about it.

17:48.0

MM: I'll just tell you, when I was first doing the seeding business, I was approached by US Fish and Wildlife Service to help with visiting with landowners about the Minnesota River CREP Program and I was hired as a contractor. And so I sat on the other side of the kitchen table with a lot of landowners, trying to work through that decision, whether it made sense for them financially and ecologically. And that was a, really tied a lot of things together, to understand not only how we made decisions, but how other people were making those big decisions, 'cause that's a permanent easement. That's a huge decision.

AQ: What does it mean? When it's a permanent easement it means you can no longer work the land, correct?

MM: You can no longer work the land, so you are permanently, not just for yourself, as this land transfers ownership, you're making that decision for them as well.

AQ: When you're talking about CREP and maybe it's different this time around than it was the first time around, but at one time I had talked to David Minge who helped get that going. My understanding was that the uniqueness of this program was they could get federal dollars. State dollars, there's a certain amount allotted, but if you went into CREP and put into permanent, they would combine that with federal dollars and so the payment was significant for a landowner. Is that the same concept that's going on now?

19:40.9

MM: The way CREP works is the land is enrolled into Conservation Reserve Program and they received those payments for 15 years, so just as if it's in an annual program. And they also receive an easement payment, so at the end of those 15 years, it's now in a permanent conservation easement, and that comes from the state. So, the federal government pays the CRP portion and the state government pays for the easement.

AQ: And is the easement, does that go on and on and on or just for 15 years?

MM: It's perpetual, or, and I don't know what they're offering right now, in the past they had either a limited time or perpetual. The landowners could choose, but the payment varied. I don't know what they're doing right now.

MARY MUELLER INTERVIEW (CONTINUED as we toured the prairie and wetlands)
ZOOM 0070-71
JULY 23, 2017

MM: 1985 we planted the trees and then '87 it was drought, no it was '88 and '89 that's what it was, '88 we planted the trees and it was drought and we replanted in '89.

AQ: So you lost some from the drought?

MM: I don't even remember for sure, but I know when we planted those threes, Mike's dad has been sick and he just got home from the hospital and he was feeling really good the morning we wanted to plant trees and he asked if he could drive the tractor. And he did, and he passed away the next day. So those trees are very, very special.

AQ: They're the very first trees?

1:17.8

MM: The very first wildlife trees that we planted out here. And part of these trees were planted by our kids' preschool classes. They came out here. My daughter's class came out and we did that last row of cedars over here and my son's class came out three years later and did part of the CRP tree planting. So both of their classes were involved in the tree planting. So we still have second graders coming out every spring and doing tree plantings around Arbor Day.

AQ: So through the generations. I have one more question to ask about that. If you wouldn't mind, just tell me, did your father-in-law, who owned this property and farmed it, do you think he ever foresaw what would happen here on this land?

2:23.8

MM: We really just got started with restorations about the time he passed away, but when we walk or drive around, Mike will often say, "Oh I wish Dad could see this. Mom and Dad wouldn't believe what happened here." It's something that he really holds very, very dear, that he would love to share this with them.

AQ: When they were here, how did they farm it?

MM: Well, they had dairy, so they had pastures. They were farming it during the era when it was drained, so those were decisions they had to make with eight children, to drain the land in order to make it more productive, to pay for all the things that a family of eight requires. But they also had dairy, they had pastures, and the kids often talk, Mike's brothers and sisters talk a lot about the dairy farm, more than anything else. The cows were a big part of their history.

AQ: I just want to be clear, I'm not saying that in a judgmental way, you have to do what you have to do and it's good productive farming.

3:37.5

MM: That's what they had to do. There was no decision in that. Around that kitchen table it was like we have to figure out a way to raise these kids and pay for the land and that was the decision that needed to be made.

AQ: A lot of change on the land though.

MM: A lot of change.

5:05.3

MM: At night when I was working with the farmers on CREP, as a farm bill specialist, all the stories, you would have just loved hearing those stories. Some of them really stayed with me.

19:10.0

MM: We planted these trees as part of the first Rim program, it's a wildlife shelter ???. And the morning that we were going to plant was, my father-in-law had been quite ill for quite a while. He had been in the hospital, but he had just gotten home. And he was feeling really good that morning and he asked if he could drive the tractor for the tree planting. So we were thrilled to have him help us with the planting and that night we spent a lot of time talking about the easement program and then the next morning my father-in-law passed away so the trees ???? are significant for us.

MM: These trees hold a deep significance for us.

29:59.2

MM: That is that 15 acres from our very first ???. The prairie land and it falls into that low, the low into wetland, that pond. The trees were a shelter ??? that went all the way around. You notice it's really diverse in flowers, those were introduced later. So we just had three grasses, that was that first seeding, and then we later got flowers.

AQ: So the actual pond part is right over there?

MM: Where that dead tree is. So that's laying in a wet land that actually eventually kind of restored itself, then there's a little burn and then there's the pond just beyond that.

35:40.9

MM: That's the boundary of the Wetland Reserve Program, that sign right there. It kind of looks similar but that's Wetland Reserve, this is the Wetland Bank and that's Rim. So the reason there's a sign in the middle of it all is that's the boundary of the Wetland Reserve Program. So you see where it goes like this? So that's Wetland Reserve Program. That's Rim Program and this is the Wetland Bank. So that's what I was saying about piecing a bunch of stuff together.

AQ: Do you have any schematics, sketches or drawings that point stuff like that out?

MM: It would take an aerial photo and it would take a little work to pull it together.

38:38.5

MM: The only important thing is no trails on the Wetland Reserve. They're very picky about that.

ZOOM0071

AQ: Alright Mary, will you explain what this is?

2:02.5

MM: Doing this large-scale restoration project took many years, and we did it in stages. And this little area right here is the confluence of three different projects. And to the right is our very first Reinvest in Minnesota Project, that 15-acre project. As we look out this way was our very first wetland mitigation ??? and it was about a 30-acre project and it happened in the early 1990's, about 1996. And this area over here is part of the Wetland Reserve Program and that's what these signs are denoting the boundary of. And that program started in 2010 so just a lot of history all coming together right in this area. And the beauty of doing these projects in stages was different rules, so we got to have trees and we got to have grasses and wetlands with a lot of variety.

3:30.4

MM: We restored this farm over about a 30-year period, taking advantage of different conservation programs and some business opportunities. So this area is a convergence or confluence of three separate conservation programs. To our right is our very first conservation easement and that was part of the Reinvest in Minnesota or RIM program. And over in this area is the very first wetland mitigation bank where we were able to do our first wetland restoration and prairie seeding, and off to this area is part of the land that was in CRP and is now a Wetland Reserve

Program easement. Part of the joy of the many years is that we were able to do different things that were in vogue at the time, like our large tree blocks, which they wouldn't allow now, but were allowed in the 80's and 90's and add a lot of diversity to the whole farm.

4:54.8

MM: This is the convergence of three different conservation programs and entrepreneurial business to restore our farm. Over here is the Reinvest in Minnesota Program, over here is a wetland bank and this is part of the Wetland Reserve.

MM: Right here is the confluence of three separate conservation programs that we used to restore this farm. The Reinvest in Minnesota Program over here, a Wetland Mitigation Bank over here, and the Wetland Reserve Program.

AQ: How many acres?

5:33.0

MM: The total project is about 330 acres

AQ: And did you stay fiscally sound?

MM: We did alright.

Mike Schultz Interview
District Manager, Le Sueur SWCD
June 17, 2017

AQ: Okay. I'm wondering if it's just kind of an awkward position sometimes between the landowner and someone like an SWCD person who also has the ability to enforce the buffer law but is also trying to get other BMPs going and establish this **trusting relationship**. I'm just wondering especially, given some of the political tensions and the change in the political climate it seems recently, that it's just touchy, because I can't figure out why people would not want to talk about the relationship with the landowner. What were you saying about Le Sueur?

1:11.6

MS: In our county we're unique, as I worked in other counties, I've worked in several of the counties in Minnesota, I noticed that **one thing different our county has is that we have most of the environmental stuff come to our office in the front door.** And over the years, we've been heavily active and worked with many of the landowners in our county and one thing we have in our county is a ditch inspector that tells us, and water office that works with the county ditch system, along with the rest of our average ??? and support with that, but one big issue we deal with is drainage and everybody comes to us with questions. And we've gained relationships now with a lot of farms and it gives us an extra opportunity to talk about conservation at the same time we're talking about drainage. And with our limited funds, we've been able to ultimately coactively **spend it almost before we even get it with the demand that folks have come in, and we've got a great partnership with our federal partners for many years on going back with EQIP and even before that that had an CRP program that they had funding that we**

2:21.6

helped with landowners to try to do BMPs back in the early 90's and even before. So **we've gotten to know some of the generations of famers; the older generations and the newer ones that come in and we try to promote when we have an opportunity to talk about what is the new thing the district's doing** and a lot of folks hearing about it and we're able to couple that with the ??? incentives or ??? I guess, folks are more apt to want to do things and **we have a lot of people that come to our front door and ask what we're doing or if we have any funding available**. So we get out and about and it may not be fully marketed but **it's more by word of mouth** and we work throughout the whole county so it's…

AQ: Can you explain to me what's currently going on with the drainage scene and how does that bring them in?

3:25.5

MS: Well as a ditch system, **we have 70 county ditch systems in LeSueur County**, now I think there's only 58 backup systems, but ???, and in the meantime, we have everybody that's interested in drainage, 'cause if you've got water in the field and you've got growing crops, so as soon as that becomes an issue, they ask us to go out and take a look and usually they have an idea or if there's some blockage or culvert issues, we go and review that and ultimately try to get the work lined up to get it repaired. But **right now we're in a really wet cycle actually for almost the last five years and the demand for ditch work has been through the roof.** And so **we go**

out and try to make sure we're doing the right thing for ditches, making sure that we have the ability to drain. Now we're not draining any faster, we're just making sure the ditches are ??? to the original profile that it was designed for and sometimes that's not enough for landowners, but we set them in the right direction if they need more than that and that's to the County Board

4:29.3

and the County Ditch Authority, which is above our heads. But drainage is, if you drive the countryside and you see a lot of folks ??? that water, **it's got to go somewhere and you've got to have a clear outlet to get it there, so those folks are working on that and we're able to promote our conservation side when we meet with these landowners 'cause it's not just a quick meeting, it takes some time to go out and look at sites** and **usually jump in a truck or a side by side and they point out some of the issues and we try to talk about what the ditch system needs and maybe some of the things that are adjacent to it.** And **that's how I believe we're able to get better relationships because once they get better drainage, they're pretty appreciative of our efforts of getting that accomplished in that time and manner.**

AQ: So if you get on the drainage, are things that go along with it that you could possibly also package together would be like a control structure or bioreactors or…

5:28.1

MS: **Bioreactors are a hard sell**. It's not that people don't want to do them, **it's just the cost and finding funding for them is difficult.** I've talked to several landowners that have heard about them and asked questions, but getting the funding and it takes a lot of effort and to go ahead and identify that. But if you rewind, **we're able to play, some of the road issues, buffer issues, farming practices that might just need a little tweaking that could use help to better the farming operations** and you know not everyone is receptive to what we say, but sometimes I feel like it's nicer to just let them know and **maybe a year or two down the road or more, that they finally receive that information, not necessarily implementing it, where they come back to us for some more guidance.**

AQ: So what kinds of things do you guys find are most commonly done in LeSueur County, I mean that goes along with addressing drainage?

6:25.8

MS: **We do a lot of sediment basins and siding (?).** More recently we're **talking a lot about cover crops** to folks that might be interested. We bring it up and they seem somewhat interested, we try to **let them know what their opportunities might be through cost share** or the seconds that we have through our office and maybe some of the watershed projects we got going on. But those are kind of key things and with drainage there so much to it through trans manuals, **through drainage improvements that engineering the systems back to or to what the system needs nowadays, the history of these ditches, some of them a 100 years old** and just like technology, we've hardly used anything that's 100 years old anymore. **So trying to get these ditches into a situation or in good shape, the demand that the changes of the landscape need now that we are providing an adequate source for this water. Now 100 years ago, we had more wetlands, and the land was used for pasture, now it's row cropped to tiles and not much pasture anymore, very few wetlands.**

7:43.3

AQ: And so do you think that the overall water quality health in Lower Minn River is good and improving, or how do you think this all ties together?

MS: **I'm not going to say the water quality is improving**. I do know a lot of science has said that we've done a lot of work in the uplands to at least reduce soil erosion into our water courses.

8:14.4

AQ: Okay.

MS: But that doesn't mean we're not reducing phosphorous and nitrogen, and applications to land and guidances have changed throughout the years and reductions are made and farmers are trying to make their best judgement when it comes to those operations. But I'm not going to really say we're making improvements because I haven't really seen the documented efforts saying no, it's gotten better or it's gotten worse. I know that through a lot of our recent findings in other watersheds, actually it seems like **we're getting more nutrients into our system and having trouble than we've ever had and you know that we may have less sediment transport to our systems. So I'm not going to state that it's getting any better.** I know we've got a lot of work to go ahead and everything ??? and once we get caught up with our technical side to help

9:09.7

improve those things, then usually the industry or a farming operation changes it in another direction that we try to help work with and just try to get application rates and land management done a certain way to help improve those things. Another big issue is what we're having **the main river basin on the Mississippi River has a lot of in-channel deposition from erosion from high water**. So that's another issue that we're not able to manage really from our perspective, 'cause **we have so much water on our land already and we're sending more water there as every day as we put more drainage in the field**. So it's something that we're well aware of and we talk about it on a daily basis. **Ultimately our whole goal is to have better water quality and how to get there being we're a voluntary conservation office, I really don't know, but we do a lot of marketing and outreach.** And a lot of **farmers are trying to do what's best for their land, their farm and then also the environment**, **so it's tough to try to see how things work in those scenarios.**

10:24.0

AQ: So it sounds like you've got a good **effective team that gets a lot of work done** and you've got people coming to you in a pretty regular flow, meaning **landowners seeking help**. So **do you attribute that to any soft skills, like understanding values or understanding the pressure the farmer's under, or people skills,** meaning understanding the need to take a growing season and produce the most one can, but also try to make the right decisions, 'cause I know -I can't remember if it was you, Mike, or if it was one of the other people in the watershed- identified that with the cost of the **cash crops, particularly corn being relatively low for the last couple years, two, three years, that there is a higher demand for CRP** and so those programs have been requested more than usual up to the amount that is capped off. Is that about right?

11:51.2

MS: I don't know.

AQ: Is that too broad of a question? I'm just wondering**, is there a relationship piece to this in understanding what the landowner needs?**

MS: Well basically **it's supply and demand**. **When farming is good and the money is good, farming more acres allows you to make more money. And right now we're at a low end and the land rep is too high and if you've read any science in 2017 or any future projections it's that if you don't know your farm and it's not paid up, you're losing money this year when it comes to farming.**

12:34.0

That's kind of what I've read, especially if you're paying for rented ground. And that's just the flow of farming I guess. But in the meantime, this isn't anything new to the agriculture industry; they've dealt with ups and downs and these scenarios for years. And **right now cash rent's too high.** We have programs**; our CRP program is very well in the meantime, it pays decent for the time being.** Now **if things slowly change,** that might reduce, but as we evolve and move forward, **some folks, they've done things for so long that change is really hard to accept.** And the **hardship of having to be required to put buffers into the governor's initiative**, things like that, that **changes the way they have to do things** and people, there's **quite a few people that don't like regulation** and all that. So it's more of a diverse background and you ??? how we kind of market these things, **understanding the person to begin with** and see how to approach it. Not everyone can be dealt the same and I think that's how we gained our relationships, trying to understand the landowner, they come in see their needs.

13:58.2

AQ: Okay, well if you thought that the best, **what was the most hopeful thing right now** for what you see in your area of the watershed, what would you say is **the most hopeful momentum that's good for the land and the water?**

MS: Actually, **I think we got the momentum going in our Cover Crop Program**, I really do. I've certainly **heard landowners talk about the benefits** and the good benefits behind it, which is promising in land. We've gotten acres signed up. The more we talk about it and the more we let people understand that that **growing organic material with all the macroinvertebrates and bugs and microbs in the soil that are able to keep, work in some of these soils when they're wet and keeping that soil living, allowed them to continually produce at a higher level and can also**

15:16.3

provide many other clean water benefits, filtration benefits and erosion benefit. So that, I think is the most promising part if we can keep soil and sod on the ground through our winter seasons, it allows for reduction in erosion and keeps that site green for the beginning of spring until it's either worked through or killed off. So we do have some momentum and **I hope to find newer techniques to make it easier for landowners to get it in, but in the meantime, we want to continue to push them forward on this.**

AQ: How many acres roughly are in, out of how many acres in LeSueur County?

16:02.8

MS: I know that we have a couple hundred acres locked up already and as we continue to more, ??? farmers are starting to see the benefits ??? and trying to find ways to apply it to more acres on their farms. **Maybe at some point, if we get to that level we're able to get them to start**

reducing tillage and plant for more cover crops and ultimately see a cash increase to their net in the future by reducing input costs.

AQ: I'm going to be talking to a gentleman, I was going to talk to him tomorrow, but I've had a fever the last couple days, so I'm just going to reschedule for Monday, but Monday morning I'm going to go out and talk to a gentleman who is near Winthrop who is trying new ways to put in cover crops and have his cover crops grow simultaneously while the corn does. And I think he's working with the MDA as well, but it'll be interesting to learn from him because he said he had

17:29.1

to kind of jerry rig his own machine in order to do this and I know that, just talking to a few other farmers who do this, in Iowa, some in Wisconsin, Ohio, and a group in Illinois. The **questions that they heard are what kinds of equipment does it take and how do you get access to something that's capable of planting without having to go buy new gear? Like in Wisconsin, they have a system, it's really like a planter that farmers all share just to get the cover crops in**. And it's tied into a program where somehow…

MS: A cooperative?

18:32.7

AQ: Yeah, might be. And so that if anybody wants to try it out, they have the opportunity to use this gear at no cost.

MS: **We do have that in our XXX Watershed, which is in Scott County, which is also part of the Lower Minnesota Watershed, but it falls into the metro area and we are able to use it in the ??? Watershed**. We have a piece of equipment that's **a highboy they call it, but that's just a little right on the tipping edge of everyone's likability to this—not enough has been done in our local area to get people to believe in it, that's the trouble there**.

19:14.6

AQ: And do you have to work, so getting them to believe in it, and then of course, **they've got to hear the stories right?**

MS: Right.

AQ: And **who are they going to hear the stories from?**

MS: We have **a handful of guys that have actually used it**, and success has been some and others you know, and that's where we're at in all that marketing phase. And **we've got people putting in cover crops late in the season and then we have people putting cover crops on, getting ??? on and then there's this one where it's a little bit like a late June application, but that's just in the middle of the growing season, and people are worried it's going to mess up yields**, so they're worried about it in that case.

20:00.0

AQ: Yeah, well I've got **a network that I should probably connect you to, of various farmers who are doing it across the Upper Mississippi River Basin, it's the Watershed Leaders Network. And the McKnight Foundation has been kind enough to support the beginning of it**. And what I did is just cover some stories, I think I maybe sent some links to the whole group when I first

met you guys, of the kinds of things that these farmers, when they're not in planting season or harvest season, have been willing to share with each other because it's so hard. Like you say, **it's in its infancy and there's not a lot of places to look to see culturally where and how it's been done and what are the success rates.** And a colleague of mine, Nancy North has been trying to convene them. I think their next step or what they were hoping to do is work with the Ag retailer community and the banking community to try to make it not so hard on the farmer and find incentives for everybody, but if everybody could start to work

21L49,1

together on this, it would be, 'cause **if the farmer's willing to try, then of course, probably the ag business will follow the farmer.** So there were some stories that they were swapping that some of the things that they were trying to understand is how much input cost was there, how much time and labor is involved, and do you get some of the same kind of harvest, and also the planting season was a big question for some of these guys. And so there was a farmer from Iowa who had been doing no-till for ten years and he was just starting this cover crop, second year into it maybe, first or second year into it, and so the jury was out yet on how much he was going to save, the overall economics and the financial picture for him, but he said that **he definitely was saving with the no-till $100 an acre on input. Does that make sense?**

MS: Yeah, it does, I don't mean to cut your story short here, but I do need to run here pretty quick.

23:00.0

AQ: Oh sure, no I was just saying 'cause Greg was saying that there's no one closer than 15 miles around that he can talk to, to kind of swap notes.

MS: He is **actively searching someone always on how he does business and how other people are doing the thing that he's doing,** so I'm aware of that right.

AQ: Alright, I'll let you go, thank you so much for your time.

KEITH HARTMANN INTERVIEW
INTER-SEEDING COVER CROPS INTO CORN
GIBBON, MN 55335

KH:
Keith Hartman, address is XXXXX, Gibbon, MN 55335.

AQ:
And Shelby.

AQ:
What's it like to be starting your family and you have this farm…

SH:
It's exciting and overwhelming all at the same time. It's a lot being a new mom and trying to take on all of those new responsibilities and we have a lot of new stuff going on on the farm and it's a lot of new all at once, so that's the alarming part. But it's exciting 'cause I know he's doing some really awesome things out in the field and having a new member of the family is really exciting. And so it's kind of a whirlwind of all sorts of emotions.

KH:
It's been a lot of long hours lately. It's been tough not seeing him a lot, but something we have to do being a beginning farmer and trying to make everything work is put in the hours right now and I'm thankful Shelby's a teacher, so she's got the summer off to spend with Sky, so it's a blessing that way. She gets to be with him all summer.

SH:
Don't have to worry about going back to work quite yet, get to just relax and enjoy.

AQ:
Where do you teach?

SH:
For GFW Gibbon Fairfax and throughout the area. I'm a teacher at GFW, I've been teaching for two years, I'm going on my third. I did two years in first grade and this year I have a new adventure of teaching third grade, so it'll be another new and exciting thing in my life. Work with some pretty great people in the community and it's been a great way to get to know everybody, since I wasn't born necessarily locally in this area. And that's where Sky'll go to school.

AQ:
(to Keith) Did you know you always wanted to be a farmer?

KH:
I did, yeah, I grew up on a farm and I went to college to be a farmer and it's something I've always wanted to do.

AQ:
Where did you go to school and what did you try to learn?

KH:
As I grew up on an organic dairy farm two miles from here, and so I wanted to be a farmer. And I went to school at Ridgewater College in Wilmar, Minnesota for farm operations and management, and then I went back again to get my Ag Business degree. So then I learned the production side as well as the business side. And then after college I worked part time as an agronomist at ??? Coop for four years, where I learned a lot more about agriculture, conventional agriculture and then yeah, it continued from there I guess. That's where it all started.

AQ:
So you grew up on an organic farm?

KH:
Yes, we had a 35-cow organic dairy farm, we had 450 acres. My dad had been certified since 1996 and we raised corn, soybeans, alfalfa and wheat and that was all, in a rotation. So that's where I got my start. So all I knew about farming was organic production; I didn't know much about the conventional side of it until I went to college. And then I learned the conventional side so I consider myself a hybrid farmer; I know both ways, I know the conventional side and the organic side and there's ways to work together. It doesn't have to be organic versus conventional, we can learn from each other. So it's been a great thing that way and been fun talking to others and educating others that way.

AQ:
Does it feel like you're, as a new family starting off with all this big effort, does it feel like there's risk, yet a good future or how would you describe that in terms of like okay, this is what we're doing? Is it scary, is it exciting, is it risky?

KH:
There's a lot of risk with farming and production agriculture, especially being a young farmer, not having a lot of capital and assets behind you. So it always takes a start. My dad allowed me to rent 140 acres right out of college, so that was my start. And then I started my own custom baling business to help to get things through and then started raising some livestock, just to diversify. So that's been helping with the risk management. There's a lot of dollars in farming, but I think the risk is worth the reward and I love being my own boss, I love being able to be here with Sky and Shelby when I can during the day. But yeah, there is a lot of risk in it.

AQ:
Can you tell me a little bit more about, you did the livestock feed, but then you also did, you were an agronomist for four years. Did that help inform?

KH:
So after college I worked as an agronomist for four years and during that time I worked in seed sales and I also got to go to a lot of meetings where I learned, heard a lot of different speakers, learning about different soil attributes and that really helped shape where I wanted to go with my farming. So I took a lot of that back with me to my own farm and branched off of that into diversifying with cover crops and just my other cropping and split nitrogen applications.

AQ:
So Shelby are you learning a little bit about farming now?

SH:
It's all been learning. I didn't grow up on a farm, I didn't know much about farming, so the whole thing, our whole relationship I've been learning little by little. He started off with chickens, so that was my first experience on a farm and with the organic cows, that was a lot of fun, I love cows, they're probably my favorite. It's all been learning.

AQ:
Are the chickens for laying or for broiling?

SH:
Meat birds, yep.

AQ:
Do you have chickens here?

SH:
Not this year, this is the first year he hasn't done chickens, just too much going on right now with everything else.

KH:
I filled the barns with pigs, so I don't have any room for chickens this year.

SH:
Yep, we have a barn full of pigs and we have a pet goat, we got as a wedding gift from our groomsmen, his name is Archie. I always wanted a goat and I knew the only way I would get one was if I got one without Keith having to get one for me. So we have a pet goat named Archie.

AQ:
Let's start with if you could explain to me what you're trying to do with your cover crops right now. Here's the deal—I want some older farmers nearby who still have years left to see what you're doing and get inspired. I also want them to, younger farmers to hear your story and feel like it's not impossible. But you have to be honest about how hard it is and the work involved. So let's start with if you could describe your farm, what you have here and when you got it and just a general description of it.

KH:
On my farm here I've got a farrow finish, 20-sow hard operation, that's the sows are all on pasture and the pigs are on pasture. I farm my 320 acres of corn, soybeans, field peas, barley, and alfalfa and I've got 70 acres of corn, 120 of soybeans, 90 of peas and 30 of barley. Now peas and barley are all fed to the hogs and those are transitional organic acres. And then my corn and soybeans are conventional acres.

AQ:
On your acreage with corn and soybeans, can you tell us, have you been doing some research and trying to figure out what you want to do with that land, and what have you decided to do?

KH:
So in 2013 I started doing research on cover crops as a way to reduce tillage. I wanted to try to use those roots to do the tillage for me and that was my main start in getting the cover crops. And so I wanted to figure out how to do that into a corn and soybean rotation, but up in South Central Minnesota, we don't have a lot of heat units to grow a cover crop after harvest like they do in other parts of the country. So I started looking at ways, how we can get that incorporated into our corn and

5:48.2
soybean rotation, and that's when I came up with inter seeding a cover crop in the corn at V-6. So about the middle of June or 12 to 18-inch corn. I figured at that stage we could get the cover crop established and growing and then the corn would canopy, shade out the cover crop until September, when the corn really started to dry and drop and let more sunlight through to get that cover crop taking off. I had all these ideas, but I didn't know how I was going to get that done. I started looking around at different

6:20.0
pieces of equipment, how I could do this, and since it was during side dress season, or split nitrogen application, I wanted to do it all at once to get a better return on our investment and make better used of our time, since we're making that pass anyway. So then in order to do that, I found some equipment from Yetter that I wanted to use. So I went and researched some grant work to help pay for this, and I

found out, I applied for a grant through the Minnesota Department of Agriculture, the Sustainable Ag Demonstration Grant, I applied for an innovation grant through Minnesota Corn Growers Association and I worked through the Natural Resource Conservation Service on their Equip Program to fund this equipment and to do research on my farm.

AQ:
How did you know to do that? How did you know where to go?

KH:
I Googled a lot of it and I made a few contacts with the Sustainable Ag Demonstration Grant; I had someone recommend that to me. Otherwise just went out and Googled different grant programs and just to try to get a start. And my big research was I wanted to make sure that I wasn't going to hurt the corn yield was number one. Right away when I started as people said what's the difference between a cover crop and weeds? You're planting weeds out there, it's going to hurt the yield. And my thought was with planting later, the corn yield starts establishing its ear size at V6. So I'm coming after that

weed-free period in the corn. But that was still number one. I wanted to make sure that I'm not hurting the corn grain yield because it's not the ??? practice if we're hurting yield to get a cover crop planted. So that's test number one. Number two is I wanted to see how many nutrients that that cover crop was holding in the soil. So after the corn is mature and the corn is off and we get a first killing frost and the cover crop is dead, then I go out and I take a soil nitrate test to see how much soil nitrate that cover crop is holding or that's less in the soil that's mobile that can go into our water. And then third, I

Wanted to make sure that cover crop isn't taking nutrients or water away from that corn. And that's the other thing where we want competition, is that going to compete? And so that's another part of my research that I'm doing. And I'm on the second year now with working with those grant programs on the research and I'm finding…

AQ:
How many years are you doing?

This is a three-year program, so I have one year left. 2018 will be the last year of the research so I have three years of data on that program. So far I haven't seen any yield hit. It's not declining the yield. This first two years I haven't seen a yield increase, but that's not what I'm looking for. It's not my goal right now. I just want to make sure I'm not hurting the yield. I'm holding about 15 pounds of nitrogen in that cover crop strip versus in the soil, so that's in plant form until next year. So that's nutrients that won't get into our water source.

AQ:
And is probably saving you money.

KH:
And it is. It's holding for next year, so when that cover crop deteriorates in the spring, it'll release that nitrogen available for the following year. And I'm finding out the cover crop is not taking any nutrients away from that corn. I've been doing stock nitrate testing to make sure that I have sufficient nitrogen in that corn plant and it is, it's not hurting it, because that cover crop in that strip is only getting to be about four inches tall and then basically dormant until September. So that corn plant doesn't know it's

there. The other question I get is what if we get a drought year, is that cover crop going to be taking nutrients, or water away from the corn? And what I'm seeing now is being only four inches tall, that cover crop is so short, if we do get a drought, that cover crop will die before it hurts the corn. So you'll be out your cover crop investment, but you won't be out the corn yield. And I can talk about my progression into it. I didn't start just with this unit.

AQ:
Could you recap the goals real quick and then we'll go into the history of what led up to this?

KH:
My goal for this is I wanted to be able to establish a cover crop in my corn rows around that B6 timeframe and I wanted to be able to, and with that, I wanted to make sure I didn't hurt the corn yield, and with that, I wanted to make sure I didn't hurt the corn yield, I wanted to see how many nutrients I was holding, and I wasn't taking nutrients away from the corn. My end goal with this was to find a way to reduce tillage by using the cover crop roots to do the tillage for me instead of doing fall tillage. That was my main goal when I started all this.

AQ:
Why do you want to reduce fall tillage?

KH:
I've always hated seeing black row ditches in the winter from wind erosion. We do find fall tillage in this area because we have very heavy clay soils and it's hard for them to dry out in the spring. And that's our main goal to do tillage. Also to break up compaction. But with that, you do get some wind erosion when we have an open winter and it's something that's always bothered me since I was a kid, so I wanted to try to find a way to reduce that. And with the cover crop species, they have such penetrating

roots that a lot of them can break up that compaction, and that's been my main goal.

AQ:
And then how does that help with the water?

KH:
How it's going to help the water is by holding the nutrients. With the cover crop, they're a lot more frost tolerant than are row crops. So that cover crop is going to be alive until the end of November. It takes almost a 26-degree temperature for four hours to kill this cover crop and specifically the annual rye grass. And that's got a very fibrous root system that's aggressively taking up nutrients in the fall, when that starts to take off. So any nitrogen that's left in that soil is going to be taken in by that cover crop and that's how we're really going to help the water is with using those roots to absorb that.

AQ:
Can you now tell me what is the story that led you up to this inter-seeder, what you're doing now and how did you get there? How did it begin and what are you doing now?

KH:

So one winter I wanted to design this inter-seeder. I had my goals in mind, I wanted to be able to establish a cover crop, I wanted to establish a cover crop with high efficiency. A lot of guys were flying it on with the airplanes in August and they're using 25 to 30 pounds of seed, which is about a $50 seed cost per acre with a 50/50 success rate. To me that wasn't good enough. I wanted to be a lower seed cost because it does not cash flow, it would not be a sustainable practice. If I wanted to be able to get good seed to soil contact, and I wanted to be able to accompany it with applying nitrogen. So those are more goals looking for equipment. I found a Yetter strip freshener that I thought would work and it'd be a dual purpose. So I contacted Todd Newbury out of Illinois and he sent me three units to play with, to try. He said, "I'll send these to you, you pay the shipping, and just play with them, see if you can get them to work," because he believed in experimenting with agriculture. He was the inventor of this Yetter, of the strip freshener. And what that is, it had three shark tooth wheels, so spiked wheels on it like you see on this one, and it lightly loosened the soil, and then behind it I put a firming wheel for good seed to soil contact. So he invented that out in Illinois and then he sold that patent to Yetter. So

He still had worked with them. So that's why I contacted him, just out of the blue. He didn't know me from Adam so I just asked him. He sent three and said use them, experiment with them. So that's how it got started. I had a three-row unit and I did 20 acres that first year with seven pounds of seed per acre. So I had a $10 seed cost and I had a great stand out there. It was about 85% emergence, which is excellent. So that's what got me thinking that hey, this can work. We gotta figure out how to

incorporate the seed into the soil. So then the following year, that's when I knew, after checking the yield, no yield hit, that's when I knew I wanted to build a 12-row machine, a 30-foot inter-seeder. I wanted to show, it added validity to it. If farmers saw that I did a three-row, just a nine-foot unit, they'd say, "We can't cover our thousand acres with that." So I wanted to make a big, I wanted to make a life-size machine that could cover acres at high speed and do a good job because that's how we're going to

get our return on investment, and that's what's going to get more people excited about it, rather than just my demo. So that's why I wanted to build a bigger unit.

AQ:
So are you building these not only for your use, but hopefully to develop a product line for other farmers.

KH:
The equipment that I built, I've used other pieces of equipment and just pieced them together and made the practice. My main goal is to show how this practice can work and help other farmers build their own or using that same equipment build one. I'm not looking to build equipment, I'm here to help share the story and how others can do it and use these cover crops and establish cover crops efficiently and get a return on their investment. Because we can handle a $15 per acre seed cost versus a $50,

17:58.9
especially in this tight market. So that was my main goal. So after, last year I used the inter strip fresheners on this bar and I had very good success inter-seeding. This following year, in 2017, Yetter came out with a new unit called, it's a Yetter Magnum 10,000. It offers a shark tooth wheel and the firming wheel, and those were very important for seed to soil contact. And so I'm running with those

units this year and I'm doing some research for them as well to see how it works with the inter-seeding, because their product was just made to put nitrogen on. But I said, I bet I could get that to inter-seed cover crops and they're a very well-known equipment company, so they want experiments in this too because they believe in these cover crops.

18:49.7
AQ:
So you're way advanced and for the person who's just trying to understand conceptually what you're doing, you're trying to not only seed, you've already planted your corn and now what you're trying to do is go in while the corn is growing and inter-seed and put in a cover crop, like put seed in for the cover crop now and have them grow simultaneously.

KH:
So with my inter-seeding, what I'm doing is I planted the corn in May and now when the corn gets to be about a foot tall, I'm coming in with my machine and I am putting an eight-inch strip of cover crop seed, this year annual rye grass and radishes, down the center of my corn as it's growing. That way, I can get that cover crop established so it grows and gets to be about four inches tall and then goes dormant until September. If I waited until after harvest to seed the cover crop, it would just lay there in seed form because we don't have enough heat after harvest in mid to late October to get that cover crop growing. So that we would not have return on that investment, that seed investment. So that is what I am trying to accomplish with this machine and using a low seed rate and high success rate.

AQ:
So then the cost savings come in on which line items?

KH:
So the way I look at it, the first-year return on investment, since I'm not, this first year I'm not seeing a yield increase on the corn, but I'm not seeing a decrease. Where I get my return on investment is my reduction in tillage. Fall tillage can cost between 20 to $25 per acre with the heavy equipment, the fuel that it takes, and so with your $15 see cost on your cover crop if that does the tillage for you and you can reduce that, that's how you make up your immediate return on investment. In the future years

you'll see the turnover on your soil for having the cover crop in. Last year I saw a lot of great things, the way the soil, just the texture of the soil and the condition that last fall, after I took my corn off, and I had a cover crop growing. And that cover crop was only out there for six months, but having that extra month-and-a-half of living roots made a huge difference with the soil texture. I was seeing ten to one earthworm populations in that cover crop strip versus my check strips. And that's what really gets me excited about cover crops, that we can change our soils that quickly.

AQ:
When I first came, you said that the, when you grew up on an organic farm, you really noticed there is a big difference between the soils, the color of it, the texture, the life. Tell me about the changing of the soil and if you wouldn't mind, just tell us that you grew up noticing differences.

KH:
So my big aha moment I call it with getting excited about cover crops was, I grew up on an organic dairy farm and in 2009 we rented a neighbor's farm, which was farmed conventionally. It's always been farmed conventionally. We noticed it took a lot more horsepower to pull through that conventionally farmed soil than it did our organic soils. So I got thinking, what's the difference? And my realization was the roots. With organic you have some weeds in the soil, weeds out in the field, it's part of it, and what emerges first in the spring, weeds. What dies last in the fall, weeds, and weeds have roots. I'm not saying weeds are what you want out there, but I'm focusing on the root characteristic of it. So that was the big difference. And so I wanted to be able to get roots out in my conventional farm soils longer into the season.

AQ:
Will you go do inter-seeding after this?

KH:

I'm going to check the field to see if I can, because we've got family coming in tomorrow and I've got 70 acres to get done here in the next day before the corn's too tall.

AQ:
If you had to say, main points of, you're a farmer who's never done cover crops, you're doing some pretty advanced work here. What do you think your neighbors think of all this?

KH:
The neighbors are very interested. They've talked to me about it and they said they're watching my fields close. They're very interested. I do some side dressing or split application nitrogen for them and they've talked about the cover crops. They let me do a couple trials on their farms just to see what they do. It's a new thing right now, but they all remember when they used to have alfalfa in the rotation and back when everybody had cows. They remember how good that corn was following that alfalfa, and that's because we've had roots in the soil for that long, living roots longer in the season. So they remember that, but they just want to figure out, find a way to get it done and be cost-effective. So they're closely watching and they like what I'm doing. So it's been very good to have their support.

AQ:
And is side dressing something that's done normally?

KH:
It's not very common. Most of the nitrogen is put all on in the spring, but every year it's been getting more and more common. We're looking at split applying that nitrogen; putting some on in the spring and putting the rest on in season, when that corn needs it. It's not a very common practice in this area.

AQ:
So what would you say of all the best management practices you're doing, just tell me what you're doing. You're doing split application, you're doing, would you consider it strip till?

KH:
No it's not strip till, so with my program, I have variable rates. My phosphorous and potassium fertilizer, and then I come and I put 50 percent of my nitrogen on in the spring and then I come and put the other 50 percent on in the middle of June, when the corn is actively growing, just to spread out that risk. I think we're going to have to get to that with, I think that's the way agriculture is going, we're going to have to watch our nitrogen management. There's different tools we're using; I think split application is one of them that can be very beneficial.

AQ:
What else are you doing?

KH:
After my field piece, I'm also planting a cover crop out on those, so I'm putting, I get chicken litter spread out there, so I put manure on my fields, I try to rotate about every five years for sure, to get manure on my land. And then I go and seed a cover crop out there to hold those nutrients that are out there and then I leave it. I don't do any fall tillage on that. I just let the radishes and the rye grass do the work for me. And that's been my best corn the following year, it's been very good.

AQ:
You're seeing some good results?

KH:
I've seen some very good results after the cover crop. I'm seeing an increase in corn yield the following year after the cover crop. The color is very deep, a deep green color, and last year after the cover crop, after the split apply in, I saw 25-bushel yield increase on those farms. So along with that, along with holding the nitrogen in the soil, and changing the soils around with the cover crop, it's been a no-brainer for me, I'm going to continue to do it.

AQ:
When I come back and be in touch with you, if we could just do the math after the 4th of July, I'll just try to figure out okay, he's saving this much on these many acres on input, on seed, on probably fuel, 'cause you're doing less passes?

KH:
It would be less fuel, yes, if I'm not doing fall tillage, correct.

AQ:
And so it would be interesting to put a little spreadsheet, less fuel, less time if you don't have to go and do the tillage, more effect for your labor so to speak, and then maybe you could recap what you got for your grants to help you fund it. So if you were going to say in general, financial savings that you see are just give me a couple sentences. A couple sentences on the economy.

KH:
So with the cover crop, I'm seeing my return on investment by reducing my tillage which will be about $20 per acre and that seed cost is $15. So I'm gaining about $5 there, or saving. And then with seeding

cover crops, there are grant opportunities as well as program opportunities through the NRCS, the National Resource Conservation Service, to be including cover crops into your rotation. So that's another source to look into to help finance your cover crop. But with my research, I'm trying to find a way to make it sustainable so we can plant cover crops without program payments, 'cause those aren't always a guarantee. So I wanted to be able to find a way to make these sustainable, that every farmer can plant cover crops efficiently and effectively.

KH: I just want to focus on these row units. This is what does the job here, so we've got where the nitrogen comes down and the seed comes out. And this is something, a farmer can just by this unit and then put a seeder on. They don't have to make anything, so that's why I'm focusing on…

KH: This right here is the one unit, so this is what's doing the work.

AQ: Tell me about this unit.

KH: The most important part of the uni-seeder is this new unit that I'm trying this year is that Yetter Magnum 10000. What I really like about this and why I'm running with it is I can siphon nitrogen and inter-seed cover crops at the same time. The colter opens up the soil and put the nitrogen four inches in the ground, underneath the soil. And behind that is a shark tooth closing wheel to

close the trench to seal the nitrogen in and behind it is a firming wheel to pack that trench down so we don't lose any of the nitrogen to the voltarization in the air. So when I'm inter-seeding cover crops with this unit, I've got my shark tooth wheel to stir the soil and a firming wheel for good seed to soil contact. So I've added a seed tube, tied to my Gandy air seeder that distributes the seed right behind the shark tooth wheel. So I'm getting that seed about a quarter to half inch in the ground, under the soil, and then firmed with the firming wheel. So I'm getting very good emergence and seed to soil contact with this unit. I'm at about an 85% emergence, which is excellent, and 100% success rate. It's getting in the soil and I'm having

radishes emerge in three days without a rain. So that's why I'm really liking this unit and this year I'm using 15 pounds of seed, last year I was at ten pounds of seed. And it's been about a $15 seed cost. So that's what's been excellent about this. I'm getting my stand high success rate and low seed cost. So that's why I think it's important to incorporate that seed into the soil.

AQ: Can other farmers get units like this?

KH: Any farmer can buy this unit. You don't have to do any assembly, just put it on a bar. I've done a lot of research with different pieces of equipment and I really like this, to be able to put the nitrogen on. So this is available to the public, to anybody who wants to get them through Yetter.

AQ: And you attach it to your regular…

KH: You can attach it to any tool bar. I used a Great Plains neutral pro bar 'cause it has fertilizer tanks on it, but you can put it on any tool bar and it'll work great. All you need to do is add an air seeder to put the seed out.

AQ: When you say that you're putting the seed in, you're inter-seeding the cover crop at the same time that you're putting the nitrogen in, are you applying urea or are you, is the nitrogen going in midsummer or spring?

KH: The nitrogen is going on midsummer, so when the corn is about a foot tall. And I'm using UAM 28%, so it's liquid nitrogen. And that's getting distributed into the soil and then the cover crop is getting broadcast on top.

AQ: Excellent, anything else that you think another young farmer wants to know about how in the world am I going to pay for that?

KH: I guess the big thing with this unit and how to pay for it is, being a young farmer, would maybe be doing some custom acres for some neighbors. There's a lot of people that don't have the time for it and adding a custom business and doing some for other farmers would help pay for it. And it would just be that niche, finding your niche.

AQ: Are you doing something like that?

KH: I am, I did about 1700 acres of custom nitrogen application for other farmers and then as well as myself. I did a little bit of custom inter-seeding. Guys are still getting their feet wet on it, just learning about it more, but as I inter-seed and side dress everything myself, but I do a majority of it is for other farmers. And that's what's helping pay for this unit as well as some of the grant work. So to a young farmer, just be resourceful.

AQ: Did you walk into your local NRCS office or your Sibley County, who did you work with locally?

KH: Locally I worked with Sibley and Nicolet County NRCS office with their Equip Program to get some funding and that's available to anybody. They're looking for more people to get acres on the ??? cover crops. So they are looking for people, so go in and check out those offices, your local NRCS office and ask them about the Equip Program with cover crops.

AQ: So what I was saying is I'm here because I needed to find someone who was doing cover crops. It doesn't seem like there's a lot of people in this area, or these counties nearby, that are doing it yet. What's your observation?

KH: There isn't a lot of farmers doing cover crops right now; it's very few. The reason a lot of the equipment, it's just starting to come out now for it and they're learning more research and learning how to get it done in South Central Minnesota. So very new practice, it's very new in this area, but it's growing.

AQ: Are they afraid of things like, I can't get a crop in until I get my harvest out? Is that a perception or misperception?

KH: Yeah, the biggest holdback is when to get it seeded. We don't have enough time after harvest to get a seed in, which is true. We do not have enough heat, so our option is in season. And that's such a new concept to get a hold of. We're so focused on we have to kill the weeds and keep clean fields and now we want to add this cover crop. So it's a new concept and that's why I'm doing the research I am.

AQ: How long do you think it's going to take before it spreads?

KH: That's a very hard question. We've got a lot of older farmers in the area and some remember doing it when they were younger. Their dads did cover cropping and now it's just a new concept to adapt, that's all, it's just something new. And the more information we can get out, the better.

AQ: You are so young and you're doing it. I think sometimes young people don't feel like they have a chance at doing something like this, that there's not a living to be made. So it's really kind of, I don't know, how do you feel about it? Do you feel like you're a rarity?

13:08.8

KH: The best thing that happened to me is I was able to have some of my own land to play with. My dad let me rent some of my own and he said, "This is yours, you experience it." And that's one of the things I wanted to try. So I had the freedom to do it and I think that's the holdback for a lot of young guys is maybe dad's not onboard so it doesn't happen. So the best thing that happened to me is just had a little bit of my own to try.

AQ: Tell me about your dad again. He's an organic farmer?

KH: Yes, he's certified organic, he's got horn ??? and beef cattle, cow ??? and then he raises oats and ??? hay to feed to the cows. He's been certified since '96, been in it a long time.

AQ: How did you choose, what is that crop, the one that's so yellow?

KH: That's barley.

AQ: How did you choose barley?

KH: I need it for my hog feed, so my hogs I feed a lot of ??? peas and barley, a little bit of corn, and flax, so I needed that for my feed. And then I bale the straw for bedding for the hogs.

KH: The field I'm going to go to now, it's tall corn, it's taller than what I normally like to inter-seed.

John McSweeney Interview
June, 2017
Farm: 250th Street, Henderson, MN (home in Belle Plaine)

AQ: Can you just simply say I'm John McSweeney?

JM: I'm John McSweeney.

AQ: And where you live.

JM: I live in Belle Plain, but I own this farm, it's a homestead farm my great-grandfather homesteaded.

AQ: When did that happen?

JM: Oh right **after the Civil War**. **They loved all the woods on it, that's why they were attracted to this. And just the land was somewhat of an Irish area** so they had all kinds of Irish neighbors.

AQ: So what part of Ireland are they from?

JM: They were from **County Cork** is where they emigrated from and then some of their wives were from Mayo and Lenster.

AQ: So this is how many generations?

JM: **I'm the fourth generation.**

AQ: Can you tell me just a little bit about them, (and by the way, I think my ancestors are from there also, County Cork, but I've never been there so it's on my bucket list). But anyways, can you tell me **a little bit about the history of this farm?**

2:23.5

JM: The history of the farm, well it's not much, **Edmond McSweeney and his brother Tom homesteaded the two 80-acre parcels and then if you improved on it, I think you could get another 80. And they, for immediate income, they harvested some of the timber and there was a sawmill that was on the corner of their property and so they harvested much of the original timber.** And then of course, they had **horses and cows and a few pigs,** but they survived**. The first crop they planted was wheat and rutabagas,** and **the rutabagas were ruined, they weren't any good, they were wormy. But the wheat was a** good crop.

AQ: What happened to the rutabagas?

JM: I don't know, but the rutabagas didn't turn out. The potatoes did, I forgot the potatoes**, they had some potatoes too.**

AQ: John do you have a wife, do you have kids?

3:50.4

JM: Sure, I have a wife and four children. **The four children and grandchildren are living in Minneapolis and they come out here frequently. This is part of their vacation or weekend. I have some walking trails out back over Highland Creek and through the property and the grandchildren of course like motorized vehicles, but they aren't old enough to appreciate walking and listening to nature.**

AQ: You have a lot of woods, so I bet you have a lot of birds?

4:33.2

JM: Oh yes, yes, it's **200 acres but there's only 67 tillable, so we had that seven-inch rain and some of the gullies moved right back into the edge of the fields. We didn't have a downpour like that for as long as I could remember, so I contacted the county and they were great to work with. Mrs. Sullivan and that whole crew up there, they came out and looked at the potential sites and laid it all out. It's really professional and checked out to be sure it was done right.**

And **I was very happy with Mark Melchuk, he built all of the structures on the farm, I have three of them. And I feel that he did an excellent job.**

AQ: So you were having a seven-inch rain and that was the impetus because what was happening when the rain came?

5:52:2

JM: Well there were, on the first structure there were one, two, three ravines right to the edge of the field and the big one was actually into a little bit of the field. **I mean it was amazing all the soil that moved with that seven-inch rain. And then the other one that they completed last year, there were approximately six different spots where it was, there were little ravines moving into the field, plus one big one. And they built the structure, they ran a tile line to an intake and the big drain pipe down to the very bottom of the ravine, and it's working extremely well. I at first didn't think the tile line would take, if we had a big rain, would take the water away, but it does, so I'm very happy with it.**

AQ: So, just so I can understand fundamentally, generally in layman's terms, what they did is, did they put tile under the field or was there already tile?

JM: No, **right along the edge of the containment structure, with an intake at the lowest point. They county surveyed all that; they had all that figured out and so the tile line is right along the edge of the containment facility or structure.**

AQ: So this is an edge-of-field practice that keeps the water or dispenses the water, depending on what the need is correct?

7:43.2

JM: **Well the water runs right down to that intake and right under the containment structure and right down to the bottom of the ravine.** I'll show it to you later if you like. But I don't know, it's approximately a 30-foot or 25-foot piece of pipe that goes right down to the bottom of the ravine.

AQ: And **did you know to call the county right away or how did that go for you? Had you ever called them or worked with them before?**

8:16.7

JM: Oh yes, on other things, but **they send out a letter. They communicate well with you, they sent a newsletter saying this was available.**

AQ: Because I imagine that this is, I don't imagine, I've been told that this is highly… and that this situation happens a lot in this part of the county because of the way the watershed drains.

JM: Well **the closer you get to the Minnesota River there are more ravines you're going to have.**

AQ: So if you had to describe your ravines, how tall are they?

9:02.8

JM: Well the house we're in I think is at 984 feet in elevation right now and parts of the farm are higher, I would say 20 feet higher. And then High Island Creek runs through it and so the water, **all the water on the farm goes to High Island Creek and down to the Minnesota River and off to New Orleans.**

AQ: So what is on the 67 acres of tillable?

JM: Oh **it's alternated corn one year, soybeans the next.**

9:46.2

AQ: Have you done any of the, I'm just curious 'cause they're talking about it a lot now, cover crops?

JM: Well **I applied to put it all in CRP, but because of the soil type, there was only two fields that would get the top payment and then there was another field that would get a reduced payment. But the reason I didn't go into it was there was an 18-acre parcel near High Island Creek and they told me I'd have to plant trees on it. Well, that didn't appeal to me to plant trees and then what are you going to do with it after 15 years or 10 years. Am I going to go in and pull out all the trees?**

AQ: Is it a parcel that's connected to the rest of your fields or separate?

10:50.3

JM: No, not at all, it's **at a much lower elevation. It's right near Highland Creek. In fact, I'm going to have to put in filter strips on a few inches of the field. I just got the notification from the county this spring and I have until I think the end of November to put the filter strips in, which is a good thing, clean up the water.**

AQ: What will you put in?

JM: Well I don't know, I talked to a neighbor who we were going to work at it together and rent a drill or maybe the county has a drill, I don't know. We haven't really dug into that. That's my phone, should I answer it? I cannot get rid of those credit card calls.

12:03.3

AQ: Do you have a block caller function on your phone? You could block the number that just called you. If you want me to teach you how to block who just called you, I can teach you that.

JM: Oh sure, I'd love it. Get over here.

0045

2:33.8

AQ: Okay, pretend we never talked and you're going to tell me in a couple sentences why I'm here because of, if I'm someone interested in some of the concerns of a farmer and a landowner, holding onto land and doing the right thing with water and all that stuff, and you've had some work done over the years, pretend we've never talked and just tell me as if this is the first time I'm hearing it.

JM: Well I mean tell me why I was interested in putting the structures in?

AQ: First tell me what you did.

3:12.0

JM: Oh well, three years ago, no it'll be **four years ago, I contacted the county and they sent a young woman who works for the same department, April Sullivan is in charge of it.** And they were all very helpful and **she came down and looked at it and said it would qualify. She looked at these washouts that were close to the field and she said I'd have to send, she helped me fill out an application.** And then they approved it and then they surveyed, a surveyor came out. I forgot his name, from Nicolet, **but they surveyed and got the topography, the layouts of where the water would run. And the first facility, they went right around the headland of a ravine that had one, two, three, four little ravines coming in, two big ones and two little ones, approaching the field. And so when the crop was off, then MarK Elcher, the contractor came out. He had the plans from the county and all the elevations.** And then the people from the, is it the ASCS office? Anyway, they came out and made sure it was done right, while Mark was putting it in and **there's one big ravine and they put that big tube of plastic right down to the bottom of the ravine and the water running off the field goes to a catch spot, the lowest spot of course. And then on that particular one, there's a little bit lower spot, so if we have a seven-inch downpour again, and it's too much for the catch basin to handle, it will flow over the containment facility on that low spot. That's the only one they've done that way. And it was completed four years ago and then later on a man came and seeded it and right now it's got all kinds of grass on it and it's working very well.**

AQ: When you say that was the only one that was done that way, how were the other ones done differently?

5:56.3

JM: **The other ones have tiles, a tile line right at the face of the water containment structure. And so when the water runs down and it's stopped by the containment structure, some of it will go down into the ground to the tile line and some of it will accumulate because it's at the lowest spot always for the intake. It's an orange pipe coming up, it has holes in it and the water pours down under the containment facility, into the big pipe going to the bottom of the ravine and it's good by erosion.**

AQ: I bet it is, **so it probably does at least two things. One, protect your fields and two, stabilize the ravine?**

6:45.4

JM: Yes, you got it. So I was so happy with the first one, I applied for a second one and it was the same thing. They came out and that's the shared one with my neighbor because our fields join and we went together on that one and that one was done two years ago. And it's the same system except that doesn't have a low spot to take care of an overflow of downpour, it just has the tile line running along the face of the containment structure and into the tile and here again in a pipe all the way to the bottom of the ravine. And then **the one last year was quite long. It was all along the ravine that had almost seven washouts, two of them very close to the field. One was right at the edge of it. And so they approved it. Here again, the people from the, April Sullivan's group came out and they did a great job. It works very well and the same with last year's. They just completed it and it's seeded and it's working the same as the others, very well.**

AQ: Seven washouts, is that more than usual?

8:19.9

JM: Well **I don't know when they ever got a seven-inch rain in 15 or 20 minutes at any time in the past. I supposed it happened maybe when the whole farm was covered with woods and you wouldn't have the runoff like then. But possibly because of all the ravines.**

AQ: So is that when Joel Wersher came out, the last time around? He told me that he's only been involved recently.

JM: He's with the state, yes, because on the last one the state also participated.

AQ: I'm sorry, he's with Sibley County, so he's an SWCD.

JM: Well maybe it wasn't Wersher. There was a, I forgot her name, he was from Lonsdale and she was on the staff there. She did most of the legwork, but she's gone on to a different job now.

AQ: Okay, well it sounds like you're super pleased and that's been very effective. **How about the financing of it all? How does it work?**

9:30.0

JM: **It works great. The federal government pays, oh I forget, it seems to me they paid almost 70% on the last one. I think it was a $16,000 job and I think I paid maybe six or 7,000. That one, the last one, the federal government and the state participated in it which further reduced the cost. And then you give them a copy of your check and they deposit the money right into your checking account. Then you have to pay taxes on it, but so what. It's still a wonderful deal, a great deal. I wrote a letter to April Sullivan telling her how happy I was.**

AQ: **Is it something your other neighbors want to maybe think about doing?**

JM: Yes, my neighbor, John Dace, he just put in another one after he saw what I did. That was just completed last fall.

AQ: So is he learning about how to do it financially and pragmatically from you, and then he realizes that there are resources are out there or did he always know about it?

10:59.6

JM: Well he drives across the new containment facility to get to his field. He has to drive through my farm to get to his. But we've been neighbors for years.

AQ: **Is it needed a lot all along this way? Ravine stabilization control structures?**

JM: Oh sure, but for this farm we've got the three major ones. And then it comes down to funding. Now Trump cut back on agriculture so who knows what, he whacked a big chunk out of agriculture so who knows. I'll have to call Trump and straighten him out.

AQ: Let me be on that call when you make that call.

JM: Well I tell you what, he likes to use these kind of words, I'll say this is a loser program and it's dumb.

12:34.9

AQ: Okay let's go take a look. Can I, just for the sake of, you just stay there for one second. I want to ask you, we talked **about you're the fourth generation. What happens after you? Do you keep it in the family or what happens to the land?**

JM: You mean when I die? That's probably within the next ten years. Well I think **one of my sons is going to buy the farm. It's 200 acres with the wildlife, deer, wild turkeys and there are a few pheasants. And he loves all these trails.** The only drawback is we'll have to come up with some kind of a bridge across High Island Creek because a lot of the land is across the creek. And I have to circle all around and go through a neighbor's property to get to the back end of my farm. There's almost 45 or 50 acres on the other side of the creek, or even more. I never really thought about how many acres are there.

AQ: So he wants to keep it in the family.

14:12.7

JM: He does. Well this is 54 miles from where he lives and **they really enjoy coming out here. And his kids like that Kaboto for just driving around, but he likes just walking around in it and enjoying it.**

AQ: I think there's nothing better for kids, but also adults, to be in the outdoors like this. I'm a huge proponent of it.

17:28.5

JM: That old chicken house isn't very pretty, don't photograph that.

AQ: Oh I love it, it's historic.

JM: I'm going to tear it down.

AQ: Oh you're kidding, isn't that the homestead?

JM: That was my mother's chicken house.

17:49.7

AQ: You're going to take it down?

JM: Now it's the local schoolhouse was on our property and we moved it down from the middle of the field up here.

AQ: The chicken house?

JM: District 42 I think it was in Sibley County.

AQ: This building here that's the chicken house was the schoolhouse.

JM: The schoolhouse was built before I was here.

18:25.2
AQ: Which building is the schoolhouse?

JM: The bigger one with the green roof. It looks like a schoolhouse, country schoolhouse.

AQ: And **you moved it here, onto the property?**

JM: Yes, it was along the road in the middle of a field. My grandfather had deeded the property to the school district on the condition that if school ever stopped, the property would come back to the farm.

AQ: And so school stopped and so the property…

19:01.6
JM: School stopped in 1943 and they had consolidation and we joined the Arlington School District and the school closed. And so my dad hired a mover and he moved it down to the spot where you'll see it.

AQ: Can I get a shot of you standing here? Is that your field across the way? It is? Okay, can I get a shot of you standing here and then I'm going to get it. I'm also interested in just people. It's nice that you're doing the right thing for your land and I'll get the story, I promise.

20.15.7
JM: Well I'll comb my hair.

AQ: Comb your hair?

JM: Well I was out in the wind. I guess it looks alright.

AQ: I would say so. So just act like you're waiting for Anne to finally get here.
222:37.1
AQ: **Did you put all those trees in there?**

JM: I did, I blended all those arbor vines and all those trees.

AQ: That's a lot of work.

24:01.4
AQ: Which is the son that'll probably buy it from you?

JM: He isn't on there.

AQ: This is the whole family?

JM: Well not all of them but a good bit of them.

26:50.0

AQ: Oh this is the next generation—are these the grandkids?

JM: Well you've got that here, **this is the next generation.**

Greg Entinger Interview – Strip Till and Split App
New Prague, MN
Referred by Mike Schultz of Le Sueur County
June 17, 2017

0026

AQ: Hi Greg, can you just talk to me a little bit and let's see what it sounds like. Just tell us what you're doing today.

GE: Oh well, that's my house right there.

AQ: Oh the white one?

GE: Nope, in this woods here you can't even see my house, with the trees.

AQ: Oh, nice, so it's nice and cool, lovely.

21.3

GE: If there were no leaves on the trees, then you could see my house.

AQ: It's good for the summer and it's good for privacy, what else? Now we're going to test Greg's voice. That was on his steering wheel, now we're going to put it behind my chair. Okay Greg, so tell us how you're turning the wheels.

44:1

GE: I am mainly turning the wheels as soon as I get close in close to the line, I press a button. So I will steer and this tractor takes over and I can release the steering wheel.

AQ: So tell us about the process that's happening now, precision farming.

GE: Precision farming, the accuracy, providing the placements, ???, the same thing goes with the planting of the seed where you want the even number of spacing.

0027

AQ: I'm going to be taking shots of you, but that's okay.

GE: I'll hold it low.

AQ: Yeah, hold it low. I'm going to try it this way at first. This is cool.

2:13.9

GE: You know, a lot of technology comes from the farm into cars, because the temperature, individual temperature gauges, that was on a tractor before a car.

AQ: Oh was it? Wow.

GE: Auto steer has been in tractors for 20 years now.

GE: **Now with gray strips, or the grayish strips you see, that was ??? that was put on in the fall of the year.**

AQ: What was?

3:29.5

GE: **In the grayish strips, that was P and K that was put down in the fall of the year, and now we're coming back with nitrogen. I did some trials last year where I put 100% P and K and nitrogen down and I lost the nitrogen, and now this is why…**

AQ: Tell me again, you did some trials.

GE: I did some trials last fall. One trial was I put P and K and urea down in the fall of the year and came back in the spring and just planted it to **???. Another test that I did was similar to what we're doing now, put P and K down in the fall, came back in the spring and put the urea down. Another test I did was I put 100% of the product down in the spring, P and K and urea.**

AQ: And what do those things do, P and K and urea?

4:32:6

GE: P and K feeds the plants. You need the potassium and nitrogen. Urea is nitrogen, it's a dry ???? form. Another source was nitrous ammonia, those are in the big white tanks that you see ??? all across the fields, that's in the liquid state. It's just another form of nitrogen that a ??? can use.

AQ: So anhydrous ammonia is a form of nitrogen?

GE: Yes, it is.

AQ: Do you use it?

5:11.7

GE: **We used to until I started adapting this technique with strip farming.** It's who you listen to and who you believe. Some people say that we anhydrous is harmful to the soil, not to the soil, more of the organic organisms of the soil, like the worms and other bacteria that are in the soil.

AQ: So let's talk about the general story, tell me again, your father passed away in 2012, start it from there and tell me how you…

6:10.4

GE: **Like you said, my father passed away 2012, so in '13 was my first year farming and in '13 we had tremendous amounts of rain. We have five inches in 45 minutes of rain and I was in full tillage at the time where I ripped the soil in the fall of the year and then came back in the spring and ????. When you ??? it works up the top 3, 4, 5 inches of soil, that's all loose soil. So when those heavy rains came, that topsoil, that loose soil that I just worked up and planted into, from the surface it washed down the hillsides. As water channeled, it created deeper washouts. I had washouts three feet wide by two feet deep and all that ??? down in the low grounds. So losing my topsoil, losing my organic matter and so forth. '14 came along, I repaired all those washouts, '14 came along we just had a little, probably about two inches less of rain over the whole period, but the rain events were bigger and what I repaired all washed back out again. At that point I decided I needed to do something.**

AQ: Because you were tired of losing your soil.

7:45.9

GE: **I was tired of losing my soil. My neighbors were getting my black dirt, my neighbors were getting my fertilizer that I applied and so forth. So it was very difficult and I started my research, I started talking to other farmers, I looked at no-till, I looked at strip tilling, I looked at ridge filling, those are all conservational till practices. I just didn't feel comfortable with the no-till. I liked a little bit of loosening up that soil, I liked putting my fertilizer in the ground. With no-till, you spread fertilizer, it's on top. In my eyes, if I get a heavy rain event, it's going to wash out. So I talked to other farmers, the closest farmer to me is in Northville or Cleveland; I spoke to them numerous times. I talked with my soil and water guys, I talked with the USDA office down on Center, we were able to draw up a plan.**

9:02.6

AQ: You came up with a plan?

GE: Yep, **came up with a plan. I went through the USDA office and got what they call a Conservation Stewardship Program.**

AQ: CSP?

GE: **CSP, which by electing to do certain practices, I was awarded grant money. One of the items is strip tilling, so as many acres as I got in the program and getting paid on those acres, another CSP program that I elected to do was leaving standing grounds for wildlife.**

AQ: After your research, tell me how you introduced CSP.

11:03.0

GE: **I went to the USDA office, my local branch, I started questioning them what kind of systems were out there for making this transition. It's a big transition, it's a big expense. They presented to me and another farmer as well the CSP program, that's the Conservational Stewardship Program. I elected to do certain practices, There was funds available to help me out to make the transition. One thing was the strip tilling. Strip tilling is one of the packages that I selected to do. Other one was leaving standing crops for wildlife for the winter feedings. Another one was for low drip while spraying. That included nozzles, different pressures and so forth. There's another one, I can't remember it right now. Oh, nitrate testing. That was something new to me as well.**

AQ: When you're done with this field, are we done?

GE: No.

AQ: Because I've got to get shots of you outside, where will that happen?

12:32.4

GE: I've got another field. I probably will go to the ones in the head lands, because I don't want to do ??? I think it's a little more concentration.

AQ: What's that.

GE: The head lands, the ends of the fields.

AQ: I love your laugh, it's so great. I love to work with people who laugh.

GE: Life is too short not to laugh.

AQ: I know it, no kidding.

13:23.0

AQ: So you looked at a number of CSP programs and were just about to tell me about the nitrate one.

GE: Yes, that is testing, going out in the fields and testing; we call it the **basal stock test.** We do that in the fall of the year, when the corn is just above the black layer, which means it's cutting off the supply of food or water to the kernel of the corn. At that point there, you take a couple tops, you send it in, they report back. And it's telling me how much nitrogen is left in that plant. If there is any or short on nitrogren, too heavy on nitrogen, which means I'm over applying nitrogen**. So it's a good example of looking at my different soils and figuring out if I'm over applying fertilizer or maybe all I need is to apply half the rate, which could actually save me**

money in the long run. And that's the big ticket right now, is making money and how I can save money.

14:43.8

AQ: Let's talk money. Let me just get a few shots here. I don't want to miss some of the art.

GE: **The rolling hills. I call it the Hills of LeSueur County. Because you go five miles to the west and it's flat, or it's flatter, not as rolling as here.**

AQ: It is really? Thanks for your patience.

GE: No that's fine, I'm moving, that's all that matters to me.

0028

AQ: Okay so Greg, in really simple layman's terms, basically, once you realized you're getting washed out, you were losing your soil, you did a lot of research and you decided that what you're doing now is decidedly best for you.

GE: Yes.

AQ: So can you take it from there?

1:22.7

GE: Yes**. Everyone is different, everyone makes their own decisions. Some people the no-till is probably the best option for them. With the strip tilling there was the cost of the ??? and I still owned all my conventional tilling, but I really felt like the strip tilling was the best for me and my ground. I had some clay ground, I had some black ground, I farm a little bit of sand ground. This adapted to all my ground types or soil types.**

AQ: Okay, what is it, what's strip tilling?

2:05.6

GE: **Strip tilling is, I am making a band, a strip, a band in the field. That strip is about six to eight inches wide, about six to eight inches deep. Now I have these bands or strips every 30 inches, so in between the six-inch strips is untouched soil. That soil is going to be laying or staying intact for the remaining of the year. And as you can see here, more prevalent than the corn stubble, I am in between the root balls of the previous year crop. This year we're filling now with soybeans. I still have the soybean stubble intact, in the ground, right now today, and I am stripping in between those rows. What that is doing is leaving that wood pile there, over winter, which is holding that soil so any kind of runoff during the spring, that wood pile will hold that soil intact. Throughout the year if that's the case, it's putting the organic matter back into my ground. The tract above that I'm leaving from the previous year crop is starting to create the topsoil back again that I lost. So when you turn your soil over with conventional tillage, you're mixing that topsoil or that organic matter in the top 12 inches of ground. I'm leaving it on top so I can start building my topsoil again. The other thing that the root systems do as they decay, they become earthworm channels for the earthworm to come up to the top of the soil and grab my tracts and ??? and bring that down as they feed and ??? It also creates a natural waterway for when the heavy rains come. Instead of sitting on top of the soil,**

they're going to start imprinting down, using those root systems that have decayed away. Does that make sense?

4:42.6

AQ: It does make sense. So in essence, the top layer of the soil has to compact and when you don't till all of it, regularly and frequently, it gives it a chance for the organic matter to start to have some probiolactive needs. And if you leave the corn stover or the soybean roots from the previous year's harvest in the ground, as those roots decompose, that helps break up some of the compactness.

5:33.7

GE: **As roots drive deep or drive down, that's where cover crops really come into play. Annual rye grass has deep roots. As you plant that cover crop in the fall of the year or even during the mid-summer, ??? applications, if you get that annual rye grass to grow, it's creating that root system down below underground. The other benefit of the cover crop, and I have not done cover crops yet, I am seriously looking into it, as the cover crops, what's on top of the ground, when you kill that off, you're building more ??? matter, because that trash stays there. It's like a woods here. You go through that woods and you look at that soil, that soil is so black, but the leaves fall from the tree every fall of the year, the trees are falling over and never get harvested. As they decay, that all becomes that black topsoil in a woods. That's what we need to get back in our fields and how do you do that? We leave our tract up on top, let that decay and become that black earth soil again that we all lost. That make sense?**

7::04.2

AQ: Yeah, it does.

GE: You like that we're out in the woods.

AQ: Well you know, it's all connected.

GE: It is.

7:24.4

AQ: Mother Nature has taught us a lot over the years, that's really what you're talking about, getting back into a more natural cycle.

GE: Yep.

AQ: And giving the earth a chance to…actually the symmetry and the lines are beautiful aren't they? They really are.

GE: You're with me for a while right?

AQ: Yeah, no, I'm totally flexible.

9::21.1

GE: Okay because this right here took me about an hour-and-a-half, so I'm going to drift to another part of the field, that'll be another hour-and-a-half, is that okay with you?

AQ: Yeah, can I run out and get a picture of you approaching this part? Do you mind? I'm going to run ahead of you and then get situated and take as long as you can before you have to start again.

GE: Give me a wave.

AQ: Alright I will.

23:07.1

AQ: You didn't have to do that.

GE: I've got to go to another field.

AQ: Okay, perfect timing; that was nice, good stuff. Nice field, did we screw anything up for the photos?

GE: No, oh maybe.

0029

AQ: Look how pretty it gets. You don't have to, well, if you don't mind.

GE: This is a smart tractor; it runs itself down.

AQ: How did that go?

GE: Good, really good.

AQ: **What do your neighbors think of all this?**

1:38.1

GE: Some of them think I'm crazy.

AQ: Tell me about that.

GE: I've spoken to my landlords about what I want to do and how I'm doing it and my landlords I rent from can be very positive. I tell my landlords that they're very positive, but some of the other farmers in the area think that it'll never work and I'm proving them wrong.

AQ: Say that again.

2:22.1

GE: **Some of the farmers in the area, they'll say it'll never work. On the wet years it'll never work, on the dry years it'll never work. So I'm just going to have to prove them wrong and make it work. So I think I have so far.**

AQ: What can you point to to say it's working?

2:46.1

GE: **I'm achieving the same yields that I did previously with my full till by doing this minimum tilling. I'm saving on fuel because in my old four-wheel drive tractor, it would take me 2-1/2 gallons per acre on ripping the field and I'd come back and cultivate and it'd take a gallon-and-a-half, so three-and-a-half, four-and-a-half gallons of fuel, depending on how tight the soil is to about a gallon per acre. So at $3.00 a gallon, I'm spending $3.00 an acre versus $9 to $12 per acre. So I'm saving money there.**

AQ: What are you going to do now?

GE: I'm going to go straight.

AQ: So your neighbors don't do it this way do they?

4:37.4

GE: No.

AQ: Are you one of the first?

GE: **I am the first in this area to do this. I have to go probably 15 miles, 20 miles to the east or to the west to get to the closest farmer that's doing this. So there's not that many of us out there that are doing this. I mean 15 miles is a lot of acres between here and there.**

AQ: How did you put it into play, did you talk to Soil and Water?

5:26.2

GE: **With Soil and Water, working with the USDA about this and really making this decision to do it and figuring out how to do it, talking with a banker and proving to him that I need to make this change for me to keep on farming; that was a huge thing. How can I prove to a bank to lend me $100,000 to a piece of the equipment that I've never ran before and that very few in this area have ran before. This technology's been around for 50 years, strip tilling.**

AQ: What's going on?

7:25.9

GE: I hit a wet spot and I plugged up the machine, so I've got to go out and unplug it urgently.

GE: We should be heading back and emptying out the truck.

GE: Yeah, leave it, leave it there, yeah, see what it does.

Becky Pollack Interview
Exec. Director of Ney Nature Center
Henderson, MN
June 20, 2017
(Referred by Mike Schultz of Le Sueur County)

Becky: (Continues her story and history as a student discovering the deformed frogs found near the Ney Nature Center)
So like even the day of my graduation and I'm in my graduation dress out in the pond picking up buckets of water and taking them down to our school classroom, my mom was not happy. But she didn't quite understand what I was doing either. And as a project-based school, it was very easy for us to be able to take on those projects or take on those roles to help with the research that was going on here.

AQ: And so in the end you found that there were very deformed frogs living in the pond, you sent it in to the scientists nationally or federally?

38:0
Becky: We started with the state; we started with local, the Minnesota Pollution Control Agency scientists. We worked very closely with Judy Helgen who is retired now from the Minnesota Pollution Control Agency, and she just actually, we used her book about the whole project maybe two years ago.

AQ: And it went down the line to legislation or what happened?

Becky: So for the Minnesota Pollution Control Agency to work on these projects, they needed funding, state funding, and so we spent time up at the capitol lobbying for this project that we wanted to see it funded. We wanted to know what was happening with these frogs and our environment. And frogs weren't just found in our pond. Once the media picked up on it and it got the press, people looked in their own backyards for deformed frogs and frogs were found deformed all over the state, all over the United States and then also in other countries. And locally, some of

1:31:3

those deformities were attributed to local environmental problems. Deformed frogs in the Russia area was nuclear fallout. It was pretty easy for them to conclude that. And there were deformed frogs in California that were attributed to a nebotoad or a parasite, but we don't have that parasite here in Minnesota. So all sorts of theories, but a conclusion here in Minnesota was never obtained because the funding was cut off.

AQ: So **you were doing water quality work in your high school days and now you are the director of the Ney Nature Center and you're still dealing with water in a lot of ways I would imagine.**

Becky: Yeah.

2:17.1

AQ: But if you could talk about one of the ways is more frequent - more frequent rains and precipitations and/or flooding or high flow rates here, and if so, maybe we'll talk about that not as a person, as a wife or a mother, but a person teaching environmental programs here at the Nature Center – In your Ney Nature Center role, what do you see when a) what is happening with flooding here, and b) how does that impact nature?

Becky: So **we are seeing more significant rain events** and as far as nature is concerned…so we are seeing more significant rain events **and more significant flooding on the Minnesota River. When we watch the river levels, and we watch it because we live and work on opposite sides of the Minnesota River and so to cross the Minnesota River to get from places that I work, the schools**

3:47.1

that my kids go to and things like that, we watch the river levels in the respect that if the river closes or the floodgates close to get into town, we could be marooned on either side based on that. it's also when the flood gates close and the roads close, it impacts the people or the school groups that are coming here to the nature center where I teach environmental education. So when I have to reroute buses all the way around, it comes at significant cost to some of those schools.

AQ: So it's like just operating, **just having general operations as an organization in the Town of Henderson is impacted with more flooding these days.**

4:30.0

Becky: Right, yes, exactly. When we're hosting weddings out here, same thing. If the river's going to rise and the road's going to close, those wedding participants need to know how they can get to our venue or from our venue to the one in town maybe where they're hosting the reception or

whatnot. And so we just want to**, we're always conscious of what the river's doing and how we can make sure that people can get from one place to another here locally.**

AQ: **What do kids learn about nature when flows increase and levels rise?** How does that impact the ecosystem or does it not?

5:03.1

Becky: Well **I think it impacts the ecosystem when water can move a significant amount of soil. And here along the bluffs we're all glacial till so when you get huge amounts of rainfall and a hillside starts to slide down, that changes the landscape as they know it, it changes the plant communities that are growing there, it tends to create spaces where maybe plants that are undesirable come in because some of the hillside has moved off.** And so we watch for the conservation issues of how can we watch and manage our land based on the natural plants and animals that are supposed to be here.

AQ: What happens **when erosion happens?**

Becky: Well when erosion happens, yeah again**, the disturbance plants come in, those undesirables, they're not native and they don't create good habitat**. And **here at the nature center, we're a nature preserve, so our mission is to preserve this land for nature** and then to educate based on that.

6:01.3

AQ: So not only do you educate the kids and do they learn about Mother Nature itself and ecological systems, but they also learn how it interplays with other outside events or when Mother Nature changes like the, I know a lot of people won't call that climate change, but for whatever reason that you're getting more flooding and more precipitation, the kids are learning that too?

Becky: Right, and also maybe **what impact their use of our resources has on those changes, whether that's the increase in climate change that's creating those rainfalls, or whether it's just the use of the land that creates more runoff and when we have more rain coming, it intensifies that erosion.**

6:55.5

AQ: Okay, and then you were telling me, just personally, **as someone who lives here in Henderson, what is like to be a working mom and wife and just day-to-day life when you have more increased flooding?**

Becky: Yeah, so **we are seeing more flooding here in Henderson and on a day-to-day basis, especially when the river is rising, it's a little bit nerve-wracking. I spend time watching or trying to predict out there when the water's going to raise high enough to close the roads that I use so that I'm not in some way separated from my children or have to do some giant drive around** in a detour to get them from school or to catch them in the bus and what not.

7:40.5

AQ: Have you guys had to put **more money into your infrastructure** as a result, like stronger bridges or higher roads.

Becky: Yeah, so currently the City of Henderson is working with MNDOT on **a flood mitigation project where they really are trying to find the best route to hopefully lobby for some dollars to raise the roadbeds. There's three entrances and exits into Henderson that will close during a flood, leaving only one way in and out of town and that's to the west.** And so of those three, which is to the north, to the east and to the south, **which would be the best route to put money into to try and keep open during flood year events**.

AQ: What would they have to do?

NOTE: HERE IS THE FEASIBILITY STUDY RESULTS THAT BECKY IS REFERENCING, A FLOOD MITIGATION PROJECT PARTNERED WITH THE CITY OF HENDERSON AND THE DEPT OF TRANSPORTATION: http://www.dot.state.mn.us/d7/projects/hwy19study/

8:24.4

Becky: Well to the south they'd have to raise the roadbed at least eight feet and by doing that, it impacts the water level, so then they also have to find someplace else to scour out the valley a little bit to make sure that that river level stays the same during that flooding event. Does that make sense? Anything that they do that might cause higher water levels, they have to mitigate by finding someplace else to keep the water level down. So for instance, if they were to choose that south route and raise the roadbed on Highway 93 eight feet, they would lower the roadbed on Highway 19 so it would flood sooner**. So the other option on Highway 19, which personally I think is the best option, but it would bridge from the Henderson levee all the way across the river channel of course and also most of the flood plain till you get to the railroad bridge, which**

9:19.5

naturally would alleviate some of the flooding because it allows the water to go under that full length of the bridge where right now the roadbed somewhat acts as dam, damming the water up a bit. But that's the most costly project of course, so they're predicting that one to cost about $40,000,000.

AQ: Is there anything else that can be done by us humans right now? Are there things that can slow this water?

9:49.3

Becky: **I think as individuals we can make sure that we're creating buffers and things that hold the water out in the landscape as opposed to just rushing it off the land and into the river and ravine channels. So anything you can do to just slow the water down to create less erosion, I think would be the best route for all of us as individuals when we look at how we're manipulating our landscape. If we can slow the water down, create less erosion, hold the water up in the upper lands before it rushes through into our valleys and into our ravines.**

10:32.2

AQ: And what's the best way to reach hardworking farmers who are challenged with many things right now on not just knowledge of how to do that, but from a practical standpoint, financially do it and tactically do it and logistically do it? Isn't there a lot at hand for a farmer, do you think it takes a village kind of approach?

Becky: Yeah, **I really do think it takes a village approach and I think the farmers want to be conscious of their land use and they want to be able to not create environmental problems, but they're limited too in their resources and their livelihoods.** And so if we can all support them with projects, support them on local levels, support local farming, I think that really helps them.

11:30.2

AQ: And personally, did you say your husband has been impacted by his own workload because of the recent rains and floods?

Becky: Yeah so a couple of years ago, my husband worked for the City of Henderson and he was the one and only streets and parks person in Henderson. And so when the levees closed, you call in the local fire department, all the volunteers, you have big machinery to close those levees and with only one way in and out of the town in the opposite direction from where we live, he spends long hours before he takes time to just drive around, so when Henderson closed this last time with the mudslides and a lot of cleanup within the city, and the levee itself needs to be monitored when the flood is happening, you don't want anything to breach that levee because that's all that's protecting the town from that high water, it's a little bit of a nerve-wracking work and he took that very seriously and spent a lot of time working on that.

12:29.8

AQ: Did you say **FEMA got involved**?

Becky: Yeah, I'm not entirely sure all the extents that **FEMA** comes in; they come in I think at the end with funds. I know that this last time they did call in the **National Guard** and that helped to monitor the levee, when the river reached its highest point. That was 2010. I should go back and look at that.

AQ: I wasn't sure if you were going to say 2012 or not. Some people are talking about floods in 2012.

13:30.8

Becky: One of them was the highest yet. Did you look at some of what I sent you 'cause it's got the **coolest chart of high floods and how it impacts the two roads**. And **it shows the frequency of the floods in the last 25 years compared to the whole time span that they've been recording the river levels.**

http://www.dot.state.mn.us/d7/projects/hwy19study/

Becky: Because they're really doing this study right now in Henderson and this is a big deal, the mayor and some of the city councilmen would have a lot of information about how the town is impacted. If you want to be in touch with all of them I'm happy to make that connection.

14:06.8

AQ: This particular project is for the Lower Minnesota River Watershed and they have this process, MPCA does, it's called WRAPS and I believe the acronym is Watershed Restoration And Protection Strategy and they take a look at everything, including GIS, like where are the greatest

needs, where are the greatest problems, what are the attitudes about conservation practices, all those things, socio, cultural, financial. I don't know that they look at finance, but the farmers sure think about it and they have to and so do people like the mayor of Henderson. And it seems like more and more, you can't say, there is no divide anymore. You can't say it's just an urban concern or rural concern 'cause these ditches are all connected. We're all working on the same water here and eventually one ripple effect connects to the next one.

Becky: The other resource that you may be very interested in, there's a local naturalist couple, Art and Barb Straub, their fabulous and they have all their journals.

Anne: Yes, I know Art and Barb Straub and interviewed them for Voices of the River a few years ago. They've done wonderful work.
http://www.queenanproductions.com/voices/2012/07/24/straub/

Lower Minnesota Watershed Wraps CE South

The purpose of this project is to identify community/landowner opportunities, obstacles, and opinions on land management and water quality in the rural portion Lower Minnesota River Watershed. Ultimately, this work helped identify land management options for the purposes of surface water quality restoration and protection within the Lower Minnesota River Watershed. LeSueur County sponsored this project and subcontracted with LeSueur SWCD. The findings from this project were used to inform the development of the watershed restoration and protection strategies (WRAPS) report within the Lower Minnesota River Watershed. Preliminary meetings with local partners determined that basic level public participation (education, outreach, survey input and interviews) was appropriate for this project. Public participation focused on coordinated education and outreach events focused on BMPS and water quality issues specific to the watershed, a mail surveys and interviews focused on BMP implementation. Contract participants also gathered, compiled and analyzed information from the interactions (surveys, interviews and outreach events). The project encouraged team building of different LGUs so that strategies can be developed for WRAPS watershed wide and unique to the LGUs in Rice and LeSueur county areas of the Lower Minnesota River Watershed.

Lower Minnesota River South Watershed Restoration and Protection Strategy Development Final Progress Report

Le Sueur County in partnership with:

Le Sueur Soil and Water Conservation District

Rice County

Rice Soil and Water Conservation District

Minnesota Pollution Control Agency

Table of Contents

1. Grant project summary

Project title: Lower Minnesota Watershed Wraps CE South

Organization (Grantee): Le Sueur County Environmental Services

Project start date: 9/20/2016 Project end date: 8/30/2018 Report submittal date: 9/18/2018

Grantee contact name: Joshua Mankowski Title: Planning and Zoning Administrator

Address: 515 South Maple Ave

City: Le Center State: MN Zip: 56057

Phone number: 507-357-8540 Fax: 507-357-8541 Email: jmankowski@co.le-sueur.mn.us

Basin (Red, Minnesota, St. Croix, etc.)
/Watershed & 8 digit HUC:: Minnesota 07020012 County: Le Sueur

Project type (check one):

- ☐ Clean Water Partnership
- ☒ Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
- ☐ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL/WRAPS Implementation

1.1 Grant funding

Final grant amount: $32,000 Final total project costs: $29,801.48

Matching funds: Final cash: $0 Final in-kind: $0 Final Loan: $0

MPCA project manager: Bryan Spindler

1.2 List of Impairments within Lower Minnesota River Watershed

Reach name	Reach Description	River AUID	Affected designated use	Pollutant or stressor	TMDLStart/End Date
Buffalo Creek	Unnamed cr to High Island Cr	07020012-578	Aquatic life	Fishes Bioassessments	2014/2018
Buffalo Creek	Unnamed cr to High Island Cr	07020012-578	Aquatic life	Turbidity	2014/2018
Chaska Creek	Headwaters to Minnesota R	07020012-512	Aquatic recreation	Fecal Coliform	2014/2018
County Ditch 10	CD 3 to Raven Str	07020012-628	Aquatic recreation	Fecal Coliform	2014/2018
High Island Creek	Bakers Lk to Unnamed cr	07020012-654	Aquatic life	Turbidity	2014/2018
High Island Creek	JD 15 to Bakers Lk	07020012-653	Aquatic life	Turbidity	2014/2018
High Island Creek	Unnamed Cr to Minnesota R	07020012-589	Aquatic life	Fishes Bioassessments	2014/2018
High Island Creek	Unnamed Cr to Minnesota R	07020012-589	Aquatic life	Turbidity	2014/2018
High Island Ditch 2	Unnamed cr to High Island Cr	07020012-588	Aquatic life	Turbidity	2014/2018
Judicial Ditch 1A	CD 40A to S Br Rush R	07020012-509	Limited Resource Value	Escherichia coli	2014/2018
Judicial Ditch 22	Unnamed cr to Silver Cr	07020012-629	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Bevens Cr to Sand Cr	07020012-501	Aquatic life	Turbidity	2014/2018
Minnesota River	Carver Cr to RM 22	07020012-506	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Carver Cr to RM 22	07020012-506	Aquatic life	Turbidity	2014/2018
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Cherry Cr to Le Sueur Cr	07020012-507	Aquatic life	Turbidity	2014/2018
Minnesota River	High Island Cr to Bevens Cr	07020012-502	Aquatic recreation	Fecal Coliform	2014/2018

Minnesota River	High Island Cr to Bevens Cr	07020012-502	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Le Sueur Cr to Rush R	07020012-504	Aquatic consumption	PCB in fish tissue	1998/2025
Reach name	Reach Description	River AUID	Affected designated use	Pollutant or stressor	TMDLStart/End Date
Minnesota River	RM 22 to Mississippi R	07020012-505	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	RM 22 to Mississippi R	07020012-505	Aquatic life	Turbidity	2014/2018
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic recreation	Fecal Coliform	2014/2018
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	Rush R to High Island Cr	07020012-503	Aquatic life	Turbidity	2008/2014
Minnesota River	Sand Cr to Carver Cr	07020012-532	Aquatic consumption	PCB in fish tissue	1998/2025
Ninemile Creek	Headwaters to Minnesota R	07020012-518	Aquatic life	Fishes Bioassessments	2024/2028
Porter Creek	Headwaters to Sand Cr	07020012-540	Aquatic life	Turbidity	2014/2018
Raven Stream	E Br Raven Str to Sand Cr	07020012-716	Aquatic Life	Chloride	2009/2015
Raven Stream, East Branch	Headwaters (Lk Pepin 400028-00) to Raven Str	07020012-543	Aquatic Life	Chloride	2009/2015
Raven Stream, West Branch	Headwaters (Rennenberg Lk 40-0088-00) to E Br Raven Str	07020012-715	Aquatic recreation	Fecal Coliform	2014/2018
Riley Creek	Riley Lk to Minnesota R	07020012-511	Aquatic life	Turbidity	2014/2018
Rush River	M Br Rush R to S Br Rush R	07020012-548	Aquatic life	Turbidity	2014/2018
Rush River	S Br Rush R to Minnesota R	07020012-521	Aquatic life	Turbidity	2014/2018
Rush River, Middle Branch (County Ditch 23 and 24)	CD 42 to Rush R	07020012-550	Limited Resource Value	Escherichia coli	2014/2018
Rush River, North Branch (County Ditch 55)	Unnamed ditch to T112 R27W S17, east line	07020012-558	Limited Resource Value	Escherichia coli	2014/2018
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Chloride	2009/2015
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Fishes Bioassessments	2014/2018
Sand Creek	Porter Cr to Minnesota R	07020012-513	Aquatic life	Turbidity	2014/2018
Sand Creek	Raven Str to Porter Cr	07020012-538	Aquatic life	Turbidity	2014/2018
Sand Creek	T112 R23W S23, south line to Raven Str	07020012-662	Aquatic Life	Chloride	2009/2015
Sand Creek	T112 R23W S23, south line to Raven Str	07020012-662	Aquatic life	Turbidity	2014/2018
Unnamed creek	Goose Lk (10-0089-00) to Unnamed wetland	07020012-618	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Headwaters to Carver Cr	07020012-526	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Headwaters to Minnesota R	07020012-528	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek	Unnamed cr to Unnamed cr	07020012-579	Aquatic life	Fishes Bioassessments	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic life	Fishes Bioassessments	2014/2018
Unnamed creek (East Creek)	Unnamed cr to Minnesota R	07020012-581	Aquatic life	Turbidity	2014/2018
Unnamed creek (Lake Waconia Inlet)	Unnamed wetland to Lk Waconia	07020012-619	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed ditch	Burandt Lk to Unnamed Cr	07020012-527	Aquatic recreation	Fecal Coliform	2014/2018
Unnamed ditch	Burandt Lk to Unnamed Cr	07020012-527	Aquatic Life	Oxygen, Dissolved	2014/2018

2. Executive Summary

2.1 Problem

The Lower Minnesota River Watershed (LMRW) is the second largest watershed in the Minnesota River Basin at a size of 1,760 square miles, and encompasses the lowest reach of the Minnesota River. Eventually the Minnesota River joins with the Mississippi River in Saint Paul near the Fort Snelling historic landmark. The major tributaries that fall within the LMRW include: Rush River, High Island Creek, Bevens Creek, Carver Creek, Sand Creek, Nine Mile Creek, and the Credit River. There are numerous impairments found within the watershed. Water impairments for the Lower Minnesota River were documented as early as 1998 and still continue today in 2018. Ecoli, fecal coliform, chloride, turbidity, fishes bioassesments, PCB in fish tissue, and dissolved oxygen were listed as pollutants or stressors found within the LMRW. As part of the Watershed Restoration and Protection Strategy (WRAPS), this report was assembled to highlight the civic engagement strategies within the watershed.

2.2 Project Highlights

Le Sueur County partnered with Le Sueur Soil and Water Conservation District (SWCD) and Rice County to collect information on civic engagement within the watershed. Meetings, interviews, conversations, and so forth were created and as a result summary reports on landowner's behaviors, beliefs, values, and participation within the watershed were produced. Outreach strategies and ideas were developed for the Lower Minnesota River Watershed as a group effort with Rice, Sibley, Nicollet, McLeod, and Le Sueur Counties.

2.3 Results

The LMRW Project is dependent on participation from landowners and citizens across the watershed as well as collaboration with local government staff in order to improve, protect, and restore the Lower Minnesota River Watershed. Conservation practices and water resource management are supported and accepted when individuals are able to discuss, reflect, and work together to solve problems. Le Sueur County and its partners that worked with the civic engagement projects during the WRAPS process will hopefully be able to provide effective guidance on future planning efforts for the LMRW.

2.4 Watershed Map

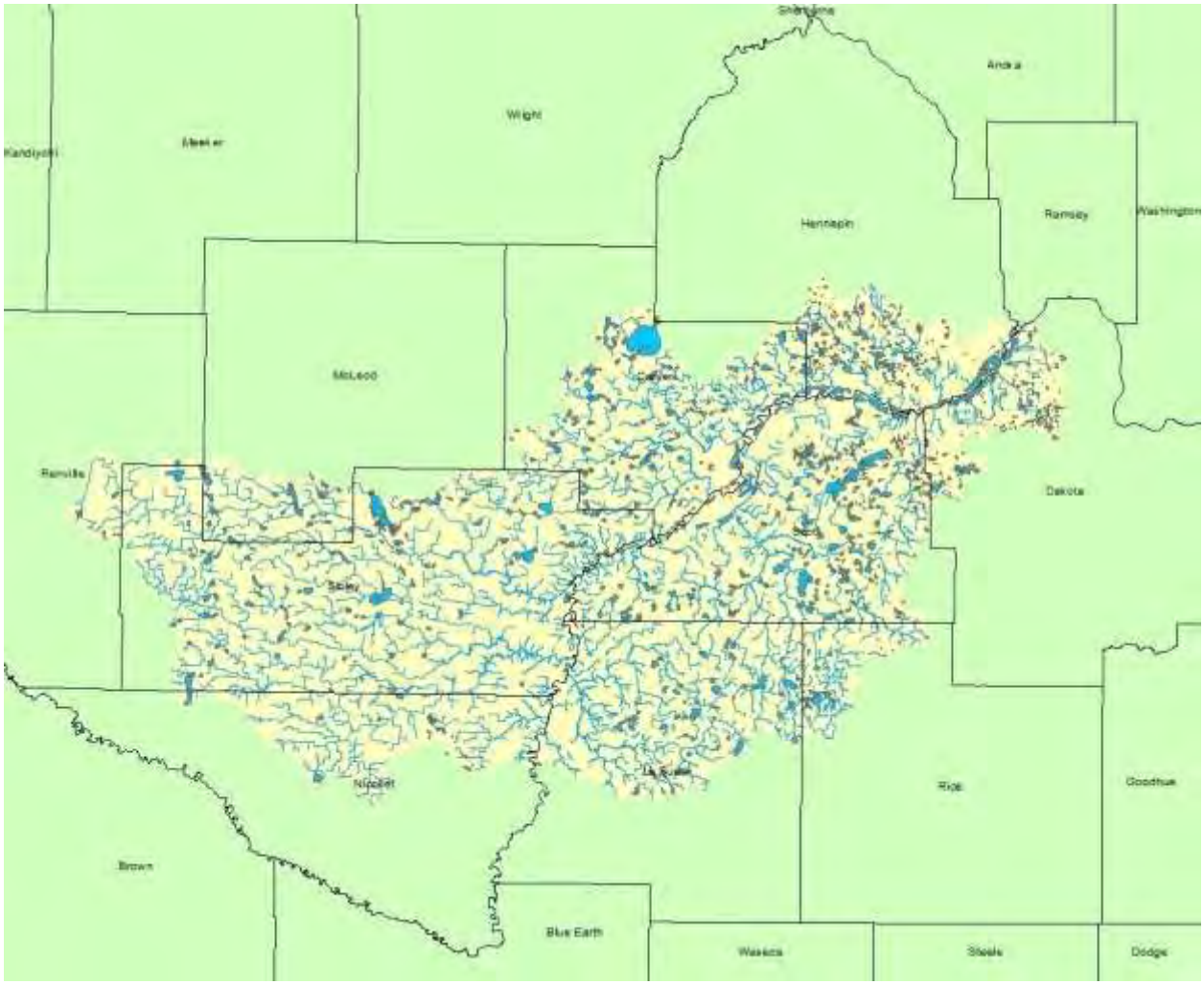


Figure 1. Lower Minnesota River Major Watershed.

3. Section 1-Work plan review

3.1 Summary of Changes

The Lower Minnesota River Watershed WRAPS South Project work plan and budget had undergone changes over the lifespan of the project. Staff turnover delayed required reporting. As a result, a two month extension was requested and approved for the submittal of the final report. In addition to changes in the work plan, the overall budget was adjusted as well. Additional funds were allocated to Le Sueur SWCD staff to complete the landowner interviews, and for the Le Sueur County Zoning Administrator to complete administrative tasks. In order to compensate for the additional funds being set aside for Le Sueur County and SWCD, a reduction in funds was completed for Rice and Le Sueur Counties mailings, printing, and postage. None of the tasks discussed in the work plan were affected due to budget alterations.

3.2 Summary of Activities-Objectives, Tasks, and Goals:

3.2.1 Objective 1: Community Engagement Team Planning.

Task A: Develop Community Engagement Activities. (Team Planning)

A few initial meetings were held with the civic engagement team in order to organize efforts and prepare timelines. During the lifespan of the project, additional meetings, phone calls, and emails were organized between Le Sueur SWCD and Rice County to discuss how to engage locals' values, beliefs, and perspectives in restoring and protecting the Lower Minnesota River Watershed. To aid with participation in the Next Chapter Winery event, mailing lists were combined with Le Sueur and Rice County. In order to have a successful interview process with landowners, Le Sueur SWCD spent time creating well thought interview questions and identified numerous candidates for interviews.

Task B: Attend Community Engagement Training

In the fall of 2016 and winter of 2017, focus group training workshops were held by the University of Minnesota Department of Forestry personnel. The main focus of these workshops was to teach LMRW partners how to collect data from focus groups. Knowledge was gained on how to utilize different survey methods as well as understand data collection. As a result, the LMRW partners were able to develop survey questions and mailing lists to be used for the WRAPS process.

Task C: Community Engagement Survey Input.

The U of M Department of Forestry staff needed assistance with developing landowner mailing lists for their survey. Staff from the LMRW (Sibley, Rice, McLeod, Nicollet, Renville, and Le Sueur) were able to help with the mailing list as well as provide input on the mail survey design and review of the survey questions.

3.2.2 Objective 2: Community Engagement Implementation.

Task A: Conduct Watershed Citizen Interview.

Le Sueur County SWCD met with 41 landowners in person to ask questions that were developed during the planning process. The six groups of questions that were discussed includes: farm and community, water resources, farm decision making, conservation practices, and background information. Many of the views that landowners shared were quite similar among the different groups of questions, but there also were differences. The results that were developed from these interviews provide important insights from the landowners and citizens within the LMRW. The knowledge, information, and understanding that was acquired will help LMRW partners develop and create more effective planning of conservation efforts within the watershed.

Task B: Outreach Events.

The outreach events were held at the Next Chapter Winery and Le Sueur County Fair. In order to encourage attendance at the Next Chapter Winery WRAPS meeting, postcards were sent out to Le Sueur and Rice County residents that live within the watershed. In order to encourage participation at the Le Sueur County Fair, a WS model was purchased for citizens to engage in. During both of these events, questionnaires related to the LMRW were given to citizens for input.

3.2.3 Objective 3: Community Engagement Documentation.

Task A: Summarization of Community Engagement Activities.

Summaries were developed from the interviews that were conducted by Le Sueur SWCD and also for the questionnaires that were filled out from landowners that participated at the Next Chapter Winery and Le Sueur County Fair events. Reports were produced for each activity.

3.2.4 Objective 4: Project Administration.

Task A: Progress Tracking.

Public participation was measured and documented. Expenses and activities were tracked by Le Sueur County and SWCD.

Task B: Project Management.

Subcontractors filed reimbursement requests with Le Sueur County. Progress was tracked throughout the lifespan of the project.

4. Section 2-Grant Results

4.1 Measurements

Summary reports were developed on landowner participation and/ or adoption of conservation practices within the Lower Minnesota River Watershed. During the outreach and education events, questions were also asked about the behaviors, norms, beliefs, values, and future participation with water resource management and conservation practices within the Lower Minnesota Watershed. The data and results that were produced will help LMRW partners understand the reasoning behind conservation practice adoption or lack of among landowners.

4.2 Products

4.2.1 Le Sueur County Fair

For three days, Le Sueur County had a booth at the Le Sueur County Fair (August 2017). Educational materials were displayed at the table. Additionally, a questionnaire was handed out for individuals. Over 300 kids participated with the watershed model and learned about conservation and basic watershed dynamics. Approximately 150 adults were engaged in conversation about watersheds, but the majority of them chose not to participate in the survey (only 24 had filled out a survey). Important insights and information were gained.

Watershed Questioner

1. Do you live or own property in Le Sueur Co.? If not, what County/State do you Live?
   a. Yes b. No
   c. Other _____
2. What Watershed do you live/own property in?
   a. Lower Minnesota River Watershed c. Cannon River Watershed

b. Middle Minnesota River Watershed d. Other _____

3. What do you believe are be the biggest factors impacting water quality where you live?
   a. Increased, sever rain/weather events d. Overdeveloped lots
   b. Agricultural practices/runoff e. Aquatic Invasive Species
   c. Failing septic systems f. Other _____

4. What, if any, conservation practices do you have in place on your property? Other Comments?
   _____
   _
   _____

5. Are there any lakes, streams, or wetlands that you know to have problems in your area?
   _____

6. What water quality topics would you like to see discussed at future workshops and events?
   _____

Watershed Questioner (summary)

1. Do you live or own property in Le Sueur Co.? If not, what County/State do you Live?
   a. Yes 14 (73.7%) b. No 5 (26.3%)
   c. Other _____
2. What Watershed do you live/own property in?
   a. Lower Minnesota River Watershed 19 c. Cannon River Watershed 7
   b. Middle Minnesota River Watershed 5 d. Other _3_____
3. What do you believe are be the biggest factors impacting water quality where you live?
   a. Increased, sever rain/weather events 4 (21%) e. Aquatic Invasive Species 3 (15.8%)
   b. Agricultural practices/runoff 9 (47.4%) f. Other 4 (21%) Urban development, Lawn fertilizers,
   c. Failing septic systems 3 (15.8%) Flooding, Golf courses d. Overdeveloped lots 1 (5.3%)
4. What, if any, conservation practices do you have in Minnesota River, Mill Pond (Jordan MN), Lake Jefferson place on your property? Other Comments? and Gorman Lake (Cannon River Watershed), and Slope stabilization, Restored wetlands, Conservation wetlands just in general. tillage, Organic dairy and farmland, drainage ponds, gutters to pervious surface, Water conservation,

   6. What water quality topics would you like to see

   Grassed waterways, Buffers, none

   discussed at future workshops and events?
5. Are there any lakes, streams, or wetlands that you Zebra Mussels and Aquatic Invasive species in general, know to have problems in your area? How to achieve clear water, Decreasing algae blooms,
   Improving Agricultural Practices (Buffers, Conservation tillage, Anhydrous and fertilizer application timing, Cover crops, Flood prevention, Fertilizer reduction), Water pollution in general, Urban lawn care, Drinking water quality and protection. General comment - try and incorporate this type of info in schools, especially rural schools to help educate youth.

I attended the Le Sueur County Fair, August 17-20 and set up a table with watershed information and an Enviroscape model. The model was very popular with the youth, over 300 kids played with the model while learning about conservation and basic watershed dynamics. While most adults did not want to

participate in the survey, I did speak to approximately 150 adults during the course of the fair. In general, people were interested to find out which watershed they lived in and where their water went. Most people had a very limited understanding of watersheds and found the information interesting.

General topics of concern:

- Flooding-need more water storage
- Recreational water usage-water quality
- Implementing/encouraging newer farming practices that have less impact (cover crops)
- Reducing urban impacts (lawn fertilizers, water storage)
- Increase education in schools

4.2.2 Next Chapter Winery Meeting

Another outreach event that occurred during the WRAPS process, was an informational meeting held at Next Chapter Winery. 3624 postcards were sent out to invite landowners located within Le Sueur and Rice Counties. 59 individuals had attended the meeting along with state and local staff. 10 individuals participated in the questionnaire. A presentation was created to explain the WRAPS process and why landowners were invited to the meeting. Important insights and information were gained.

Civic Engagement Questions Next Chapter Winery

1. How important are lakes and streams to you and your community?

2. Who do you think is responsible for protecting and improving water quality and why?

3. What, if any, Better Management Practices (BMPs) do you have implemented on your property? What other areas so you think would benefit from implementing different BMPs? What hurtles do you see in implementing these practices?

4. Would the following programs or conditions increase the likelihood that you would consider implementing a conservation practice?

    a. Payments
    b. Cost-share
    c. Technical assistance
    d. Success stories
    e. Other

5. If you are interested in attending future workshops, what topic(s) would interest you the most?

    a. Stormwater management at home
    b. Landscaping for clean water
    c. Clean drinking water
    d. Ag BMPs for cleaner water
    e. Other

Lower Minnesota River WRAPS Civic Engagement

Le Sueur and Rice Counties

11/30/2017

Next Chapter Winery

On Thursday, November 30th, an informational meeting was held at Next Chapter Winery in New Prague, MN from 3:00-5:00 pm. Please see agenda listed below. 3624 invitations were mailed to Le Sueur County (2325) and Rice County (1299) residence within the Lower Minnesota Watershed, of these 59 attended (46 from Le Sueur/13 from Rice). Also in attendance were various state and local staff.

At the conclusion of the presentations, those in attendance were asked the questions listed below. The number of each response is included. Only ten people replied to the questions.

6. How important are lakes and streams to you and your community? Very Important (7). Somewhat important (1). Important (1).

7. Who do you think is responsible for protecting and improving water quality and why?
   Landowners, LGUs (2), Homeowners, Agriculture. Everyone (8). Citizens.

8. What, if any, Better Management Practices (BMPs) do you have implemented on your property? What other areas so you think would benefit from implementing different BMPs? What hurtles do you see in implementing these practices? Do our best with CRP, buffers, household waste, farm chemicals, burning weeds. Grassed Waterways (2) (cost is always a hurtle). Open the drainage systems, protect wetlands, buffer strips, bank stabilization projects, cost. Prevent washouts, regulation on cities and residential runoff, money. CREP (Cost and loss of productive land). CRP, SAFE (Cost). Trench tillage. CREP, Filter strips.
9. Would the following programs or conditions increase the likelihood that you would consider implementing a conservation practice?
   a. Payments (5)
   b. Cost-share (5)
   c. Technical assistance (4)
   d. Success stories (0)
   e. Other (3. All the above)

10. If you are interested in attending future workshops, what topic(s) would interest you the most?
    a. Stormwater management at home (2)
    b. Landscaping for clean water (2)
    c. Clean drinking water (2)
    d. Ag BMPs for cleaner water (4)

e. Other (2. Tips, Guides, and classes9tree planting, planting for habitat, weed control)

General Comments:

- Address erosion issues between Rice and Le Sueur Counties (Kilkenny Township).
- Need to implement a program to start testing water coming from tile lines.

LOWER MINNESOTA RIVER WRAPS

Civic Engagement
Le Sueur & Rice Counties

What is a Watershed

- A watershed is the area of land where all of the water that drains off of it goes into the same place - a river, stream or lake.
- https://youtu.be/QOrVotzBNto

Lower Minnesota Watershed

What is a WRAPS?

- WRAPS =Watershed Restoration and Protection Strategy.
- The State of Minnesota has adopted a "watershed approach" to incorporates **water quality assessment, watershed analysis, civic engagement, planning, implementation**, and **measurement of results** that addresses restoration and protection.
- Support local groups and jointly develop restoration and protection strategies to be used for future planning.
- Summarize watershed work that has already been completed.

What's Next

- Once the WRAPS document is completed, local Counties and SWCDs will work together to create water plans (One Watershed, One Plan) to implement the information that was collected in the WRAPS.
- Moving from water plans based on county boarders to those based on hydrology.

Why are you here today

- Your input is pivotal to the WRAPS process.
  - Help determine the types of BMPs that are supported in the final plan.
  - Guide where futures efforts for protection and restoration will be implemented.
  - What type of issues should be addressed in future plans (erosion, shoreland issues, hydrology, etc.).
  - Future developmental concerns.

Introductions

- Jon Lore (MN DNR)
- Mike Schultz (Le Sueur County SWCD)
- Joe Jirik (Le Sueur County SWCD)
- Jack Bushman (Le Sueur County SWCD)
- Steve Breaker (NRCS)
- Gary Kunz (FSA)
- Herman Bartsch (MDA)

4.2.3 Soil and Water Conservation District Watershed Citizen Interviews

Le Sueur County SWCD met with 41 landowners one on one to discuss questions that related to farm and community, water resources, farm decision making, conservation practices, and background information. The majority of participants, 88%, identified water resources as being important to their family, community, and themselves. Conservation practices have been adopted by 100% of the participants. The most common BMP adopted was terraces. The main driving force behind practice adoption was erosion issues. Most participants stated that the primary reason for lack of practice adoption was financially related. Overwhelmingly, it was mentioned that landowners had positive working relationships with agencies such as SWCDs, NRCS, and FSA. The information that was gathered will be used for future planning efforts in the watershed.

Lower Minnesota WRAPS Civic Engagement Le Sueur County

Landowner Interview

Interviewee: _____ Interviewer: _____

Date: _____

Your farm and your community

1. Define your community?
2. What does farming mean to you? How would you describe your farm to a friend?
3. What concerns do you have about your farm or farming in general? If you could change something about farming what would you change?
4. What do you like most about living here? What would you say are the biggest assets of your community?
5. Do you have any concerns about your community? Explain?
6. Has your community changed in the last 10 years? How so?

Broader community capacity

1. I'd like you to think of a time when your community or a group of community members came together to rally around some issues, opportunity, or problem? Please describe the situation to me. Who was involved? What was accomplished?
2. Are there certain individuals, groups, or organizations that are generally trusted by community members? What makes them trusted?

Water Resources

1. How important are local water resources such as streams and lakes to you and your family? Explain.
2. How important are local water resources such as streams and lake to quality of life in your community? Explain.
3. How would you describe water resources in this area? Do you have any concerns about water quality or access to clean water in the area? Explain.
4. Whose responsibility is it to keep water resources in this area healthy?

Farm decision making

1. How do you evaluate the success of your operation?
2. Have you changed the way that you farm in the past 5 years in attempt to make your farm more successful?
3. What are the most important decisions you have to make on your farm?
4. What are the most important considerations for you when making decisions about conservation practices on your farm? To what extent does the Farm Bill impact how you operate your farm?
5. Who are you trusted sources of information about farm management decisions? What makes them trusted?
6. Who are your trusted sources of information about conservation decisions? What makes them trusted?

Conservation Practices

1. When you think of agricultural conservation practices, what comes to mind?
2. Do you use any conservation practices on your land?
    a. Please describe them for me?
    b. What problems are you trying to address with them?
    c. What first motivated you to use this practice?
    d. How well are the practices working for you?
3. Are there other practices you've considered implementing? What has kept you from doing more implementation?
4. What do you see as the primary barriers or constraints to adopting these other practices? (List practices and corresponding barriers)
5. Would you be willing to try out any of these practices if those barriers could be addressed?
6. Would any of the following programs or conditions increase the likelihood that you would try out a new conservation practice?
    a. Payments
    b. Cost –share
    c. Technical assistance
    d. Stories from farmer who have had success with the practice
7. What has been your experience with the SWCD and/or NRCS?
8. What has been your experience with other governmental units?
9. When you want information or resources related to conservation practices, where do you go for help?

Background information

1. Do you own or rent most of your land?
2. Describe your farm operation. Acres owned/rented, tillage decisions, fertilizer/pesticide decisions, crop rotations, rollers, etc.
3. Do you treat rented and owned land differently?
4. How long do you plan to farm and who will farm after you retire?
5. Can we contact you in the future with more questions or information about upcoming events or anyone else you know?

Summarized Landowner Interviews
8/27/2018

Description:

The Lower Minnesota River Watershed (LMRW) covers approximately 1,174,348 acres across southeast central Minnesota, spanning the terminal segment of the Minnesota River before it joins the Mississippi River, stretching 87 miles from rural Ottawa northeast to the doorstep of urban St. Paul. Counties included in the watershed include Carver, Dakota, Hennepin, Le Sueur, McLeod, Nicollet, Ramsey, Renville, Rice, Scott, and Sibley counties. The LMRW in Le Sueur County (LSC) accounts for approximately 152,590 acres or 7.7% of the watershed. LSC has several watercourses in the watershed Le Sueur Creek, Forest Prairie Creek, Sand Creek, and many county ditches. The watershed is located in the north half of Le Sueur County and is part of Le Sueur, Le Center, Montgomery and New Prague and several lakes.

The Le Sueur County SWCD met with 41 landowners one on one to discuss six groups of questions ranging from farm and community, water resources, farm decision making, conservation practices and background information.

The information gathered will be used for future planning efforts in the watershed.

Findings:

Your Farm and Your Community

1. **Define your community?**

   Summarized Response: Landowners, for the most part, related "community" to the city in which they are located nearest. Others defined their community as the group of neighbors that surround them. Either way the majority defined their community as small, agricultural and rural.

2. **What does farming mean to you? How would you describe your farm to a friend?**

   Summarized Response: 59% of landowners responded that farming is their livelihood and also replied their lifestyle. Many discussed the history and tradition of their farm.

3. **What concerns do you have about your farm or farming in general? If you could change something about farming what would you change?**
   Summarized Response: There was not just one answer that stood out with this question and many farmers had more than a few concerns. Crop prices, government control, profit margins, small farmers declining to big businesses and land stewardship were concerns of the majority.

4. **What do you like most about living here? What would you say are the biggest assets of your community?** About one quarter of those interviewed still remain on the family farm and hope to keep the legacy alive. Others enjoy the peace and quiet of the country lifestyle.

5. **Do you have any concerns about your community?**

   Summarized Response: Surprisingly 42% of landowners answered that they don't have any concerns about their community. The next most popular answer was the loss of businesses in their towns.

6. **Has your community changed in the last 10 years?**

   Summarized Response: Loss of businesses was brought up but what was also interesting was the landowners concerns about having a local high school. Within the last 5 years, 3 communities combined school districts and now the high school is located in one of the towns, leaving the farmers to feel their community has nothing to offer new people to move there. Population was brought up by some but also mentioned was the feeling of strangers in the community and how the crime rate has grown.

Broader Community Capacity

1. **I'd like you to think of a time when your community or a group on community members came together to rally around some issues, opportunity, or problem? Please describe the situation to me. Who was involved? What was accomplishes?**

   Summarized Response: The two issues that most discussed were the combining of the schools and rallying to keep a town's local police department. A couple farmers brought up benefits held to help an injured landowner or trying to keep open the small church that their entire community worships in.

2. **Are there certain individuals, groups, or organizations that are generally trusted by community members? What makes them trusted?**

   Summarized Response: One third of landowners answered that their local police force or the county sheriff's office was their most trusted groups in their communities. It may be noteworthy to learn the second most popular answer was "not applicable" which 25% of those surveyed answered.

Water Resources

1. **How important are local water resources such as streams and lakes to you and you're your family?**

Summarized Response: 88% of those surveyed answered very important! The others offered similar answers and only 1 landowner answered "not very".

2. **How important are local water resources such as streams and lakes to quality of life in your community?**

   Summarized Response: 80% of landowners answered very and others had similar responses. There were a few remarks made that water resources were important to others and not themselves and not so important but the majority feel the importance.

3. **How would you describe water resources in this area? Do you have any concerns about water quality or access to clean water in the area?**

   Summarized Response: Over half the farmers had no concerns about their quality of water while others felt measures need to be taken to secure the quality of water for the future. These landowners talked about chemicals used in fields and on lawns and septic systems.

4. **Whose responsibility is it to keep water resources in this area healthy?**

   Summarized Response: All questioned either replied everyone or their community.

Farm Decision Making

1. **How do you evaluate the success of your operation?**

   Summarized Response: 71% interviewed feel their operations are successful. They all defined success in different ways. Some used the word financial success, some quality of life and their family working together meant success. One landowner said he feels successful if he makes it another year farming.

2. **Have you changed the way that you farm in the past 5 years in attempt to make your farm more successful?**

   Summarized Response: The majority of landowners, 83%, have somehow changed the way they farm in the last 5 years. 44% have established conservation methods, some have reduced fertilizer or updated machinery for less tillage.

3. **What are the most important decisions you have to make on your farm?**

   Summarized Response: Over half of those questioned said financial was the most important. Six mentioned selling grain and livestock as their most important which could be lumped in with financial. A few farmers said, "Everything"!

4. **What are the most important considerations for you when making decisions about conservation practices on your farm? To what extent does the Farm Bill impact how you operate your farm?**

   Summarized Response: 69% of farmers said the farm bill impacts the way they farm. With financial being the majority's most important farming decision, they feel they need to comply with USDA programs and policies to ensure government payments.

   Conservation decisions are based on costs and need. The farmer is much more likely to make a change towards conservation if he can see a financial benefit first.

5. **Who are your trusted sources of information about farm management decisions? What makes them trusted?**

   Summarized Response: Almost all surveyed said either their local Coop, their farm management instructor or themselves as their trusted source on farm management. Many read farm magazines and listen to the farm channels for further information.

6. **Who are your trusted sources of information about conservation decisions? What makes them trusted?**

   Summarized Response: 81% of landowners said that the Le Sueur County SWCD, NRCS and FSA offices are their most knowledgeable source for conservation. Others mentioned themselves, magazines and the University of Minnesota.

Conservation Practices

1. **When you think of ag conservation practices, what comes to mind?**

   Summarized Response: Many farmers gave a long list of different types of practices. Terraces, CRP, buffers, waterways and no-till were the most common. Cover crop interest has grown. Windbreaks, residue management, alfalfa in rotation and organic farming were some others.

2. **Do you use any conservation practices on your land?**

   Summarized Response: 100% of those surveyed replied that they use conservation practices on their land.

   A: **Please describe them to me?**

   Summarized Response: Terraces are the most common practice used by landowners in Le Sueur County due to the rolling hills in the watershed.

   B: **What problems are you trying to address with them?**

Summarized Response: 81% replied they are addressing water erosion with their conservation practices and others said wind erosion and soil health.

C: **What first motivated you to use this practice?**

Summarized Response: Erosion was what first motivated the farmers to begin installing terraces. Some had poor crops and wanted to become better stewards of the land.

D: **How well are the practices working for you?**

Summarized Response: 96% answered that their practices are working good.

3. **Are there other practices you've considered implementing? What has kept you from doing more implementation?**

Summarized Response: Many of the landowners are curious about cover crops and would like to try them.

4. **What do you see as the primary barriers or constraints to adopting these other practices? (List practices and corresponding barriers)**

Summarized Response: Cost seemed to be the initial answer for seeding cover crops although landowners are hesitant because they would like more information on the benefits.

5. **Would you be willing to try out any of these practices if those barriers could be addressed?**

Summarized Response: Some of the landowners surveyed didn't respond to this question because they need more information on deciding what would benefit their land.

6. **Would any of the following programs or conditions increase the likelihood that you would try out a new conservation practice?**

A. **Payments:**

Summarized Response: 61% responded yes that payments would persuade them to try something new.

B. **Cost-Share:**

Summarized Response: 49% responded that a percentage of cost-share would help them with deciding on a new practice.

C. **Technical Assistance:**

Summarized Response: One quarter of those surveyed said they would be willing to install a new practice with just technical assistance from the SWCD.

D. **Stories from farmer who had success with the practice:**

Summarized Response: Interestingly more landowners responded they would try a new conservation practice if a farmer friend told them of their success than they would with technical assistance.

7. **What has been your experience with the SWCD and/or NRCS?**

Summarized Response: 96% have had a very good relationship with the SWCD/NRCS office and the others describe their experiences as fine.

8. **What has been your experience with other government units?**

Summarized Response: Half of those interviewed commented that their experiences were ok and the other half interviewed preferred not to answer this question.

9. **When you want information or resources related to conservation practices, where do you go for help?**

Summarized Response: 93% of farmers said they come to the Le Sueur County SWCD office for conservation related questions. Some said they will visit with their Agronomist or look in farm magazines.

Background Information

1. **Do you own or rent most of your land:**

Summarized Response: Over half of the landowners own their land, some own and rent 50/50 and a few just rent their land.

2. **Describe your farm operation. Acres owned/rented, tillage decisions, fertilizer/pesticide decisions, crop rotations, rollers, etc.**

Summarized Response: Over 76% of farmers have a corn/soybean rotation and cash crop. Very few have livestock, dairy is diminishing rapidly. Quite a few plant small grain and hay.

3. **Do you treat rented and owned land differently?**

Summarized Response: 78% of the farmers said they do not treat rented and owned land differently. The others that do treat the land differently is due to the fact that they are in rental contracts so chemical applications are the main reasons.

4. **How long do you plan to farm and who will farm after you retire?**

Summarized Response: 66% of farmers expect to have family taking over the farm, either a son/daughter or nephew. Farming is a lifestyle and many have no plans to ever leave or quit farming until they are physically incapable or pass away.

5. **Can we contact you in the future with more questions or information about upcoming events or anyone else you know?**

Summarized Response: All answered yes that they would be more than willing to visit with us.

4.3 Public outreach and education

4.3.1 Questionnaires

Questionnaires were created for the Next Chapter Winery Meeting and Le Sueur County Fair in order to have a better understanding of landowner involvement with water resources and conservation practices as well as their personal beliefs, values, and behaviors. Data that was collected will be included as part of the WRAPS process, and hopefully will help with future water resource management.

4.3.2 Next Chapter Winery Meeting

On November 30th, 2017 a WRAPS informational meeting was held at the Next Chapter Winery in New Prague, MN. Postcards were mailed to 3624 household located within Rice and Le Sueur Counties. During this event, 59 landowners attended. Additionally, NRCS, FSA, SWCD, MDA, MN DNR, and County staff attended the meeting. Topics that were discussed included: information about state and federal programs (CRP, CREP, EQIP, MAWQCP), cost share opportunities, basic information about the Lower MN Watershed and the WRAPS process, and why the participants were invited to the event.

4.3.3. Le Sueur County Fair 2017

From August 17-20th in 2017, Le Sueur County had educational materials (watershed model, AIS, etc.) and a questionnaire available for individuals to participate in. Information was gathered on landowner knowledge of water resources and participation with conservation practices within the LMRW. **4.4 Long-term results**

4.4.1 Capacity Building

The results from the projects that were completed will help provide knowledge and understanding of how to get landowners, citizens, and others involved with practices that improve water quality within the Lower MN Watershed. Efforts were focused in both agriculture and urban settings. The public was able to provide a deeper insight on their views of water and the importance of how it impacts them. They were also able to reflect and report their struggles and reasoning behind practice adoption or lack of. The main messages that were taken from this project are listed as the following:

- Majority of landowners understand that water resources are important
- Need for more education and outreach for landowners on a variety of topics related to watersheds and conservation practices
- Lack of conservation practice adoption is due to:
    - Financial reasons
    - Need for Technical Assistance
    - Community leadership
- Cost-share and/or technical assistance is preferred when adopting BMPs
- Strong interest is expressed with landowners to implement some type of BMP (ex: cover crops)
- Many landowners have already implemented BMP's

4.4.2 Partnerships and Alliances

Le Sueur County and Soil and Water Conservation District enjoyed working with LMRW partners (Rice, Sibley, Nicollet, Renville, and McLeod counties), Minnesota Pollution Control Agency, and the University of Minnesota. Interactions at workshops, trainings, community activities, and so forth developed stronger professional relationships and provided noteworthy knowledge and information during the WRAPS process. As a result from this project, partners will be able to be more effective in communicating with other government entities and implementing conservation practices within the Lower MN Watershed. The activities and results that were included as part of this project will be used in the WRAPS document and will be an important resource for the One Watershed One Plan process.

4.4.3 Lessons Learned

One of the greatest lessons discovered with this project is just how much diversity occurs throughout the watershed. Differences occur by county and even within each county. These dissimilarities include things such as: farming practices that are used, types of BMPs favored/adopted, and views towards conservation and watershed management. Addressing these unique differences will be extremely important when trying to complete conservation activities, ideas, and goals that currently and/or will occur throughout the watershed. There also are similarities shared among the watershed when trying to understand the reasoning behind practice adoption or lack of.

4.4.4 Project Feedback

The civic engagement project work that was completed is important for the WRAPS process. Due to staff turnover, Le Sueur County had some delays when completing projects tasks. Using additional outreach and education tools and resources may have created better participation during the Le Sueur County Fair.

5. Section 3-Final Expenditures

Objective	Line Item	Budget	Invoice 3	Spent	Balance
Objective 1: Community Engagement Team Planning					
Objective 1A: Develop Community Engagement Activities	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 1A: Develop Community Engagement Activities	Personnel: LSC Water Resources Specialist	$ 396.90	$ -	$ 396.90	$ -
Objective 1A: Develop Community Engagement Activities	Subcontracting: LSC SWCD Program Specialist	$ 550.70	$ -	$ 550.70	$ -
Objective 1A: Develop Community Engagement Activities	Subcontracting: LSC SWCD Senior Tech	$ 447.70	$ -	$ 447.70	$ -
Objective 1A: Develop Community Engagement Activities	Subcontracting: LSC SWCD District Tech	$ 321.90	$321.90	$ 321.90	$ -
Objective 1B: Community Engagement Training	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 1B: Community Engagement Training	Personnel: LSC Water Resources Specialist	$ 317.52	$ -	$ 317.52	$ -
Objective 1B: Community Engagement Training	Subcontracting: LSC SWCD Program Specialist	$ 440.56	$ -	$ 440.56	$ -
Objective 1B: Community Engagement Training	Subcontracting: LSC SWCD Senior Tech	$ 358.16	$ -	$ 358.16	$ -
Objective 1B: Community Engagement Training	Subcontracting: LSC SWCD District Tech	$ 257.52	$ -	$ -	$ 257.52
Objective 1C: Community Engagement Survey Input	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 1C: Community Engagement Survey Input	Personnel: LSC Water Resources Specialist	$ 396.90	$ -	$ 19.85	$ 377.05
Objective 1C: Community Engagement Survey Input	Subcontracting: LSC SWCD Program Specialist	$ -	$ -	$ -	$ -
Objective 1C: Community Engagement Survey Input	Subcontracting: LSC SWCD Senior Tech	$ 447.70	$ -	$ 447.70	$ -
Objective 1C: Community Engagement Survey Input	Subcontracting: LSC SWCD District Tech	$ 321.90	$ 321.90	$ 321.90	$ -
Objective 2: Community Engagement Implementation					
Objective 2A: Conduct Watershed Citizen Interviews	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 2A: Conduct Watershed Citizen Interviews	Personnel: LSC Water Resources Specialist	$ -	$ -	$ -	$ -
Objective 2A: Conduct Watershed Citizen Interviews	Subcontracting: LSC SWCD Program Specialist	$11,895.12	$8,040.22	$11,895.12	$ -
Objective 2A: Conduct Watershed Citizen Interviews	Subcontracting: LSC SWCD Senior Tech	$2,059.42	$2,059.42	$2,059.42	$ -
Objective 2A: Conduct Watershed Citizen Interviews	Subcontracting: LSC SWCD District Tech	$ -	$ -	$ -	$ -
Objective 2B: Outreach Events	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 2B: Outreach Events	Personnel: LSC Water Resources Specialist	$ 1,309.77		$ 1,309.77	$ -
Objective 2B: Outreach Events	Subcontracting: LSC SWCD Program Specialist	$ 550.70	$ 330.42	$ 550.70	$ -
Objective 2B: Outreach Events	Subcontracting: LSC SWCD Senior Tech	$ 447.70		$ 447.70	$ -
Objective 2B: Outreach Events	Subcontracting: LSC SWCD District Tech	$ 321.90	$ 321.90	$ 321.90	$ -
Objective 2B: Rice Co Postage	750 mailings at up to $0.50 per mailing	$ 368.26		$ 368.26	$ -
Objective 2B: Le Sueur Co Postage	1320 mailings at up to $0.50 per mailing	$ 660.39		$ 660.39	$ -
Objective 2B: Rice Co Printing	750 printings at up to $0.61	$ 159.23		$ 159.23	$ -

Objective 2B: Le Sueur Co Printing	1320 printings at up to $0.61	$ 265.71		$ 265.71	$ -
Objective 2B: Supplies	Meeting Refreshments/Supplies, WS Model	$ 930.31		$ 930.31	$ -
Objective 2: Mileage	Commissioner's Rate	$ 1,026.77	$ 367.33	$ 566.04	$ 460.73

Objective 3: Community Engagement Documentation					
Objective 3A: Summarization of Activities	Personnel: LSC P&Z Admin	$ -	$ -	$ -	$ -
Objective 3A: Summarization of Activities	Personnel: LSC Water Resources Specialist	$ 1,786.05	$ -	$ 992.25	$ 793.80
Objective 3A: Summarization of Activities	Subcontracting: LSC SWCD Program Specialist	$ 1,101.40	$ 1,101.40	$ 1,101.40	$ -
Objective 3A: Summarization of Activities	Subcontracting: LSC SWCD Senior Tech	$ 895.40	$ 895.40	$ 895.40	$ -
Objective 3A: Summarization of Activities	Subcontracting: LSC SWCD District Tech	$ -	$ -	$ -	$ -
Objective 4: Administration					
Objective 4A: Progress Tracking	Personnel: LSC P&Z Admin	$ 360.99	$ 154.71	$ 154.71	$ 206.28
Objective 4A: Progress Tracking	Personnel: LSC Water Resources Specialist	$ 595.35	$ 396.60	$ 595.35	$ -
Objective 4A: Progress Tracking	Subcontracting: LSC SWCD Program Specialist	$ -	$ -	$ -	$ -
Objective 4A: Progress Tracking	Subcontracting: LSC SWCD Senior Tech	$ -	$ -	$ -	$ -
Objective 4A: Progress Tracking	Subcontracting: LSC SWCD District Tech	$ -	$ -	$ -	$ -
Objective 4B: Project Management	Personnel: LSC P&Z Admin	$ 825.12	$ 721.98	$ 721.98	$ 103.14
Objective 4B: Project Management	Personnel: LSC Water Resources Specialist	$ 2,182.95	$ 1,607.45	$ 575.50	$ 2,182.95
Objective 4B: Project Management	Subcontracting: LSC SWCD Program Specialist	$ -	$ -	$ -	$ -
Objective 4B: Project Management	Subcontracting: LSC SWCD Senior Tech	$ -	$ -	$ -	$ -
Objective 4B: Project Management	Subcontracting: LSC SWCD District Tech	$ -	$ -	$ -	$ -
	Total:	**$ 32,000.00**	**$15,608.98**	**$29,801.48**	**$2,198.52**