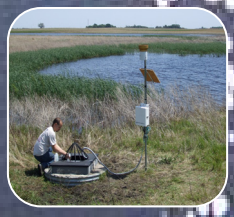
Little Cottonwood River Watershed Project

Final Report- Phase II- Clean Water Partnership

CREP

Minnesota River



BNC Water Quality Board

Kevin Kuehner

2008

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Executive Summary 2008

The Little Cottonwood River Watershed is a long narrow area spanning three counties and covering 170 sq. miles in South Central Minnesota. The watershed is part of the Middle Minnesota Major Watershed within the Minnesota River Basin. Nearly 90% of the watershed is comprised of row-crop cultivation.

A Phase I diagnostic study (1997-2000) indicated reductions in non-point sources of sediment, nutrients and pathogens throughout the watershed would contribute to improvements to the main stem of the Little Cottonwood and Minnesota River. In addition to water quality impairments, increased flooding frequency was found to be the biggest water resource issue for watershed residents. The technical committee identified several actions which would help lower non-point sources of pollution in the watershed while concurrently reduce the impacts associated with flooding.

In 2001, the Brown Nicollet Cottonwood Water Quality Joint Powers Board was successfully awarded a Phase II Clean Water Partnership Implementation Grant to help address water quality impairments within the watershed. The purpose of the Little Cottonwood River Clean Water Partnership was to protect and enhance water quality by helping accelerate the voluntary adoption of conservation practices within targeted areas of the watershed. Three primary goals were established for the six year project (2001-2007):

1. Establish 1,500 acres of permanent conservation easements within the 100 Year floodplain to address flooding and water quality issues.
2. Increase the enrollment of conservation buffers and small wetlands along the main-stem of the Little Cottonwood River and tributaries.
3. Achieve a sediment load reduction of 25%, phosphorus reduction of 30%, and a reversal of increasing nitrate levels, and pathogens such as E. coli bacteria.

Project staff utilized a variety of financial, technical and educational initiatives to help accomplish these aggressive goals, with major emphasis placed on providing additional staff to promote and deliver already existing conservation programs. Two positions were created to help facilitate the adoption of conservation practices, a Technical Service Representative and a Conservation Liaison. This approach proved to be a successful management technique. These positions were instrumental in leveraging the skills of conservation partners, new and existing conservation programs and ultimately increasing conservation adoption rates.

By the end of the project in 2007, a total of 2,835 acres of permanent conservation easements were enrolled in the Conservation Reserve Enhancement Program (CREP). A total of 1,275 acres (45%) of the easements were located within the 100-year floodplain. The remaining acres were associated with riparian buffers and restored wetlands. In addition, project staff helped promote and deliver Continuous

Conservation Reserve Program (CRP) filter strip and wetland restoration practices. An additional 700 acres were installed in the watershed as a result of this effort.

Installing riparian buffers along environmentally sensitive cropland was a very high priority during the project implementation phase. It is estimated that prior to the adoption of project related CREP and CRP, about 43 miles (27%) of the LCR main stem and its tributaries were buffered. Through the combined efforts of the watershed project and its partners, the amount of buffers in the watershed increased substantially. Remarkably, 103 miles or 65% of the riparian corridors within the watershed are adequately buffered from cropland practices. This represents an additional 60 miles (140% increase) of buffers within the watershed in less than six years. By 2007, the project and its partners ultimately helped accelerate the adoption of an additional 3,535 acres of new conservation practices within the watershed (74% increase).

In effort to help reduce trends associated with E. coli concentrations, 37 septic systems were upgraded utilizing special loans provided by the watershed project. This increased the level of compliant septic systems from 24% to 32%. Several other activities were completed including the installation of a milk house wastewater treatment system, installation of grassed waterways and the replacement of 41 open intakes. Numerous educational outreach materials and initiatives were also conducted to help educate watershed residents and partners.

An analysis of the sediment and nutrient loads (1998-2007) was conducted to determine if any reductions could be associated with the increased adoption of conservation by watershed landowners. The pollutant loads were separated into a '*before*' period (1998-2004) and an '*after*' period (2005-2007) The period after 2004 was selected since it was felt that all CREP and CCRP acres that were associated with the watershed project were installed after that point.

In general, it appears that there are some positive indications that sediment loads are decreasing (-11%), but phosphorus (+23%) and nitrate nutrient loads (+63%) are increasing. Increasing nitrate trends appear to be particularly strong. It should be emphasized that these conclusions are limited with respect to post treatment load data. Therefore, continued long term monitoring, analysis, and watershed computer model simulations will be imperative to validate any of these perceived observations.

It may be too early to accurately assess whether there are any watershed scale, water quality improvements resulting from the project, though it did clearly demonstrate the importance of people. The project demonstrated that it takes people devoted to the promotion, outreach, and nurturing of personal relationships with landowners and project partners to achieve significant conservation adoption achievements.

Project Background

This document serves as the final report for a Phase II Clean Water Partnership (CWP) which was granted to the Brown-Nicollet-Cottonwood Water Quality Joint Powers Board in March of 2001.

The purpose of the Little Cottonwood River CWP was to protect and enhance water quality by helping accelerate the voluntary adoption of conservation practices within targeted areas of the watershed.

Project staff utilized a variety of financial, technical and educational initiatives to help accomplish this goal, with major emphasis placed on providing additional staff to promote and deliver already existing state and federal conservation programs. This report highlights initiatives that were accomplished from 2001 through 2008.

Project Overview

The Little Cottonwood River Watershed is a long narrow area spanning three counties and covering 108,757 acres or 170 sq. miles (figure 1-1). The watershed lies within the Middle Minnesota Major Watershed of the Minnesota River Basin. As of 1992 the land use within the watershed consisted of 89% cultivated agricultural land.

Between 1989 and 1994, the upper reaches of the watershed were monitored as part of a groundwater study in Brown Nicollet and Cottonwood Counties. Results indicated groundwater and surface water were connected and poor quality surface water maybe contributing to the groundwater in this area.

In the spring of 1996, monitoring was intensified as part of a resource investigation project titled Middle/Lower Minnesota Assessment Project (MLAP). The main purpose was to identify which surface waters were negatively affecting the Minnesota River.

Although water quality was a concern, increased flooding was found to be the biggest water resource issue for the watershed residents.

In 1997 a Clean Water Partnership (CWP) was initiated to further study the watershed and soon after four water quality monitoring stations were established in the watershed. Due to setbacks from a widespread tornado, which struck parts of the watershed in the spring of 1998, the project was put on hold for one year. About 82% of the damage from the 1998 F3/F4 tornado was isolated to the Little Cottonwood River Watershed.

Results from the three-year study (1997-2000) indicated reductions in sediment, nutrients and pathogens throughout the watershed would contribute to improvements in the main stem of the Little Cottonwood and Minnesota River. Although water quality was a concern, increased flooding was found to be the biggest resource issue for watershed residents. The technical committee identified several actions, which would help lower the non-point sources of pollution in the watershed and remediate flooding concerns.

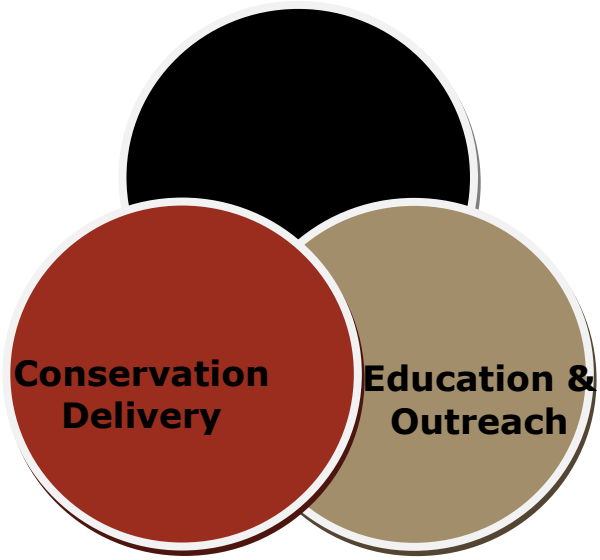
Implementation Period Begins

In 2000, the BNC Water Quality Board assembled a grant application to provide the funding to address some of the water quality issues documented in the diagnostic study. The proposal received partial funding through the state's Clean Water Partnership Program. The funding was awarded in two parts and also granted a 0.5 year extension to complete the project:

1. Years 2001 through 2004
    a. $297,600 grant and $150,000 in low-interest loans
    b. 100% of grant and loan application request funded
2. Years 2005 through 2007
    a. $157,696 grant and $150,000 in low-interest loans
    b. 51% of grant application request funded, 100% of loan funded
    c. Year 2008-Grant and Loan timeline was extended until June 30th 2008

Key Project Focus Areas

There were three basic components that provided the framework for the LCR Implementation project. Those components included: Education, Monitoring and Conservation Delivery. All three were very important and without the other, the potential for project success would be limited.



One key component of the conservation delivery portion of the project was to facilitate the enrollment of marginal agricultural land into federal and state set-aside programs. The Little Cottonwood River has numerous areas where active floodplain has been farmed and is contributing significant amounts of nutrients and sediments to the river. There was strong agreement by watershed managers that securing these areas into permanent and semi-permanent grass cover through existing conservation programs would greatly reduce the negative impacts of flooding, and sediment/nutrient loadings. It was estimated that over 4,500 acres of marginal agricultural land was eligible for the Conservation Reserve Enhancement program within the 100-year floodplain of the river. The outstanding results of increasing adoption of those practices are highlighted in Chapter 3.

In recent years the watershed has become a showcase water quality project for the Middle Minnesota River Basin due to the outstanding adoption of voluntary conservation programs. Furthermore, this project combined with the Seven Mile Creek Watershed Project has provided a greater understanding of surface water pollutant sources and solutions in the greater Minnesota River Basin.

Project Timeline

- In 1996 water quality monitoring began in the watershed and was funded though a Resource Investigation grant by the MPCA for the Middle Minnesota Major Watershed. Brown Nicollet Environmental Health provided the impetus to the project.
- In 1997 a Phase I diagnostic study was undertaken through 2000. The study was delayed one year due to tornado damage throughout the watershed and project offices in March of 1998.
- In 2001, a Phase II CWP was awarded to the project and implementation of best management practices began.
- Special programs included land retirement of cropland within the 100-year floodplain through the Conservation Reserve Enhancement Program (CREP), low-interest loans for outdated septic systems, vegetated filter strips along drainage ditches, wetland restorations, nutrient management, on-farm nitrogen rate demonstrations, open-tile intake replacements, and feedlot upgrades.
- In 2004, the project was granted an extension into 2005.
- In late 2004, the project was awarded continuation funding through June 2007.
- In late 2007, the project received an extension until June 30, 2008 to complete the final report.

Additional information relating to the watershed project or other similar projects can be found at http://mrbdc.mnsu.edu/org/bnc/ or contact the Brown Nicollet Water Quality Board/Environmental Health Office at 507-934-4140.

Partners

The Brown, Nicollet, Cottonwood Water Quality Joint Powers Board was the main coordinating organization. Assistance and in-kind was provided by a diverse partnership which included:

Funding Sources

- Clean Water Partnership Program, Minnesota Pollution Control Agency
- The McKnight Foundation
- Farm Bill Assistance Grant Program
- Brown County Pheasants Forever
- Watershed landowners, farmers and residents

Partners

This project was a collaborative effort between many different groups including farmers, landowners, and citizen groups, as well as the following:

- Blue Earth Consulting
- Brown County Planning and Zoning
- Brown County Water Planning
- Brown County Soil and Water Conservation District
- Board of Water and Soil Resources
- Brown-Nicollet Environmental Health
- Cottonwood County Environmental Services
- Cottonwood County Soil and Water Conservation District
- Farm Service Agency
- Gustavus Adolphus College and Interns
- Minnesota Department of Agriculture
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Natural Resources Conservation Service

People:

- Bonnie Holz
- Bruce Lammers
- Carol Johnson
- Charlie Guggisburg
- Chris Hughes
- Dave Bucklin
- Ed Hohenstein
- Blake Honetschlager
- Greg Tenant
- Jack Bovee
- John Oltjenbruns
- Judy Hanson
- Karen Swenson
- Kathy Krzmarzick
- Kenny Elg
- Kevin Bigalke
- Lee Ganske
- Marcy Pengilly
- Mike Hanson
- Norm Holmen
- Pat Baskfield
- Paul Davis
- Scott MacLean
- Sue Anderson
- Tabor Hoek
- Tom Maher
- Tom Fisher
- Tom Peterson
- Bill VanRyswyk

Location

The Little Cottonwood River Watershed is located South Central Minnesota. The 170 mi^2 watershed lies within the Middle Minnesota Major Watershed of the Minnesota River Basin.

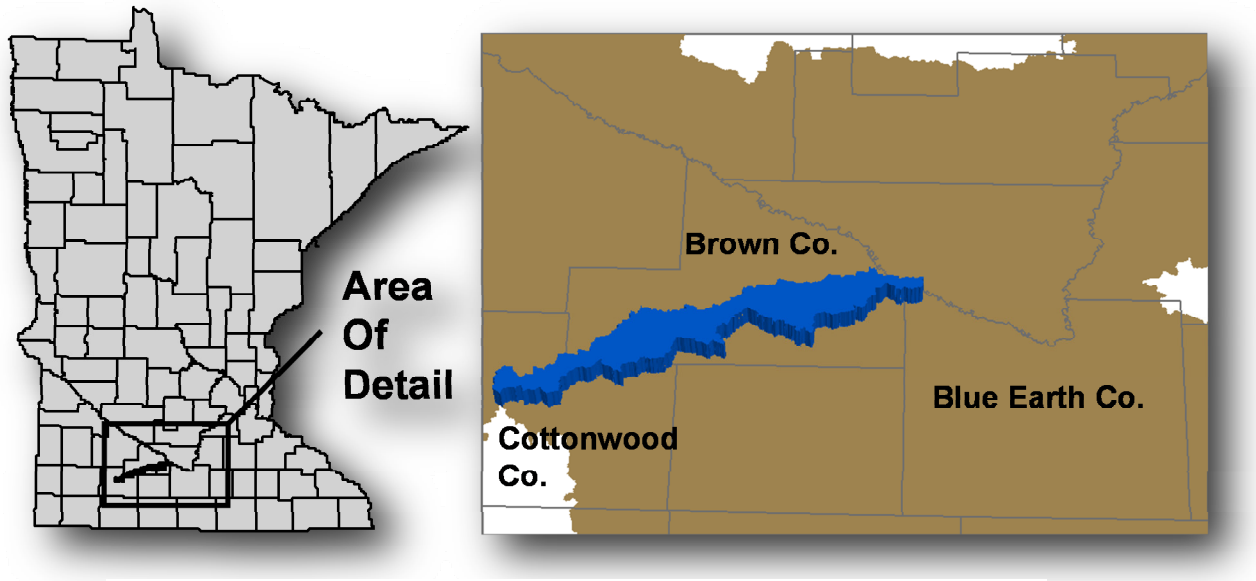
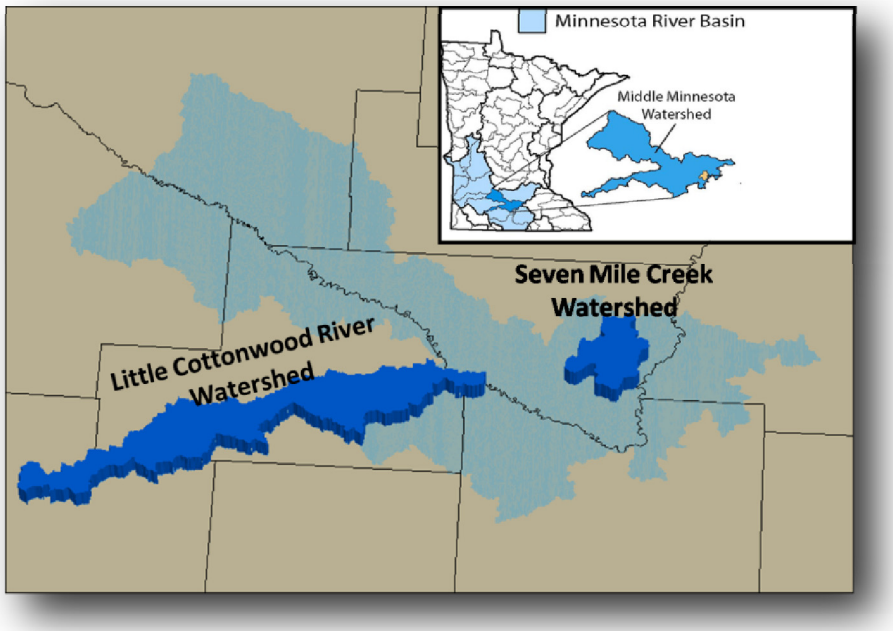


FIGURE 1-1



Unlike traditional watershed projects which tend to focus on providing additional financial incentives to landowners, this project was fundamentally different in that a majority of the project budget was devoted to fund staff that would help promote and deliver existing conservation programs to landowners and producers.

Project staff felt that many of the new and existing conservation provisions brought forth by the State of Minnesota (CREP) and 2002 Federal Farm bill (CCRP and EQIP) provided a powerful vehicle and funding mechanism for conservation. However, the programs often lacked one of the most important aspects to conservation adoption; the driver or the human element necessary to efficiently and effectively target, promote, and deliver the programs to watershed residents.

Clean Water Partnership Funding

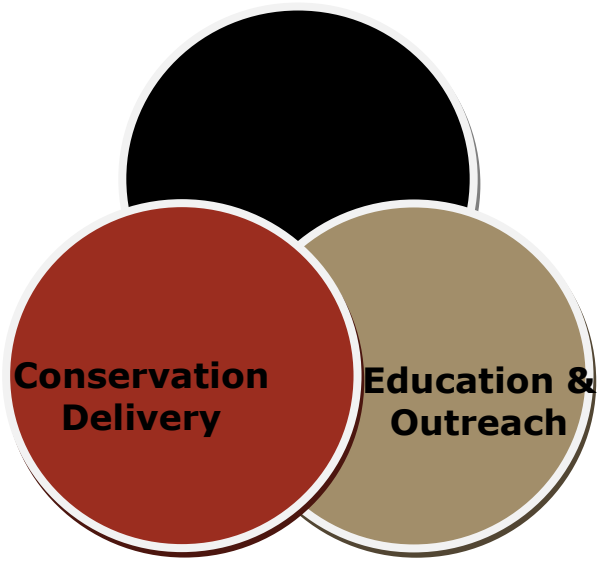
In 2000, the BNC Water Quality Board assembled a grant application to help provide the funding necessary to address some of the water quality issues documented in the diagnostic study. The funding was awarded in two parts and also granted a half- year extension to complete the project:

1. Years 2001 through 2004
    a. $297,600 grant and $150,000 in low-interest loans
    b. 100% of grant and loan application request funded
2. Years 2005 through 2007
    a. $157,696 grant and $150,000 in low-interest loans
    b. 51% of grant application request funded, 100% of loan funded
    c. Year 2008-Grant and Loan timeline was extended until June 30th 2008

Due to budget limitations, the MPCA was not able to grant the project full funding during the second phase of the project. Fortunately, the BNC WQ Board was able to secure additional funding through grants provided by the McKnight Foundation, Farm Bill Assistance and local Pheasant Forever Chapters. If it were not for the leveraging of these other grants sources it would have been very difficult to ensure staff continuity and progress during the second phase.

Key Project Focus Areas

There were three basic components that provided the framework for the LCR Implementation project. Those components included: Education and Outreach, Demonstrations and Monitoring and Conservation Delivery. All three were very important and without the other, the potential for project success would be limited.



Program Element 1 – Initial Activities

1A-Planning

- Special meetings were held with project stakeholders to discuss strategies for implementing CREP and other Best Management Practices.

1A-1 Work Plan Development

- Work plan was written and submitted to MPCA

1B-1 Hiring

- In April of 2002 the project hired Scott MacLean, Scott was a former CREP technician for Nicollet County SWCD. His main role was a watershed technician and was to help accelerate the adoption of CREP practices and CCRP practices.
- In February of 2007, Scott took another position. He was replaced by Ed Hohenstein in May of 2007.
- In September 2007, Kevin Kuehner took another position. The Coordinator position was not replaced.
- In June of 2007, Jack Bovee was hired to assist with water quality monitoring duties.

1B-2 Technical Committee Organization

- Coalition developed between Brown and Cottonwood County SWCD, NRCS, Water Planning and FSA offices.

CONSERVATION DELIVERY

Program Element 2-BMPs

2A-1 CREP

- Sent out over 250 individualized CREP payment proposals to landowners with environmentally sensitive farmland. Approximately 37 easements covering 2,300 acres were secured in the watershed.
- By 2003 this number had increased to a total of 51 easements covering 2835 acres. A majority of these acres were secured within the 100-year floodplain.
- Installed CREP signs to increase awareness of enrolled parcels.
- Provided a system by which the program was promoted through newsletters, announcements, and personal contacts with landowners.
- Interviewed landowners and developed a newsletter which highlighted CREP participant testimonials.

2A-2 RIM

- During the project period, no additional state RIM dollars were made available. Instead the Conservation Reserve Enhancement Program was used.

2A-3 CRP and Pilot Wetlands

- A GIS database of Continuous CRP eligible landowners developed. Those landowners with existing conservation easements were identified and a GIS database was developed. This was developed for land that was eligible for both CP-21 and CP27/28 practices.
- Sent over 300 proposals to individual landowners with follow-up phone calls letter and personal contacts.
- Wetland restorations were accelerated by project staff through survey and design of the site and coordination with local NRCS/FSA.

2A-4 LCR Filter Strips

- Identified priority areas that were prone to soil erosion using RUSLE2 analysis. These areas were given high priority for CRP marketing.
- Using GIS, identified all eligible landowners for CCRP CP-21 Practice. Sent proposal to each landowner followed by a phone call, letter and/or on-site visit in effort to market and increase the voluntary adoption of buffers in riparian corridors. In 2005, 51% of ditch stream miles were considered adequately buffered.

- By 2007, 65% of the LCR main stem and tributaries were considered buffered.

2A-5 Wetland Restoration

- Used CREP program to target wetlands. After CREP was completed, watershed staff emphasized CP23/a/27/28/ practices. Several wetlands have been enrolled and staff have overseen restoration efforts.
- Provide assistance to NRCS by conducting wetland topographic surveys and restoration plans.
- Coordinated 20 acre wetland restoration for the Gerald Riederer wetland project.

2A-6 Waterways

- Excessive soil loss and runoff was occurring on a cropland next to a ravine and housing subdivision. Project staff worked with the NRCS to install a 2,000 feet of grass waterway to address the issue. In addition to water quality and flood control abatement, several homes and public infrastructures projects were protected.

2A-7 Rock Inlets

- Replaced 41 open tile inlets with rock inlets. Most of the inlets were replaced in the Cottonwood County portion of the watershed.

2A-8 Conservation Tillage Demonstration

- EQIP information sent to landowners regarding practice incentives for those willing to try reduced tillage.
- There were several conservation tillage EQIP sign-ups however we were never notified the locations

2A-9 Nutrient Management

- Nutrient Management Demonstration on the Leland Haugen Farm in the Western Portion of the watershed.
- On-farm nitrogen rate demonstration on the Glen Goblirsh Farm.
- Special announcements sent to landowners to educate them on special EQIP funding opportunities for nutrient management.
- Special newsletter sent to producers which highlighted the results of the on-farm N-rate demonstrations.

2A-10 Sediment Basins

- No sediment basins were completed during this phase of the CWP.

2A-11 Lawn BMPs

- Information sent to Comfrey and Searles homeowners regarding proper lawn fertilization BMPs and the new no phosphorus state rules.

Program Element 2B-Animal waste and runoff

2B-1 Gutter Construction

- Worked with Steve Hoffman Dairy Farms to develop roof runoff management.

2B-2 Runoff Diversions

- Diverted stom water runoff from feedlot on Steve Hoffman farm. Installed sub-surface tile to divert runoff from open feedlot. Replaced open intake with rock inlet.

2B-3 Manure Storage

- Assisted NRCS and SWCD staff with Mike Selner feedlot improvement.

2B-4 Manure Management

- Demonstration project on Leland Haugen Farm comparing University Recommendations vs. conventional. Developed nutrient management plan.

Program Element 2C-Stream Banks

2C-1 Bank Seeding

- Investigated several potential stream bank stabilization sites however due to cost and limited cost-share funds, no stream banks were restored during this project.

2C-2 Stream Fencing Demonstration

A demonstration site was selected on the Fred Braulich Farm in the Middle portion of the watershed. The landowner did not use project funds, but did exclude the cattle from the stream on his own.

2C-3 Water Crossings

- No project identified

2C-4 Remote Water Systems

- No project selected

2C-5 Restoration of Active Floodplains

- A project was evaluated at the Lyle Fisher farm located in the central portion of the watershed, however due to the morphology of the site it was not cost-effective.

Program Element 2D-Impacts of sewage

2D-1 Low Interest Loans

- A total of 27 septic systems were upgraded form 2001-2004 using the low-interest loan program in the watershed. 80% of these upgrades occurred in the Brown County Portion and 20% in Cottonwood County. Average cost per system was about $6,500/system.
- An additional 10 systems were upgraded from 2005-2008 for a total of 37 systems. This was a significant decline compared to the first phase of the project.

Monitoring

Program Element 3-Monitoring

3-1 Site 4

- Developed contract with USGS to continue long-term USGS flow monitoring at the mouth. Funding from this site by MDNR Waters was cancelled in 2002. The LCR watershed project is now picking up those costs to keep the long-term class A gauging station running.
- August 2001. Electro fishing and macro invert sampling of 12 main stem locations with the MDNR Fisheries.
- A total of 200 water quality samples collected between 1996-2008. Data used to calculate pollutant loads and flow weighted mean concentrations at the mouth of the river.

3-3 Other Sites

- Wetland monitoring at Lyle Fisher Farm
- Intensive inflow/outflow wetland treatment performance monitoring conducted at the Kevin Weber CREP site
- Collaboration with William Crumpton of Iowa State University to help identify locations for nitrate reducing wetland locations. Collaborate CREP field tour with Iowa State faculty.

Education and Outreach

Program Element 4- Education and Outreach

4A-Newsletters

- Five newsletters developed and sent to watershed residents. http://mrbdc.mnsu.edu/org/bnc/pubs.html

4B-Presentations

- June-2004. Coordinated Watershed Field Day for elected officials, SWCD Board members and agency personnel. Tour focused on BMPs established in the watershed including filter strips, wetland restorations, and Steve Hoffman's flocculator milk waste treatment system. Conservation Tour- http://mrbdc.mnsu.edu/org/bnc/pdf/brownco_tour.pdf

4-B-2 Schools and Festivals

- Presentations at the annual Children's Water Festival in Mankato throughout the project timeline. Over 4,000 fourth graders from BNC counties attend the daylong event. It is estimated that about 500 watershed fourth graders participated in this program.
- Presentations to Watershed students at Lake Hanska Conservation Days.
- Assist Springfield High school students with water quality monitoring field day from 2000-2004.
- Leveraged approximately 1,000 hours for the watershed project using he Gustavus Adolphus Internship Program.

4B-3-Work with Media

- June-2004. Radio interview for KNUJ to promote CRP and EQIP in the watershed

4C-1 Middle MN and Basin Projects

- Assistance with Paired Watershed Study.

4D-1 LCR and Other Websites

- Minnesota State University was contracted to help develop and host a watershed based website. Newsletters, project updates, watershed tour, conservation programs, etc. have all been included. The website can be accessed at the following address: http://mrbdc.mnsu.edu/org/bnc/

Program Element 5-Data Management and Evaluation

5-1 GIS Projects

- Database of CRP eligible landowners and farm tracts for CP-21 and CP27/28/23 practices.
- Inventory of buffers along streams, ditches and main stem in the watershed. Used to target landowners eligible for filter strips.
- GIS used to identify potential wetland restoration sites in the watershed.
- Developed poster of watershed accomplishments
- Developed conservation practice tracking system

5-2 GIS Results

- Documentation of BMPs including location, type and other related attributes.

5-3 Technical Committee

5-4 Reporting

- All Little Cottonwood monitoring sites have been established in STORET.
- Activities for 2004 reported in eLINK. Prior to 2004, activities in watershed reported in LARS.
- Semi-annual reports.
- Estimated pollutant loads provided to PCA for inclusion in the annual State of the Minnesota River Report.

Program Element 6-Administration

6-1 Communications

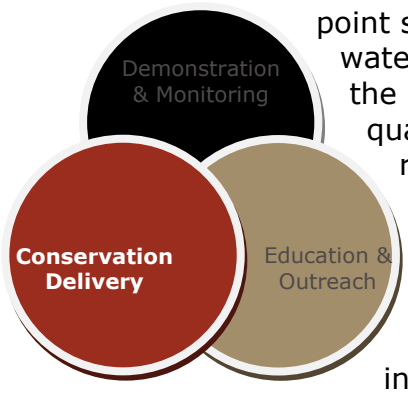
- Semi-annual Joint Powers Board meetings were held to communicate the status of implementation.
- Updates to the Minnesota River Board

6-2 Fiscal Management

- Developed accounting program for grant expenditures and progress reports.

6-3 Project Direction

- Provided presentations to Water Quality Board staff regarding the future of the project and recommendations on how to continue.



The Phase I diagnostic study (1997-2000) indicated reductions in non-point sources of sediment, nutrients and pathogens throughout the watershed would contribute to improvements to the main stem of the Little Cottonwood and Minnesota River. In addition to water quality impairments, flooding was found to be the biggest resource issue for watershed residents. The technical committee identified several actions which would help lower non-point sources of pollution in the watershed while at the same time reduce flooding impacts. Some of the programs and Best Management Practices (BMPs) that were used to help address these water quality impairments are highlighted in this chapter.

Unlike traditional watershed projects which tend to focus on providing additional financial incentives to landowners, this project was fundamentally different in that a majority of the project budget was devoted to fund staff that would help promote and deliver conservation programs to landowners and producers. Project staff felt that many of the new and existing conservation provisions brought forth by the State of Minnesota (CREP) and 2002 Federal Farm bill (CCRP and EQIP) provided a powerful vehicle and funding mechanism for conservation. However, the programs often lacked one of the most important aspects to conservation adoption; the driver or the human element necessary to efficiently and effectively promote, target and deliver the programs to watershed residents.

Through the CWP, funding was used to employ a 0.75 full-time employed technical service representative and a 0.5 full time employed coordinator/liaison. Due to limited funds, the grant request from MPCA was cut short by nearly $100,000 during the second extension period; therefore the feasibility of hiring full-time staff was not an option. Fortunately, the BNC WQ Board had several other grants that could keep the coordinator and technician funded at full time throughout the project. In 2003, additional funding was leveraged from a Farm Bill Assistance Grant administrated by the Board of Water and Soil Resources to also assist with

'this project was fundamentally different in that a majority of the project budget was devoted to focus on the staff that would help promote existing conservation programs to landowners and producers.'

helping keep project staff funded at a full-time level. This funding was also used to help extend the technician position into 2008 and also expand their efforts into other watersheds of the Middle Minnesota Major Watershed.

The Technical assistance representative and the Conservation Liaison were found to be extremely important to the watershed project. These positions were critical for

strengthening and leveraging programs and partners, assisting landowners with conservation programs such as promotion, outreach, design, construction, and maintenance of conservation programs, as well as developing and sustaining personal relationships and trust among watershed landowners, farmers and contractors. These local watershed-based positions acted as a bridge between federal and state programs, crop consultants, drainage industry, and the landowners and farmers that could benefit from them. These positions worked very closely with the Soil and Water Conservation Districts, Local Water Planners, Farm Service Agency, Natural Resources Conservation Service and State agencies like the Board of Water and Soil Resources. The success of this approach is represented by the substantial adoption rates of the Conservation Reserve Enhancement Program (CREP) and Continuous Conservation Reserve Program (CCRP).

Technical Service Representative (TSR)— Employed through the local Soil and Water Conservation Districts and/or Water Quality/Watershed Organization. This person has a working knowledge of all the conservation programs and conservation planning principles. This position helps promote, target and deliver these programs to landowners and farmers. This person also coordinates the installation, maintenance and overall follow-up of the conservation program.

Conservation Liaison (CL)— This person has a working knowledge of all responsibilities associated with the TSR but also helps strengthen communication among local, state and federal agencies and other private organizations. This person also helps leverage other programs, grants and partners and helps streamline and improve the efficiency of delivering conservation practices where they are needed. This person helps maintain and build trust among all that have a stake in the sustainability of the watershed and its resources.

Accelerating the Adoption of Cropland Retirement Programs using a Targeted Approach

In 1998, the largest, private-lands conservation effort in Minnesota began on the Minnesota River; one of the nations's most polluted. The purpose of the effort was to improve the river's water quality, reduce the impacts of flooding and restore wildlife habitat. The initiative proved to be very successful with over 100,000 acres enrolled into permanent conservation easements by 2003. The Conservation Reserve Enhancement Program (CREP) will most likely be known as one of the most successful and important initiatives in Minnesota's conservation history to improve water quality and habitat.

LCR Watershed assessments identified numerous areas where active floodplain was farmed very close to the main stem of the LCR and its tributaries. These land use practices increased the potential for downstream flooding, and nutrient and sediment loading to the river. The availability, timing, and purpose of CREP appeared to be a perfect fit for these areas. The watershed technical committee also felt that most landowners would consider a perpetual conservation easement program like CREP since watershed flooding seemed to be an all too common occurrence over the past several decades. Geographic Information Analysis (GIS) analysis indicated that over 4,500 acres of marginal agricultural land was eligible for the CREP program within the 100-year floodplain of the river.

In April of 2001, CWP funding was used to hire a watershed technician to promote the program and provide additional technical assistance to the Soil and Water Conservation Districts which were responsible for administrating CREP. The watershed coordinator also provided additional assistance for this effort and served as the liaison between the landowners and the various state and federal agencies that helped administer the program.

The Minnesota River CREP combined the U.S. Department of Agriculture's Conservation Reserve Program (CRP) with the state's Reinvest in Minnesota Reserve Program (RIM) to permanently set aside environmentally sensitive land in the 37-county Minnesota River Basin.

From 2001-2004, intensive marketing and technical assistance was provided to help accelerate the enrollment of these environmentally sensitive areas. Using GIS and watershed field surveys, staff focused their outreach to landowners with cropland within the 100-year floodplain, riparian areas along drainage ditches/perennial streams and upland wetland restorations. Special emphasis was placed within the Brown County portion of the LCR Watershed since this area appeared to have a

greater potential for voluntary adoption and more opportunities to address flooding concerns.

The promotion of CREP to watershed landowners was facilitated in three phases. The first phase consisted of an initial letter to all county landowners advertising CREP and the staff that would be assisting with it. The county mailing was then followed by a more detailed letter which provided a dollar per acre calculation using GIS digital ortho-photos, and soil maps. These proposals consisted of an air photo with the CREP eligible acres outlined and the respected amount of monetary compensation the landowner could receive if enrolled into the program. The mailings were sent to all eligible landowners in the watershed. This resulted in a client database of about 275 landowners and 125 renters. The most important phase consisted of the personal outreach and follow-up. This consisted of phone calls and follow up visits to help answer any questions and to facilitate the technical and administrative enrollment process. A significant portion of staff time and resources was devoted to this final program element. After CREP expired, a similar technique was used to market and accelerate the adoption of federal Continuous Conservation Reserve Program practices.

CREP adoption rates resulting from the project

BEFORE (1998-2000) = 11 easements, 381 acres

AFTER (2001-2003) = 52 easements, 2,835 acres

The outstanding success of this initiative is represented by the locations of CREP easements which were enrolled from 1998-2003 (Figure 3-1). A total of 52 easements covering 2,835 acres of perpetual conservation easements were enrolled within the watershed. Prior to the start of the implementation phase of the LCR project, only eleven easements covering 381 acres were enrolled into the program. The assistance of additional watershed staffing resources helped increase the amount of CREP easements by 2,135 acres or a 305% increase. The LCR watershed project had some of the highest adoption rates within the Middle Minnesota Major Watershed nearly 60% of the CREP acres within Brown County were located within the LCR watershed. Targeting also proved to be successful. A total of 1,274 acres (45%) were located within the 100-year flood plain. Sixty percent (60%) of the easement acres were classified as wetland restorations and forty percent (40%) were classified as riparian buffers.

These perpetual conservation easements will significantly help reduce downstream water quality and flooding issues. Without more in-depth analysis it is difficult to accurately quantify the amount of sediment, nutrient and peak flow reductions that are associated with these easements, but a very rough approximation can be calculated. The following assumptions were used: average annual soil loss is reduced from 5 tons/acre/year to 1 ton/acre/year, 1.25 lbs. enriched phosphorus/ton of soil and a average delivery ratio of 20%, and nitrate reduced from 20 lbs./acre/year in well drained cultivated soils to 2 lbs./acre/year. Using these broad assumptions, it is estimated that about 11,000 tons of soil is conserved, and helps prevent an estimated 2,800 pounds of phosphorus and

51,000 pounds of nitrates from entering the river each year. These reductions could translate to a 10-12% reduction in annual sediment and nutrient loads to the Little Cottonwood River every year.

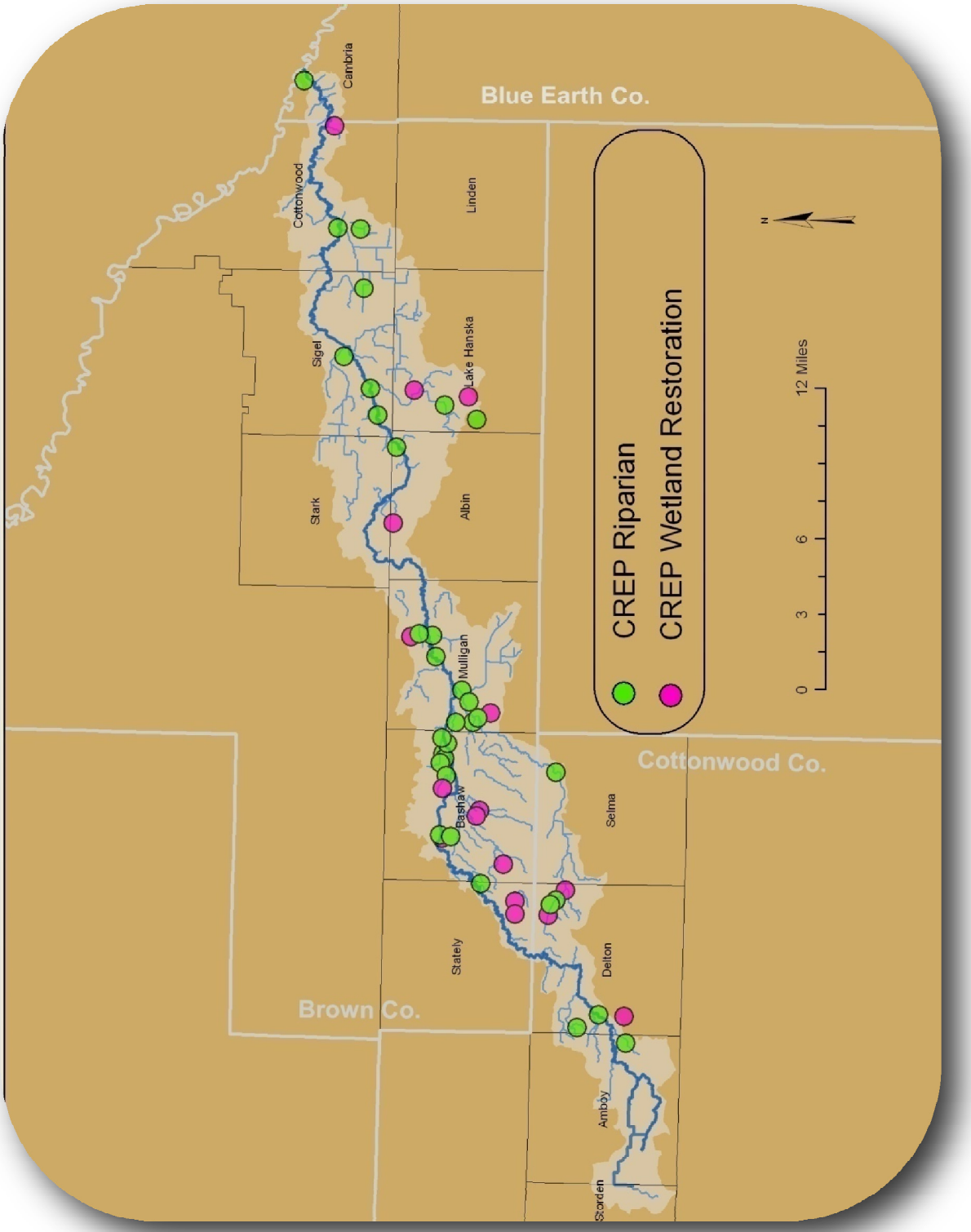


FIGURE 3-1-ILLUSTRATION OF CREP EASEMENT LOCATIONS AND TYPE

Roland Richert, of Bashaw Township, has enrolled 116 acres of his land in CREP. "It's marginal cropland. In wet years the bottomland would flood and the sandy soil would produce. During dry years the bottomland would produce but the sandy soil would burn. In the best years, this was 170-bushel corn, but with more frequent flooding CREP became a lifesaver. It saves so much soil from getting into the Little Cottonwood River," Roland said, "and is really attracting the wildlife." "There are so many more pheasants out there, and the deer love to run and hide in that tall grass. I really like to walk and look at the wildflowers too. Wildlife needs room too, so I gave some to them. CREP is still farming, just in a different way," states Roland. Richert was one of the first landowners in Brown County to participate in CREP.

Gerald and Lorrel Riederer have their reasons for enrolling land in a conservation program. "The 10-acre area I enrolled in CREP sits along the Little Cottonwood River and used to be really good hay meadowland when we had cattle. I liked going to that area of the farm, since it was so serene," said Gerald. "After we sold the cattle we had no need for the hay, but still needed to provide income. So, about 20 years ago we converted it into a corn and soybean field. Because of flooding, and washing problems, the low bottom ground set us back in the spring. After our retirement from farming our renter faced the same problems so he actually recommended CREP to me."Gerald liked the idea of conserving the land and seeing it go back to its natural state while keeping it in the family. "The Riederer farm is a century farm so keeping it in the family was important to us," he said. Gerald also recently enrolled about 15 acres in a U.S. Department of Agriculture wetlands conservation pilot program. This program, known as the Farmed Wetlands Program (FWP), allowed landowners to enroll small wetland areas and adjacent buffers in the Conservation Reserve Program (CRP) for 10 to 15 years. The program was intended for cropped wetland basins located upland and no bigger than five acres. FWP proved to be a valuable tool for many Brown County farmers since it helped them manage wet areas consistently, while improving water quality and wildlife habitat. Gerald found out about FWP when the Little Cottonwood River Watershed group and the Natural Resources Conservation Service sent out proposals to eligible landowners. "I really couldn't see any reason not to enroll in the program. Even with tiling, I have always had drainage problems with those areas," notes Gerald. "In some years I had to wait for the ground to freeze before I could get the corn out. I was going to add more tile, but the idea of being able to square off the field, along with the competitive CRP rental rates, convinced me otherwise." When asked what the site will be like in the future, Gerald replied, "The grasses will be great for pheasant cover. There was good hunting when I was a kid, but not anymore. I really miss hearing the crow of a pheasant in the morning. Hopefully I can help bring that back."

Accelerating the Adoption of the Continuous Conservation Reserve

Soon after CREP expired in 2003, focus was adjusted to the promotion of the Federal Continuous Conservation Reserve Program (CCRP). Unlike the perpetual CREP program, CCRP allows landowners to enroll environmentally sensitive cropland areas into a *temporary* 10-15 year set aside program. In return, the landowner receives annual rental payments. Similar to CREP, project staff targeted cropland along riparian corridors and drainage ditches and also small farmed wetlands that were less than 10 acres in size. Two popular CCRP practices that were used for this effort included filter strips (CP-21) and the Farmable Wetland Program (FWP) (CP27/28) practice. The FWP program was a new pilot program authorized through the 2002 Federal Farm Bill. It allowed landowners to restore small, farmed wetlands. In 2003, staff also assisted landowners with enrolling larger, highly erodible blocks of upland crop fields into the general CRP program. Landowners which hesitated with CREP due to concerns associated with the permanent easement now had another option to consider. Using GIS, all landowners that were considered eligible for these programs were selected and a database was developed. Over 600 proposals were sent out to those landowners. From 2003-2006 a Farm bill Assistance Grant was acquired to help supplement this effort in the LCR watershed by providing additional funds for the Technician and Liaison positions.

The effectiveness of this initiative was also very successful. From 2003-2006 a total of 700 acres of new CRP practices were installed. Figure 3-2 illustrates the locations of these practices. 57% of the acres were classified as general upland contracts with the remaining 43% split equally between filter strips and wetland restorations. Using similar sediment and nutrient reduction assumptions that were used for the CREP, it is estimated that about 600 tons of soil is conserved, and helps prevent an estimated 700 pounds of phosphorus and 13,000 pounds of nitrates from entering the river each year.

No additional CCRP acres were added as a result of this project from 2007-2008. Two primary factors help explain this. First, by mid 2007 there was staff turnover in both the technician and coordinator positions. The technician position was re-hired in May of 2007; however due to re-organization and budgetary constraints the coordinator position wasn't rehired. Secondly, and perhaps most importantly, 2007 marked the year for a significant change in the farm economy. Global and regional supply and demand conditions for commodities led to significant price increases for corn and soybeans. Consequently, land rental rates and land prices also increased significantly. In 2008, the average CCRP rental payment in the LCR watershed was $145/acre while actual rental rates paid for cropland in the watershed is around $200 or more per acre. In summary, the recent volatility associated with crop and land pricing trends decreased interest in the voluntary adoption of conservation set-aside programs.

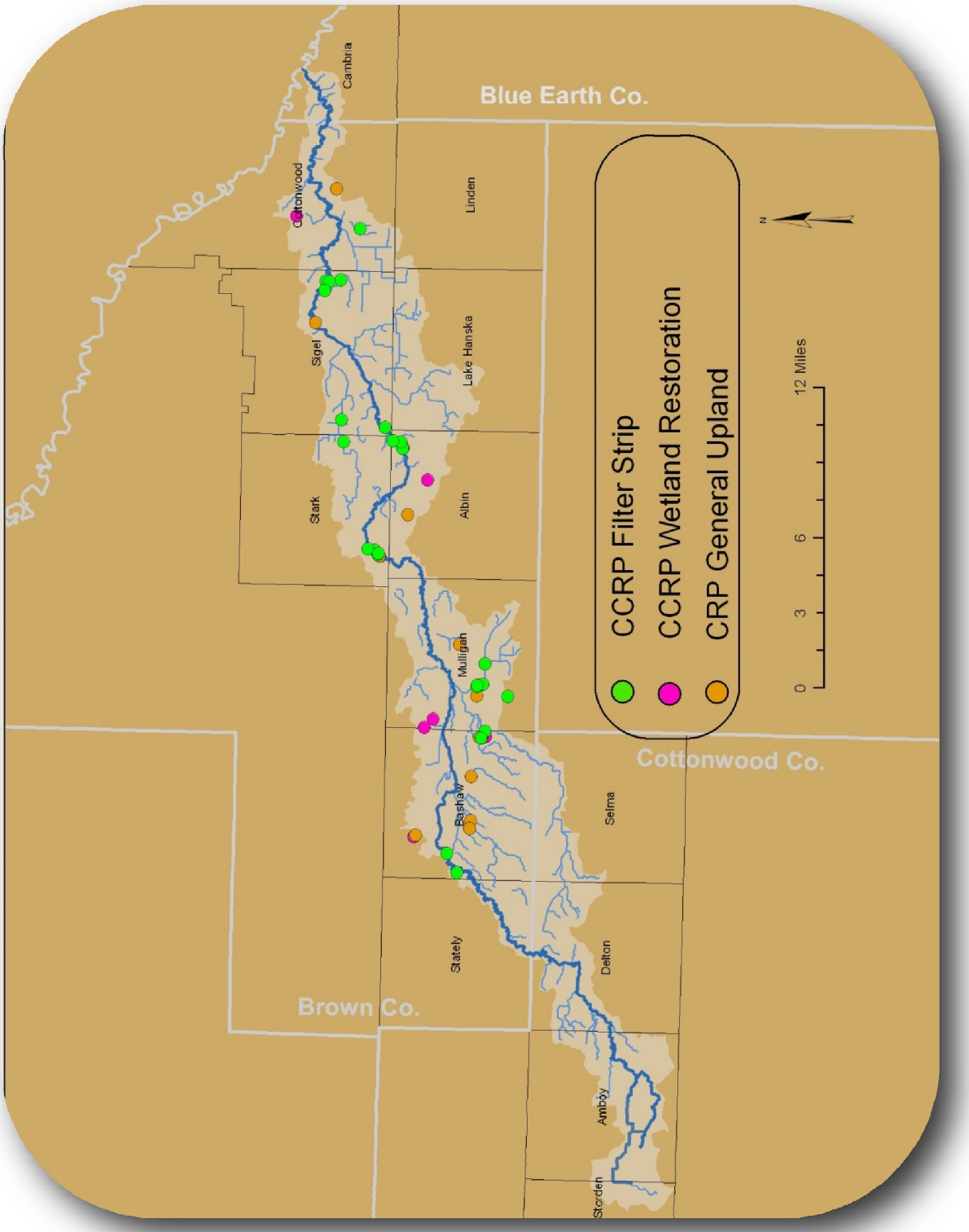


FIGURE 3-2-ILLUSTRATION OF PROJECT INITIATED CRP ACRES

Gary Rathman, a landowner in Mulligan Township, enrolled a 122-acre field in the U.S. Department of Agriculture's Conservation Reserve Enhancement Program (CREP) and Continuous CRP to increase the bio-diversity on his farm through prairie restoration. When it comes to prairie restoration and wildflowers Gary Rathman has done his homework. "I wanted to restore what was once on my land," states Gary. "I felt the CREP and CRP was intended to help restore what was once part of the original landscape. In the case of my land it was prairie." In just one year—and with the help of the watershed project, local Soil and Water Conservation District (SWCD), the Natural Resources Conservation Service, the Minnesota Department of Natural Resources, prairie seed dealers, and some studying—Gary has turned part of his farm from a corn/soybean field into a very diverse ecosystem. "When I heard about the program I became interested, and after learning more I decided to participate in the program," Gary said. After enrollment at the SWCD office in Sleepy Eye, he spent most of the 2001 winter planning the project and selecting what to plant. "I wanted my land to be as diverse as possible. I wanted to attract as much wildlife as I could. Hopefully one day when I look out at my field from my house I will not only have prairie chickens, partridge, and pheasants back on my land, but many types of small creatures like butterflies as well." Gary knew he had to plant variety to get variety. He planted more than 248 native species of wildflowers and 23 native species of grasses. Gary's planning is already paying off. In just the first year, hundreds of wildflowers bloomed during the summer, and the short and tall prairie grasses have started to take hold. Gary's CREP-supported prairie restoration was feature at the Brown County Watershed Conservation Tour in August 2003. The Rathman farm is located in the Little Cottonwood and Watonwan River Watersheds.

Marvin and Esther Windschitl

Regular flooding and poor yields were enough to make Marvin and Esther Windschitl look for an alternative to cropping some of their farm land. "The area is close to the Little Cottonwood River. When the river would rise, about 20 acres would flood out. We would only get a crop off of it about once every five years. The land is even too low to tile." For Marvin, enrolling some of his land in CREP made good sense. The area that occasionally produced corn and soybeans has now been planted to about 60 acres of native prairie grasses that will help reduce erosion and agricultural runoff. The decision to enter CREP will not only help the water quality of the Little Cottonwood River, it will also improve Marvin's bottom line. The trend toward larger and larger equipment also influenced Marvin's decision. "It's an odd shaped field, so it's hard to get into it with larger equipment

Riparian Buffer Summary

Increasing riparian buffers along the Little Cottonwood and its tributaries was a very high priority during this six year project.

'an additional 60 miles of buffers have been established within the watershed in less than six years'

There are a total of 158 miles of streams and tributaries in the LCR Watershed. It is estimated that prior to the adoption of project related CREP and CCRP, about 43 miles or 27% of the LCR main stem and its tributaries were buffered from cropland(>40 feet of perennial vegetation). Through the combined efforts of the watershed project and its partners, the amount of buffers in the watershed has increased substantially. Remarkably, GIS and field surveys indicate that 103 miles or 65% of the riparian corridors within the watershed are adequately buffered with perennial vegetation (Figure 3-3 and 3-4). This indicates an additional 60 miles (140% increase) of buffers have been established within the watershed in less than six years. Although a significant portion of the tributaries have been buffered, there are still many opportunities in the lower portion of the watershed. Additional targeting of buffers include the following public county drainage ditch systems: CD11, CD58, CD67, CD68, and CD70.

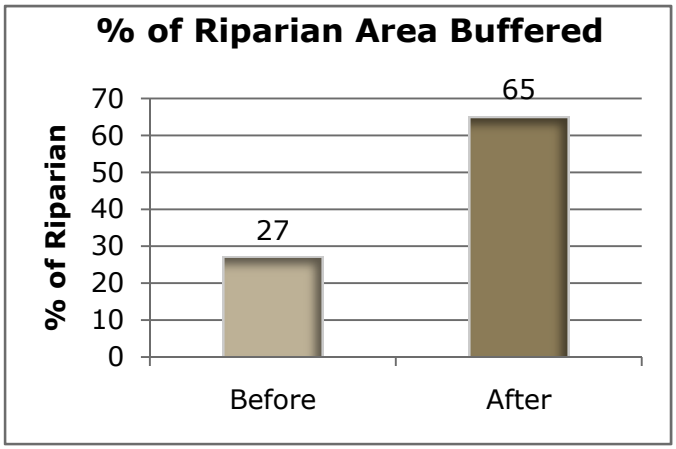


FIGURE 3-3-COMPARISON OF RIPARIAN BUFFERS BEFORE AND AFTER THE PROJECT

Figure 3-4 illustrates the significant level of buffer adoption by landowners within the watershed. This map compares the buffer status of riparian corridors within the watershed prior to the start (pre-2002) of the watershed project and after the watershed project was completed (2007). Tributaries which are coded green are considered adequately buffered from active cropland and have perennial vegetation on both sides, orange one side, and red indicates that the riparian corridor in not adequately buffered from cropland (<40 feet of perennial vegetation). This analysis does not include the Cottonwood and Blue Earth County portions of the watershed.

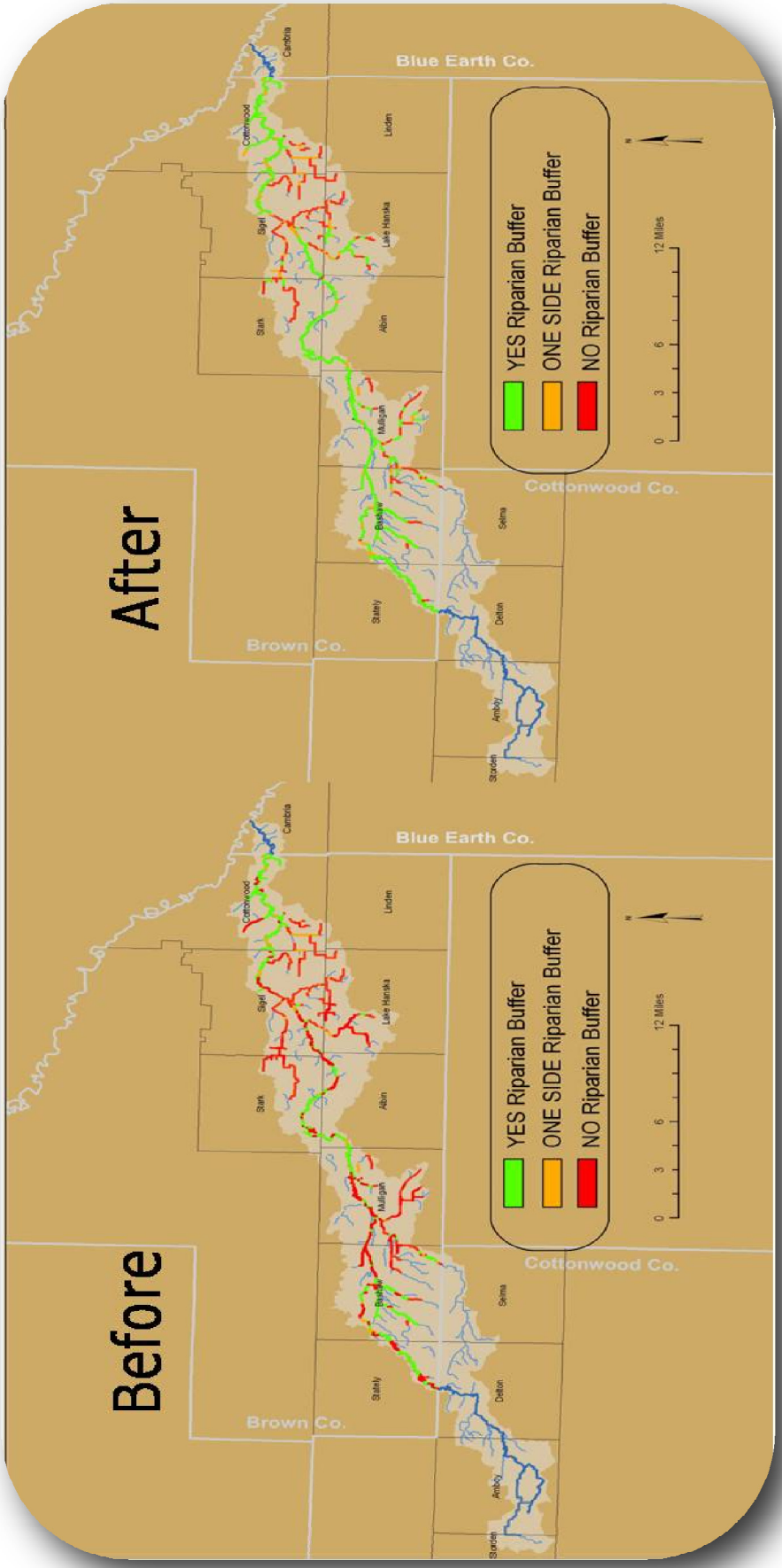


FIGURE 3-4- ILLUSTRATION COMPARING RIPARIAN BUFFERS BEFORE AND AFTER THE PROJECT

Development of Cropland/Ravine Interface Conservation Buffer Practice

Conservation programs like CREP and CRP were used to target two environmentally two sensitive features in the watershed:

1. cropland within the 100-year floodplain and
2. cropland within thirty feet of drainage ditches and tributaries.

As the project progressed it was realized that a third environmentally sensitive feature existed in the watershed and should also be targeted. This area was called the cropland/ravine interface. This feature is found along cropland areas next to the steep ravines in the lower portion of the watershed. Typically sub-surface drainage tiles are outletted into these locations from the upland and fields are cropped to the edge of the ravine. These practices can increase the potential runoff issues; however there are two very effective practices that can be installed to help reduce this source of non-point source pollution. A vegetated buffer strip can be placed along the perimeter of these areas to reduce and filter overland runoff and grade stabilization structures can be installed to provide a stable outlet for the tile. To work properly they must be used in conjunction with another. Unfortunately, during the project implementation phase a Continuous sign-up CRP buffer practice did not exist for these areas.

Farm Program Fact Sheet *April 2008*
Minnesota CP38E—Back Forty Pheasant Habitat

Land Eligibility Criteria

Offered land must be:

- Cropland that meets current CRP cropping history requirements;
- Physically & legally capable of being planted to an agricultural commodity in a normal manner (pastureland is not eligible); and
- Physically located within the designated SAFE area
- Otherwise eligible.

Practice Requirements

CP38E offers may be:

- 10 to 40-acre blocks within a tract or adjacent tracts, including adjacent tracts of different ownership;
- Small fields (<10 acres) adjacent to existing habitat that collectively form a minimum of 10 acres of habitat;
- Center-pivot irrigation corners (<40 acres), or
- Cropland-ravine interface areas (<40 acres)

Payments

Annual Rent

In return for establishing long-term, resource-conserving covers, FSA provides annual rental payments to participants. FSA bases rental rates on the relative productivity of the soils within each county and the average dry land cash rent or cash rent equivalent. In addition, a maintenance rate is added to the annual rental rate and the maximum per-acre annual rental rate is calculated in advance of enrollment.

Cost-share Assistance

FSA provides cost-share assistance to participants who establish approved cover on eligible cropland. The cost-share assistance can be no more than 50 percent of the participant's cost to establish approved practices.

Additional Financial Incentives

In addition to the annual rental payment and cost-share, FSA offers eligible participants the following incentives:

- A one-time signing incentive payment (SIP) of $100 per acre for each SIP-eligible acre enrolled; the SIP will be issued after the contract is approved and all payment eligibility criteria are met; and
- A one-time practice incentive payment (PIP) equal to 40 percent of the eligible installation costs for PIP-eligible acres enrolled; the PIP will be issued after the practice is installed, eligible costs are verified, and other payment eligibility criteria are met.

Examples of Eligible Acres

CP38E Practices:

Irrigation Corners:

Cropland-Ravine Interface:

For more information on SAFE sign-up, contact your local FSA office.

www.fsa.usda.gov/mn

2

In 2007 the watershed project worked with the state Pheasants Forever Chapter, Natural Resources Conservation Service, Farm Service Agency and Board of Water and Soil Resources to develop a special CRP practice that would allow these special areas to be eligible for sign-up. The LCR project was notified that their efforts were successful and a special Continuous CRP practice was created specifically for the cropland/ ravine interface. The CP38B practice became available to watershed landowners in April of 2008.

Conservation Easement Summary

With funding provided by the Clean Water Partnership Program collaborative efforts began in 2001 to help accelerate the adoption of conservation programs. The approach was to use new or existing programs and emphasize additional technical assistance rather than incentives.

One of the main programs emphasized in this watershed was the promotion of permanent conservation easements (CREP), within the 100-year floodplain.

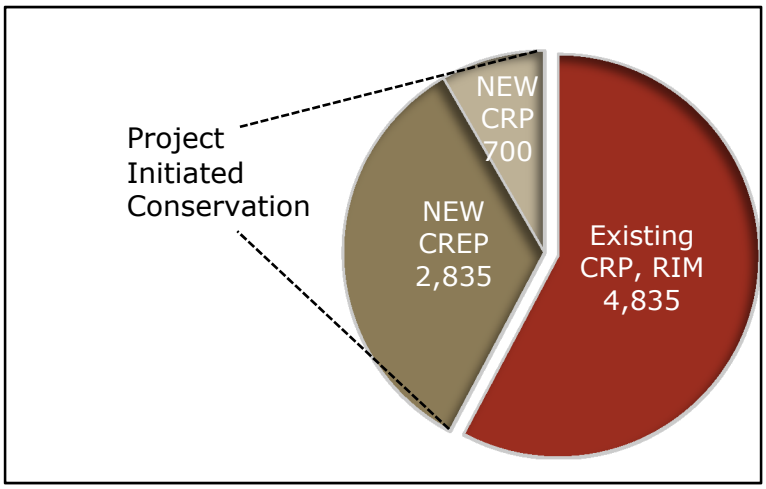


FIGURE 3-5- COMPARISON OF EXISTING AND PROJECT INITIATED CONSERVATION ACRES

- A total of 52 easements consisting of 2,835 acres of marginal or environmentally sensitive cropland acres were enrolled into CREP.
- 45% or 1,274 acres of the CREP easements were located within the 100-year floodplain of the Little Cottonwood River.
- Of the remaining, 1,068 acres of easements are located on frequently flooded soils (wetlands) or along riparian corridors like streams and drainage ditches.

After the CREP program expired in 2002, special efforts focused on helping target environmentally sensitive cropland areas using the Continuous CRP filter strip and farmable wetlands program (FWP).

- A total of 700 acres of additional environmentally sensitive cropland was enrolled into theses two programs from 2003-2006.
- About half the acres were associated with filter strips and the remaining acres were associated with wetland restoration and upland buffers.

Efforts by the watershed project and partners resulted in a 73% increase in the amount of new conservation practices adopted from 2001-2007.

- As of 2007, a total of 8,335 acres of cropland has been enrolled into conservation programs within the watershed (figure 3-6). This represents 8.6% of the total eligible cropland acres in the watershed. About 44% of those easements are permanent and the remaining are temporary ten or fifteen year programs.
- The project helped promote an additional 3,535 acres of new conservation
    - Acres of existing CRP/RIM or other set aside program =4,835, new CREP = 2,835, new CRP = 700
- Collaborative efforts to encourage riparian buffers has resulted in 60 additional miles of vegetated buffers along the main stem of the LCR and its tributaries.

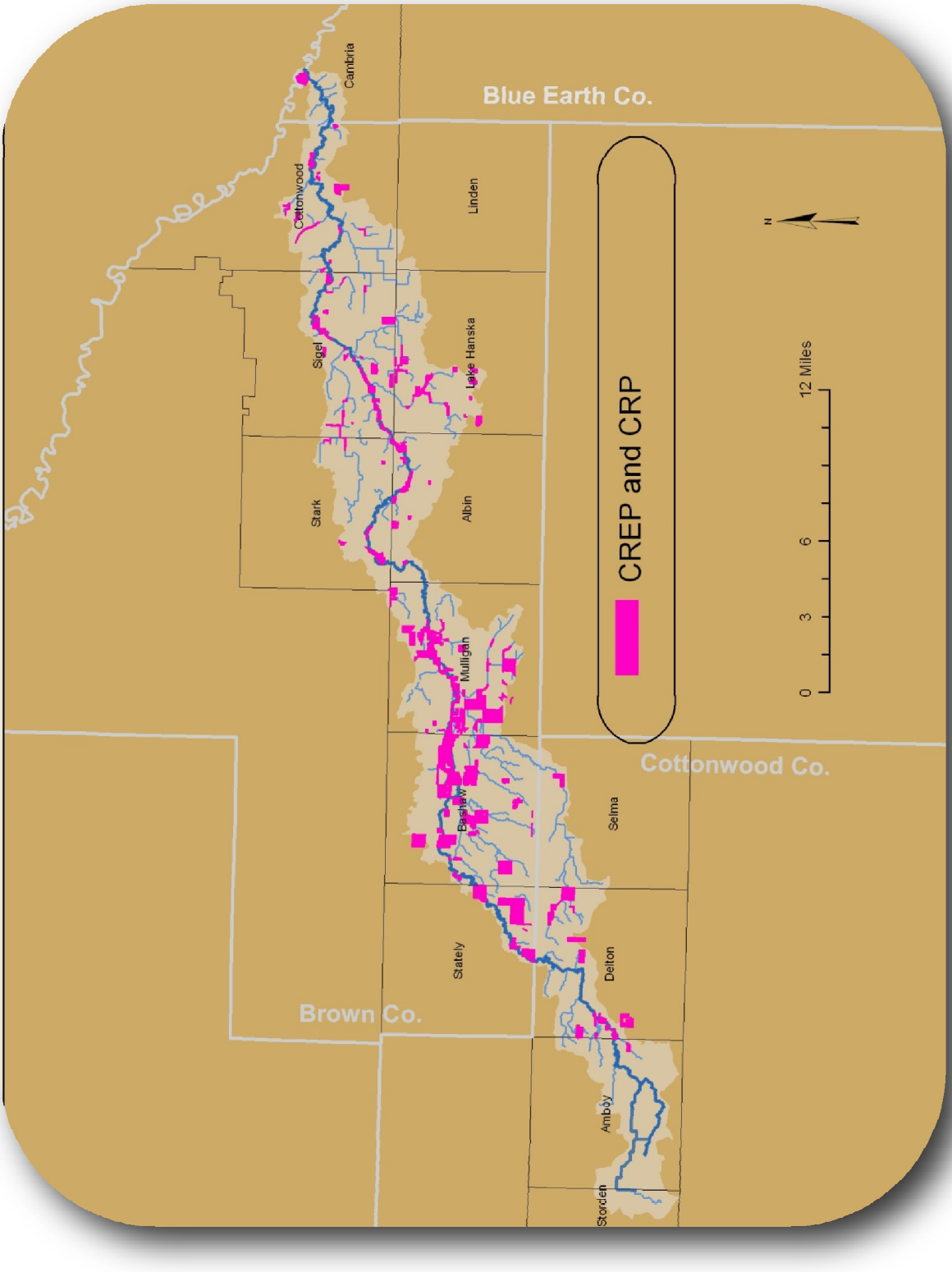


FIGURE 3-6-ILLUSTRATION OF PERMANENT AND NON-PERMANENT CONSERVATION EASEMENTS WITHIN THE LITTLE COTTONWOOD RIVER WATERSHED

Septic Systems

Upgrading non-compliant septic systems was another priority for the project. This effort was an attempt to help reduce pathogenic bacteria sources to the LCR since most non-compliant systems are hooked directly to a sub-surface drainage tile which then discharge into the nearest road or county drainage ditch.

To help accelerate the adoption of septic upgrades, low interest loans (2%-4%) were made available to rural watershed homeowners in Brown and Cottonwood County. The loans were administrated by the respective Planning and Zoning/Environmental Services offices. The LCR project received $150,000 in loan funding during the first grant period (2001-2004) and an additional $150,000 during the second period (2005-2008). A total of $200,000 was allocated to Brown County and $100,000 to Cottonwood County. Due to weak demand in Cottonwood County and strong demand in Brown County, $25,000 in unused loan funds was transferred from Cottonwood to Brown County in 2007. Most of the administrative duties associated with the program were coordinated by the Brown and Cottonwood Planning/Zoning Departments. Watershed staff played an important role in advertising the program. Most of this entailed advertising the program in local newspapers and direct mailings of materials to watershed residents. Outreach materials were centered on the economic advantages of the loan program and compliance with local and state laws. For instance, homeowners were made aware that they could save an average of $700 to $1500 in interest over the life of the loan and were also made aware of the new straight pipe rules.

As of 2008, it is estimated that there are a total of 461 rural residences with individual waste water treatment systems located within the LCR watershed. Prior to the watershed project it was estimated that about 111 residences were considered compliant within the watershed. This resulted in a compliance rate of 24%. Due to the low-interest loans provided by the watershed project, an additional 37 septic systems were upgraded from 2001-2008. This increased the compliance rate from 24% to 32%.

Figure 3-7 and Figure 3-8 summarize the progress that has been to upgrade septic systems within the watershed. These data do not count the small portion located in Blue Earth County. Of the $300,000 in low-interest loans that were allocated to the project, 70% of the funds were utilized. A total of $89,124.65 was not utilized. Figure 3-7 represents the spatial distribution of rural residences within the watershed and septic system compliance status as of early 2008. The yellow markers indicate the locations of homes that utilized the special low–interest loan program offered by the watershed project.

Although some progress has been made in the watershed to fix non-compliant systems, there is still more room for opportunity. Some of the obstacles faced by project staff consisted of the following:

1) Interest rates were relatively low during the project period so there was little incentive to use the watershed program.
2) The watershed project received the loans from the MPCA at a 2% interest rate. However, each County administers the program differently and ultimately different interest rates are used to help cover local administrative costs and length of payoff periods. For instance, Cottonwood County uses a interest rate of 3% and a payoff period of ten years. However, Brown County uses an interest rate of 3.5% and payoff period of five years. To some homeowners, this program was not enough of an incentive.
3) Due to rising fuel prices, septic system costs increased by 10-20% during the project time period.
4) Lack of staff to ensure that all systems are routinely inspected and certified compliant according to state and local rules.

County	Number of Systems	Total Loan Amount
Brown County	30	$173,150.74
Cottonwood County	7	$37,724.61
TOTAL	37	$210,875.35

FIGURE 3-4-SUMMARY OF SEPTIC SYSTEM UPGRADES AND CWP LOW-INTEREST LOAN DOLLARS USED

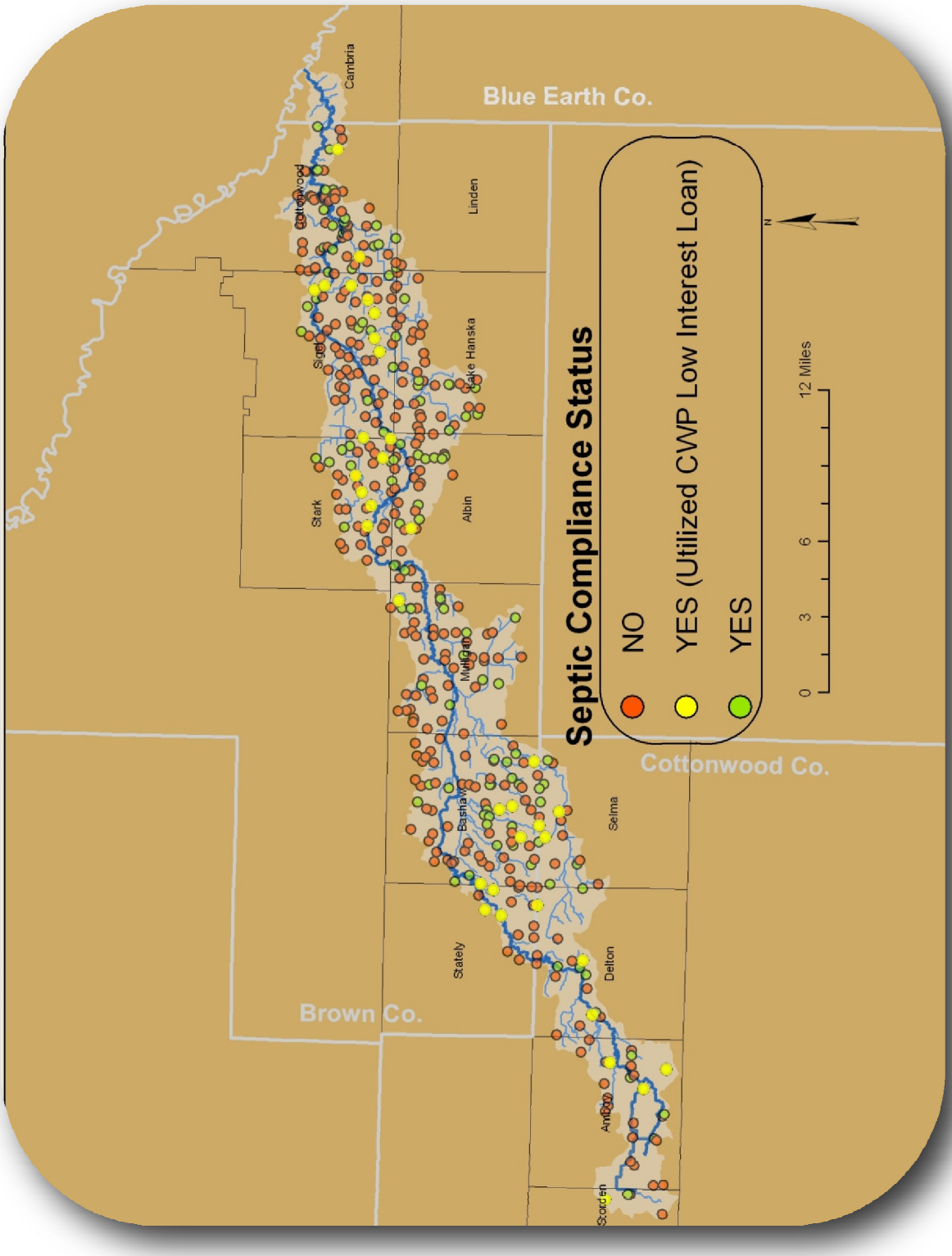
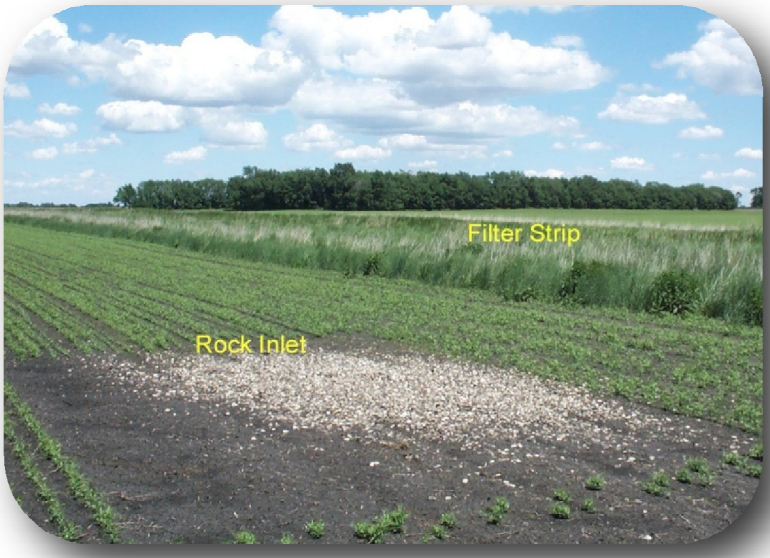


FIGURE 3-8- ILLUSTRATION OF SEPTIC SYSTEM COMPLIANCE STATUS AND LOCATIONS OF PROJECT SPONSORED UPGRADES

Replacement of Open Intakes

A common drainage practice in this watershed is the installation of open tile intakes in poorly drained areas of crop fields. These open intakes are typically placed in small depressions to collect surface runoff and provide better drainage for the field. Although effective at removing excess water from the crop field it can also be effective at increasing the likelihood of sediment and phosphorus delivery to the LCR to runoff conditions. It is estimated that there are about 10 open intakes per square mile within the watershed or total of 1,500 open intakes. As an alternative practice, landowners can replace the open intakes with a rock inlet. A rock inlet is designed to help provide drainage, but also help reduce the delivery of sediment and phosphorus to the sub-surface drainage system. The cost for replacing open intakes with this type of practice is about $300-$500. During the implementation phase of the LCR project, a state or federal cost-share program did not exist to help cover these replacement costs. The LCR project set aside $6,000 from the CWP budget to help accelerate the awareness and adoption of this practice. The program provided 75% cost-share not to exceed $300 per intake replaced. This program was very popular and within just two years the budget was expended. Figure 3-9 illustrates the locations of the open intake replacements. A total of 41 intakes were replaced from 2001-2005.



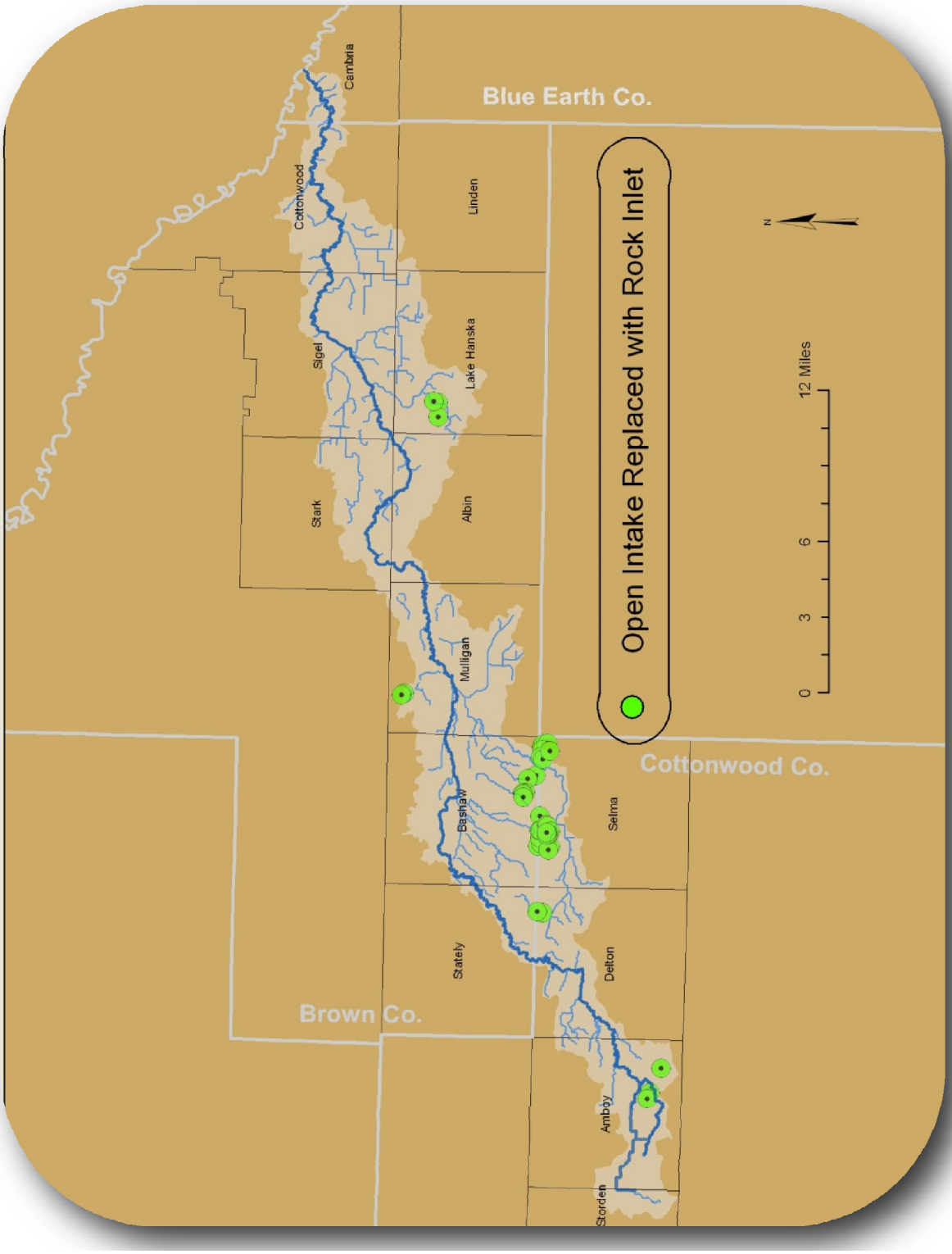
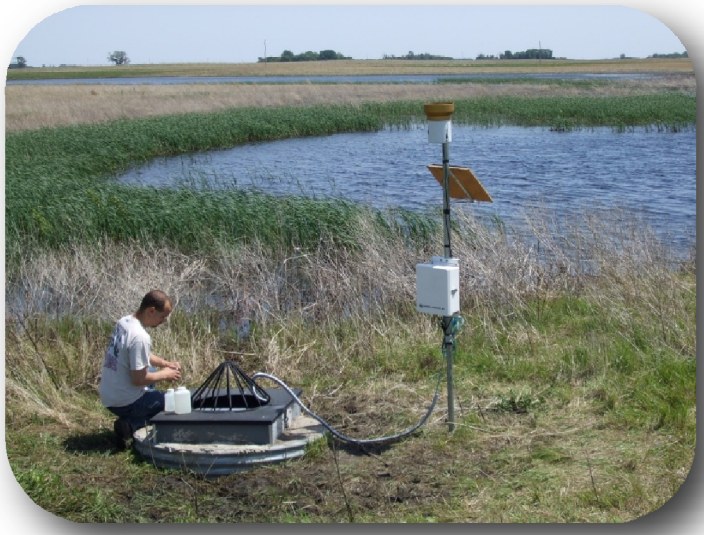


FIGURE 3-9-ILLUSTRATION OF PROJECT SPONSORED OPEN TILE INTAKE REPLACEMENTS

Wetland Restoration Treatment Effectiveness Monitoring



Kevin Weber, a Stately Township landowner, enrolled a portion of his farm into the Conservation Reserve Enhancement Program in 2002. Kevin's site represented one of fifty-two easements that were enrolled in the Little Cottonwood Watershed. What was unique about Kevin's site was that it was one of the largest prairie and wetland restoration sites in the Middle Minnesota Major Watershed. The 158-acre site was located within just a few hundred yards of the Little Cottonwood and proved to be a great location for helping reduce downstream flooding, and improve water quality and wildlife habitat. What was also unique about this site was that a large 18" diameter public drainage tile main (CD54b) ran directly through the property. The tile main presented an opportunity to treat up to 500 acres of upland cultivated land within the LCR watershed.

In 2005, the Brown SWCD and Board of Soil and Water Resources proposed a plan to the Brown County Drainage Authority that would entail outletting the CD58b tile main to the surface and into a series of restored wetlands on the south end of the property. The drainage water would then be slowly released back into a tile through an adjustable control structure on the north end of the property. When initially proposed, a few neighboring landowners had reservations about the project citing concerns with the manipulation of the CD54b tile and possible impact on their drainage system. The Drainage Authority voted to approve the project stating the project would maximize flood control and water quality improvements for the LCR and Minnesota River. In late 2005 construction began and the project was restored by 2006.

In early 2007, the LCR watershed project also viewed the project as unique in that it would provide the opportunity to monitor the benefits associated with the project and address any concerns that the adjacent landowners may still have. In May of 2007, flow monitoring equipment was installed at both the tile inflow and wetland outflow to quantify any benefits associated with flood control, drainage performance and water quality improvements.

Results

The 2007 monitoring season for the Weber Wetland ran from May 17th to October 3rd. Two sites were installed; one at the wetland's outlet and one at the 18" diameter county tile main that was manipulated to flow above ground and into the restored wetland. Unfortunately, the flow monitoring equipment was installed later in the season and removed from the site on October 3rd. It is important to note that most of the runoff in 2007 occurred in March, April, June and October; therefore the results are limited and only represent a small portion of the 2007 growing season flow events. The outlet was dry from June 28th through the end of the monitoring season, but then resumed in Mid-October following heavy rainfall.

When the wetland's total inflow and outflow was calculated, there was about 9.4 million gallons entering the wetland via the CD54b tile and only about 3.7 million gallons draining out of the restored wetland. (These calculations also include the contribution from direct rainfall inputs to the 20-acre wetland pool.) This resulted in a difference of 5.7 million gallons. It can be assumed that the difference between inflow and outflow can be attributed to groundwater infiltration, direct evaporation, and evapo-transpiration from the vegetation in and around the wetland. Although the monitoring period is quite limited the monitoring did show that the wetland provided approximately 17.5 acre-feet of water storage, and demonstrated important flood reduction qualities. Additional monitoring in 2008 will help better quantify the flood reduction qualities of the wetland. Upland landowner claims regarding a possible impedance of their drainage tile from the wetland or freezing of the CD54b tile outlet were unsubstantiated.

Water quality monitoring was typically conducted once every two weeks throughout the growing season, though no samples were taken after July 5th as the system was dry for most of the remainder of the season. Samples were taken to Minnesota Valley Testing Labs in New Ulm for analysis. Unfortunately, as the equipment was removed from site on October 3rd, the heavy rainfall for that month was not recorded and no samples were taken.

The wetland was found to be very effective at removing nitrates from the incoming sub-surface drainage tile water. Approximately 500 pounds of nitrates entered the system during the monitoring season, while only 41 pounds left the system,

yielding a 92% reduction in nitrates. The anaerobic conditions found in the wetland provide very efficient and optimal conditions for natural de-nitrification processes. Since the monitoring season was very limited (May 17-July 5th) and represents only about one fourth of a typical monitoring season the net nitrogen yield reductions are underestimated. More monitoring will be needed to develop a yearly average net nitrogen load reduction, but it is estimated that least 3,000 pounds of nitrogen/year will be removed by the wetland every year from March through October. As nitrate levels continue to rise in the watershed (Chapter 5), nitrate reducing wetlands like this one will play a very important role in helping offset nitrate contributions from sub-surface drainage tile systems and possible impacts on local groundwater and surface water resources.

There was, however, a net increase in total phosphates during the season. Approximately 2 pounds of total phosphorus entered the wetland, but 4.35 pounds was measured from the outflow. This resulted in a 117% increase. Higher phosphorus concentrations are quite typical with newly restored wetlands as much of the soil bound phosphorus is released during anaerobic conditions found in the wetland. It is expected that these concentrations will eventually go down as the conditions the reduction/oxidation processes in the wetland stabilize over time.

Effectiveness monitoring of this CREP wetland/prairie restoration is planned to continue beyond the Clean Water Partnership. These efforts are intended to provide follow-up education for local watershed landowners, residents and policy makers.

Dairy Milk House Wastewater Treatment System

Most of the small dairy farms that once scattered across the Middle Minnesota Watershed have been lost over the past several decades. However, the Little Cottonwood River Watershed still retains many small dairy's and provide a substantial contribution to local economies. In some cases, the animal wastes associated with these facilities can present an environmental impact to the river.

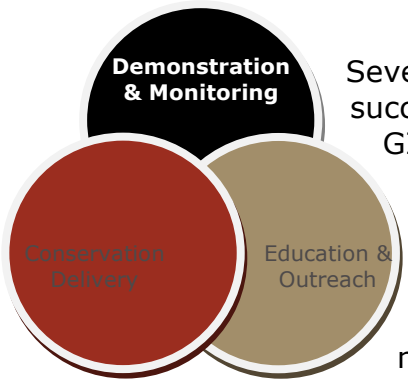
In 2003, the Watershed Project assisted Steve and Kerry Hoffman. The Hoffman's have a 70-herd Holstein dairy and the feedlot is located next to ravine which flows directly to the LCR. Managing an open feedlot next to this steep ravine was creating a challenge for the Hoffman's as they considered expanding their dairy. Through a collaborative effort the local and area Natural Resources Conservation Service and Soil and Water Conservation District offices, , the Hoffman's were able to install a state-of-the-art wastewater treatment system (flocculation) to treat milk house wastes before they are discharged into the ravine and nearby LCR river.

The flocculation system is a simple two-step process. First, wastewater is pumped into a tank, where a flocculent is added to concentrate the wastes into a sludge that can be separated from the liquids. Then, the sludge is disposed of with the manure or used as a soil amendment. Second, the liquid portion is sent to an underground infiltration field, much like a septic system, for final treatment. Figure 4-1 summarizes several tests which were conducted at the site during the first year of operation. Water quality tests before and after the project showed that 87-95 percent of phosphorus and sediments were removed from the waste stream and the pH was neutralized. This innovative system will be a valuable demonstration tool for other dairy farmers and Ag education agents in the region.

Total cost of the project was $20,000 of which 25% of the Cost-share funding was provided by the watershed project ($5,000) and 50% was provided by the Environmental Quality Incentive Program ($10,000). Technical assistance was provided by the Brown NRCS, and SWCD.

Parameter	Before	After	% Removal
BOD	1191 mg/L	213 mg/L	82%
Solids	390 mg/L	17 mg/L	96%
Phosphorus	52 mg/L	1 mg/L	98%

FIGURE 4-1-TREATMENT EFFECTIVENESS OF DAIRY MILK HOUSE WASTEWATER USING A FLOCCULATION AND INFILTRATION FIELD



Several methods were used to evaluate the effectiveness and success of the watershed project. Some of those methods included GIS mapping of project related conservation practices, interviews with landowners, in-stream fisheries assessments conducted by the Minnesota Department of Natural Resources and transparency tube surveys. Perhaps, the most important method that has been utilized is the continued use and implementation of long term water quality and quantity monitoring.

Since 1996, monitoring has been used to track changes in temporal and spatial water quality patterns as well as evaluate the effectiveness of watershed protection efforts. The information that is presented below reflects data from the mouth of the Little Cottonwood Watershed (Site LCR4). The data is based on grab samples collected near the USGS gaging station south of Courtland. Water samples were analyzed for total suspended solids, total and ortho-phosphorus, nitrate-nitrogen and E.coli bacteria. Several in field tests were also conducted including dissolved oxygen, transparency, conductivity, and pH.

Grab sample concentrations are presented along with calculations representing flow weighted mean concentrations (FWMC) and pollutant loads. The sample grab concentrations reflect data from 1996 through May 2008. The FWMC and pollutant loads reflect data from 1998-2007. Samples are collected throughout the growing season or from March 15 through October 15. An average total of 21 samples collected over various hydrologic flow regimes were utilized to calculate loads and FWMC. Three additional water quality monitoring sites, (LCR1, LCR2, LCR3) were assessed from 1997-2000, but were discontinued in 2001 due to budget constraints. Data from those sites can be found in the LCR Phase I Diagnostic Study report completed in 2001 and in figure 5-10.

Several water quality studies conducted throughout the Minnesota River Basin have shown excessive nutrient and sediment concentrations. Large portions of the basin do not meet state water quality standards for bacteria, turbidity, dissolved oxygen, ammonia, and biota. In these studies, researchers have analyzed almost thirty years worth of water quality data from the Minnesota River at Jordan and Fort Snelling. Trend analyses indicate increasing nitrate-N concentrations in the last ten years. Conversely, researchers have observed general decreasing trends in total suspended solids and total phosphorus levels over the entire monitoring record.

Since 1997, similar trends have been observed for the Little Cottonwood River Watershed and are presented below. It is important to note that this is a basic trend analysis to determine relative differences since the beginning of the project. It is hoped that through continued funding, additional long-term monitoring and continued maintenance and implementation of conservation practices that positive water quality improvements can be observed at the watershed scale. In the future a more robust investigation of watershed scale effectiveness monitoring should be conducted.

Hydrologic/Climatic Conditions

Figure 5-1 represents the flow hydrograph of the LCR from 1997-2007. Flow data up until June 30, 2008 is also included. Since 1971, the USGS has operated and maintained the long-term flow record at the mouth of the watershed. For several years the Minnesota Department of Natural Resources-Division of Waters has provided half of the funds needed to maintain this site. However, due to state funding cuts in 2003, the DNR funding arrangement was canceled. Unable to provide the remaining match, the USGS was considering the closure of this station resulting in the loss of a continuous flow record since 1971. Under a special agreement with the USGS and with funds provided by the LCR Phase II watershed project, $8,400/year was allocated to the USGS to keep the site operational. This agreement was instrumental in continuing this long term and very important data set.

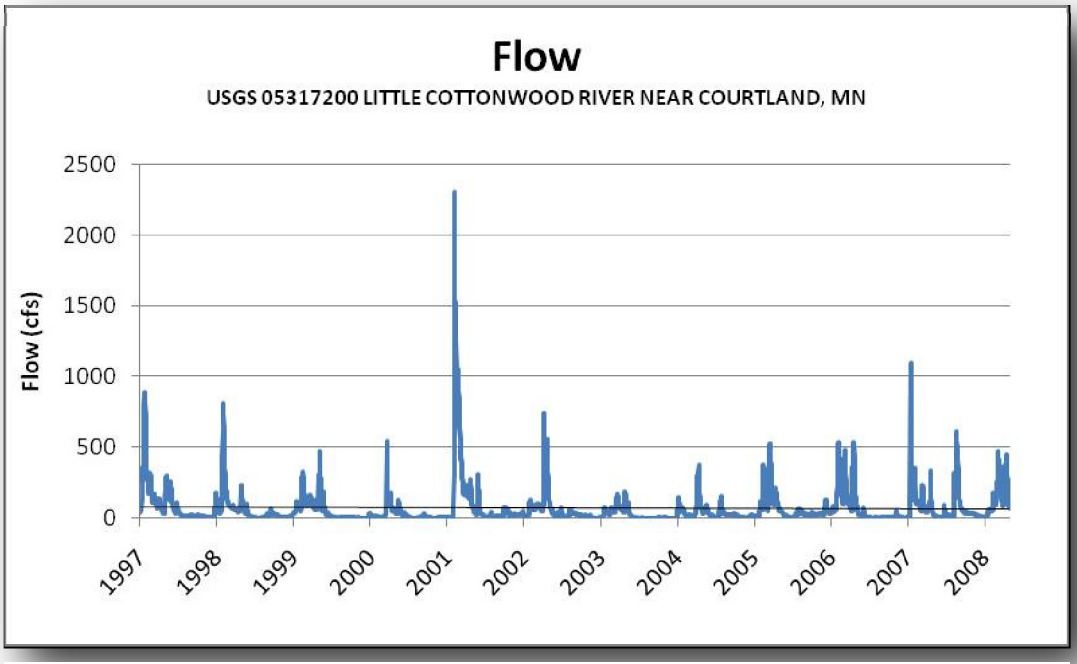


FIGURE 5-1 USGS FLOW HYDROGRAPH 1997-JUNE 2008

Analysis of the general runoff conditions in the watershed must be considered when evaluating possible trends in pollutant loads and flood reductions resulting from watershed conservation efforts. In effort to determine relative deviations from normal, runoff values were compared for each year. Figure 5-2 compares the annual runoff calculated for each year to the 30 year flow record average. The 30-year runoff average or normal for the LCR watershed has been calculated to equal 5.8 inches.

Overall when averaging all eleven years, runoff conditions were found to be 4% below what is considered normal for the watershed. Figure 5-2 indicates that eight of the eleven years were considered below normal. On the contrary, years 2001 and 2007 had watershed runoff values as high as 90% above normal. Despite the similarity of above normal runoff values for both years, the resulting peak flows in 2007 were about 48% less than that of 2001. Could the additional conservation program acres in the watershed be linked to this reduction? Possibly, but there are a variety of other factors that may explain these differences. Antecedent moisture conditions, timing, duration, and intensity of the rainfall events are just some of the major influences that determine overland flow and stream discharge differences. For instance, most of the 2007 growing season was considered below normal. However, in the month of October, the watershed received nearly three times more precipitation compared to normal. The 2001 water year was also above normal in terms of watershed runoff and resulted in similar runoff values, however the peak flows were over two times that observed in 2007. This spring runoff conditions in 2001 can explain these differences.

The 2000/2001 winter season brought significant snowfall to many Minnesota counties. Seasonal snowfall totals exceeding 60 inches were common throughout western and southern Minnesota. Snowfall totals ranked above the 80th percentile across much of south central Minnesota. In some communities, seasonal snowfall exceeded the 95th percentile. A combination of record breaking rainfall in April, high amounts of antecedent moisture conditions from the previous fall and the extensive amount of snowpack and melting snow over frozen soils resulted in the very high flow conditions in 2001. The high pollutant loads and flow weighted mean concentrations are reflective of these hydrologic conditions during 2001.

Long term continued monitoring and hydrologic analysis will be needed to determine if any peak flow reductions trends at the watershed scale are resulting from land use changes implemented during the Clean Water Partnership.

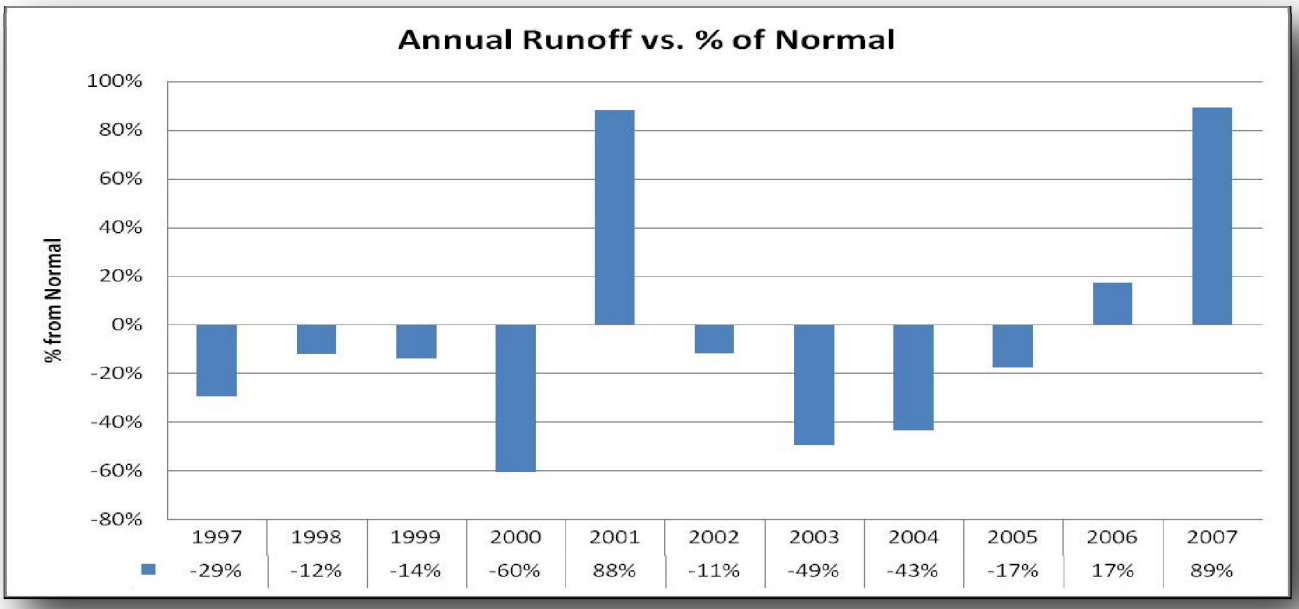
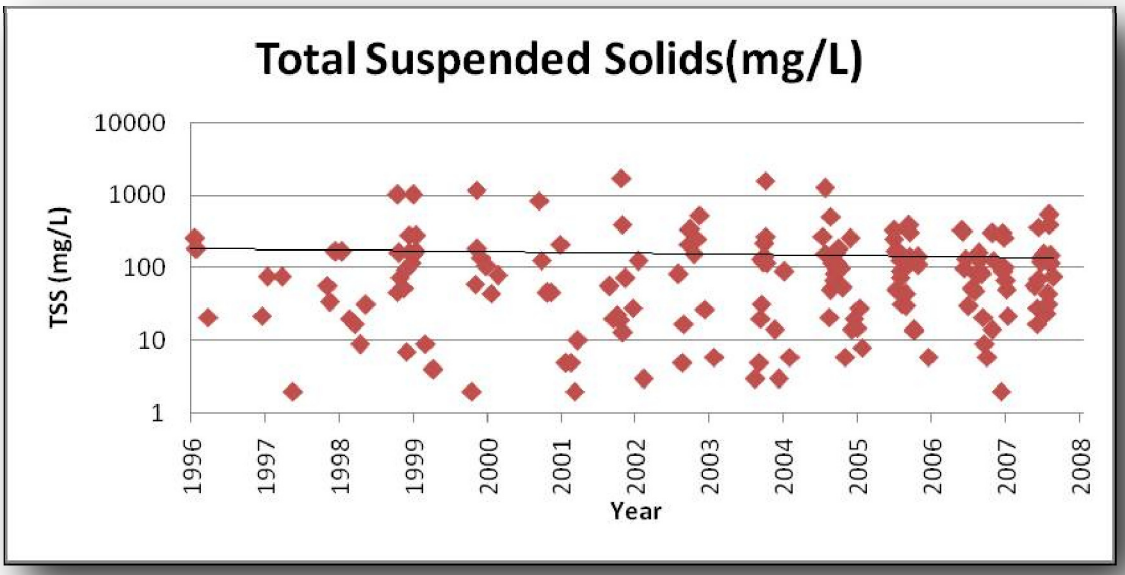


FIGURE 5-2- LCR ANNUAL RUNOFF COMPARED TO PERCENT DEVIATION FROM NORMAL

The winter of 2000/2001 was characterized by very high stream flows, flooding and snowmelt runoff. Heavy winter snowfall combined with significant autumn moisture and record April rainfall were major factors leading to these flooding conditions. The picture at left (taken April 5, 2001) represents some of the flooding near the lower portion of the watershed.

Sediment



Count	Mean	Median	Max	25%	50%	75%	%>limit
178	155	91	1719	23	91	162	68

FIGURE 5-3- TOTAL SUSPENDED SOLID CONCENTRATIONS FROM 1996-JUNE 2008

Figure 5-3 represents 172 total suspended solid concentrations (TSS) that have been collected since 1996 through June 30, 2008. Using a turbidity equivalent of 43 mg/L for TSS (figure 5-4), 68% of the samples collected had concentrations above state and federal water quality standards.

Beginning in 2006, turbidity samples were collected in addition to TSS. Since the state standard for water clarity (25 NTU) is based on turbidity a correlation was developed. Figure 5-4 represents the correlation between these two parameters. In the LCR watershed, 43 mg/L TSS = 25 NTU turbidity.

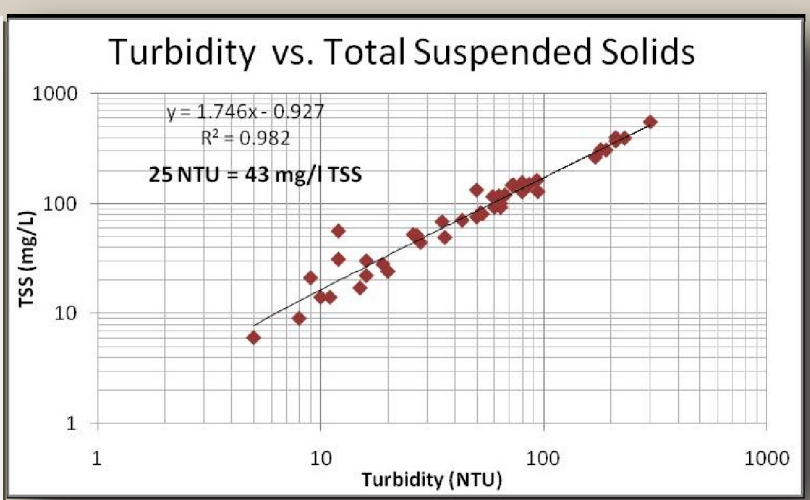


FIGURE 5-4-LCR TURBIDITY AND TSS CORRELATION

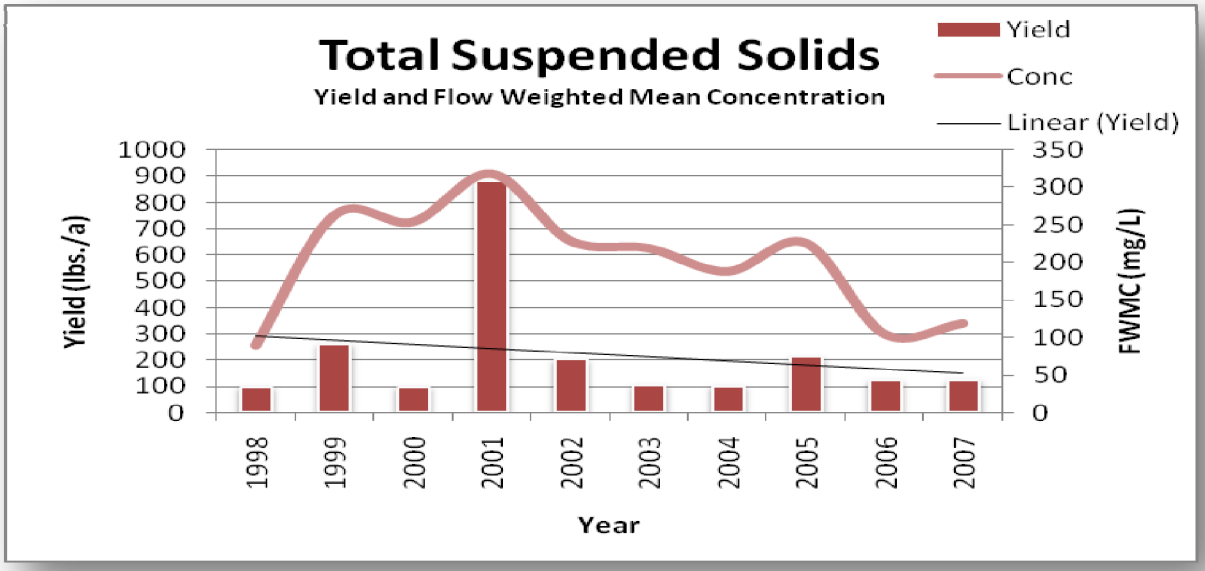


FIGURE 5-5-TSS YIELD AND FWMC FROM 1998-2007

Figure 5-5 depicts total sediment pollutant load and flow weighted mean concentration trends for the watershed from 1998-2007. On average, a total of 12,000 tons or 222 lbs./acre of sediment was delivered to the Minnesota from the Little Cottonwood River per year. This resulted in an average concentration of 201 mg/l. Using a standard of 44 mg/L for total suspended solids this concentration is nearly five times over the state water quality standard set for this water resource. Despite these concentrations the figure does indicate a slight decreasing trend for sediment load delivery to the Minnesota River.

Transparency Tube Assessments

Transparency Tube

In June 2008, watershed staff collected transparency tube readings at 43 locations along the entire length of the Little Cottonwood River to determine spatial differences in water clarity. The survey was conducted June 26th and June 27th, using a standard 60 cm transparency tube. A total of 43 bridge / highway crossing were surveyed, starting at the Minnesota State Highway 68 Bridge in Blue Earth County and ending at the Minnesota State Highway 30 crossing in Cottonwood County. No substantial rainfall was recorded in the watershed in the two weeks prior to the survey, eliminating runoff as a possible method of sediment delivery.

The Little Cottonwood River is listed as impaired for turbidity by the MPCA and must reach a seasonal standard of 25 NTUs (a measure of turbidity) or less to be delisted. Based on long-term data gathered from the monitoring site at the mouth of the Little Cottonwood (LCR 4), it is possible to develop a relationship between Turbidity and Transparency. Figure 5-6 depicts this inverse relationship. Therefore, the corresponding transparency equivalent for a turbidity standard of 25 NTUs is ~31 cm.

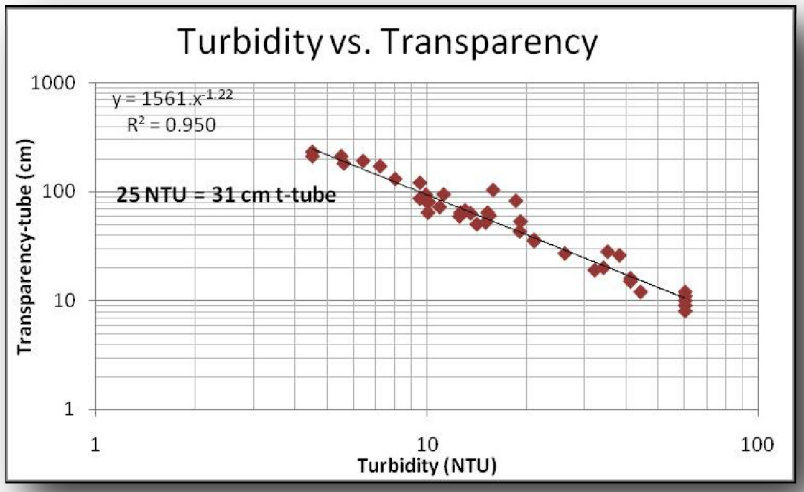


FIGURE 5-6- LCR TURBIDITY AND TRANSPARENCY CORRELATION

Results

Figure 5-7 illustrates turbidity levels at the 43 testing locations. In the lower section of the watershed (ravine-dominated terrain) turbidity levels were low, 42 NTU turbidity (16 cm transp.), but showed slight signs of improvement with distance upstream. However, the lowest transparencies were recorded in the relatively flat middle section of the watershed. In this section, transparencies were typically in the 46 NTU (14 cm) range, but would frequently increase to 56 NTU (11 cm) for several miles before improving in the upper portion of the watershed.

The most substantial drop in transparencies is in the transition zone between the upper and middle sections of the watershed, increasing from 19 NTU (44 cm) to 30 NTU (24 cm) over a distance of 2 miles. Upstream of this location, transparencies steadily improve until reaching 15 NTU or less (>60 cm) by the Brown/Cottonwood County line. All sites surveyed in Cottonwood County had turbidity levels of 15 NTU or less. Overall this assessment illustrates that water clarity during non-runoff

conditions appeared to be the lowest in the middle and lower sections of the watershed (Mulligan, Albin, and Sigel Townships). A vast majority of the sites surveyed, which had readings from 38-60 NTUs (10 to 18 cm) are in excess of the 25 NTU standard. Despite the high levels of CREP and CRP adoption within this area (Chapter 3), it would seem counterintuitive that water clarity would be lower within the middle portion of the watershed.
Possible explanations:

- The middle portion of the watershed has different stream channel morphology compared to the upper and lower reaches. The middle portion is mainly level with broad open channels and floodplain. Average gradients in the middle portion of the watershed average 5 feet/mile compared to 20 feet/mile in the upper portions of the watershed. It is theorized that much of the sediment that is derived from the upper reaches of the watershed settles out in this flat-middle portion of the watershed. This 'legacy' sediment is then re-suspended during storm events and through livestock land use activities during non-storm event conditions.
- The middle portion of the watershed tends to have more open feedlots and direct livestock access to the River channel. Diagnostic study field assessments (TISWA and fish shocking surveys) conducted in 1999 and 2000 indicated several locations where cattle had free access to the River. In the summer months, livestock tend to congregate in the channel to stay cool. It is speculated that the constant activity of the livestock in the water re-suspends some of the legacy sediment deposited in the river channel, thus increasing overall turbidity levels and decreasing water clarity. Watershed staff worked with several producers during the implementation phase to encourage stream fencing, livestock exclusion, remote watering and stream crossing practices. There was very little interest in the programs even when 90% cost-share was offered. The project did have one producer eventually fence his cattle away from the river. The producer did use technical assistance but did not utilize project funds.

Due to the relative low costs, additional runoff/non-runoff transparency tube assessments are planned in the future to continue to evaluate these initial findings.

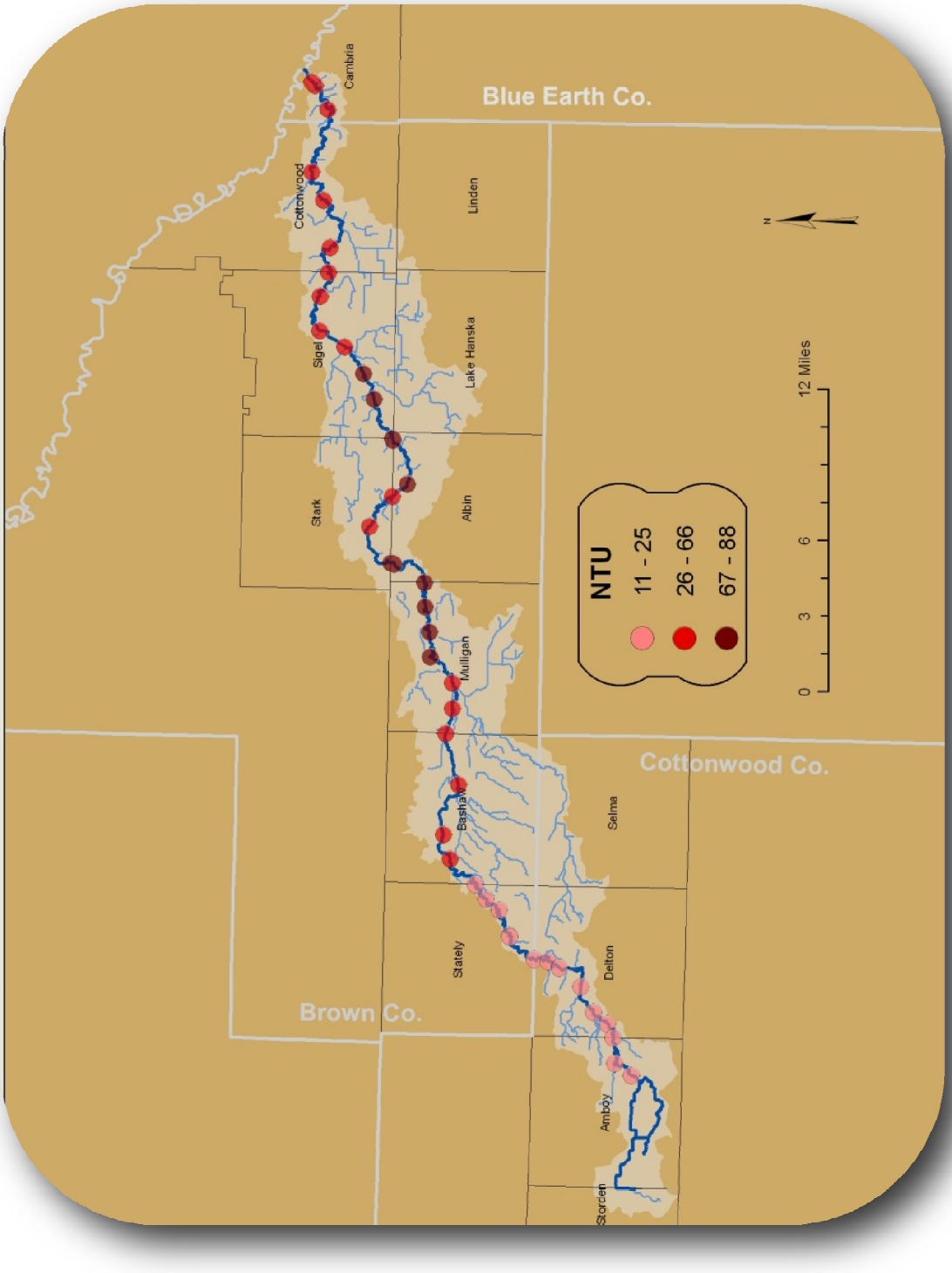
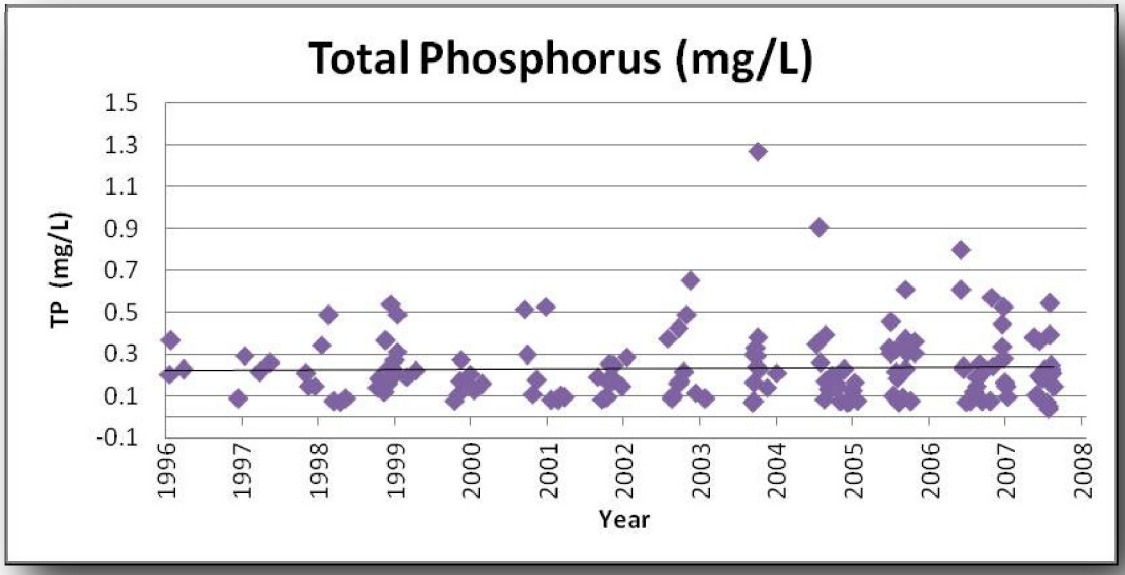


FIGURE 5-7-ILLUSTRATION OF LCR TURBIDITY LEVELS AT VARIOUS LOCATIONS

Phosphorus



Count	Mean	Median	Max	25%	50%	75%	%>limit
178	0.220	.190	1.27	.010	.190	.290	28

FIGURE 5-8- TOTAL PHOSPHORUS CONCENTRATIONS FROM 1996-JUNE 2008

Figure 5-8 represents 178 total phosphorus samples that have been collected since 1996 through June 30, 2008. Using a standard of .260 mg/L, 28% of the samples collected were above this level. Currently a phosphorus standard does not exist for the watershed, however, studies have shown that algae growth and subsequent low dissolved oxygen levels cannot be controlled if concentrations exceed .260 mg/l. Ortho-phosphorus tests were also conducted. It was found that during the time period of 1996-2008, 45% of the total phosphorus was in the dissolved reactive form (ortho-phosphorus).

Phosphorus

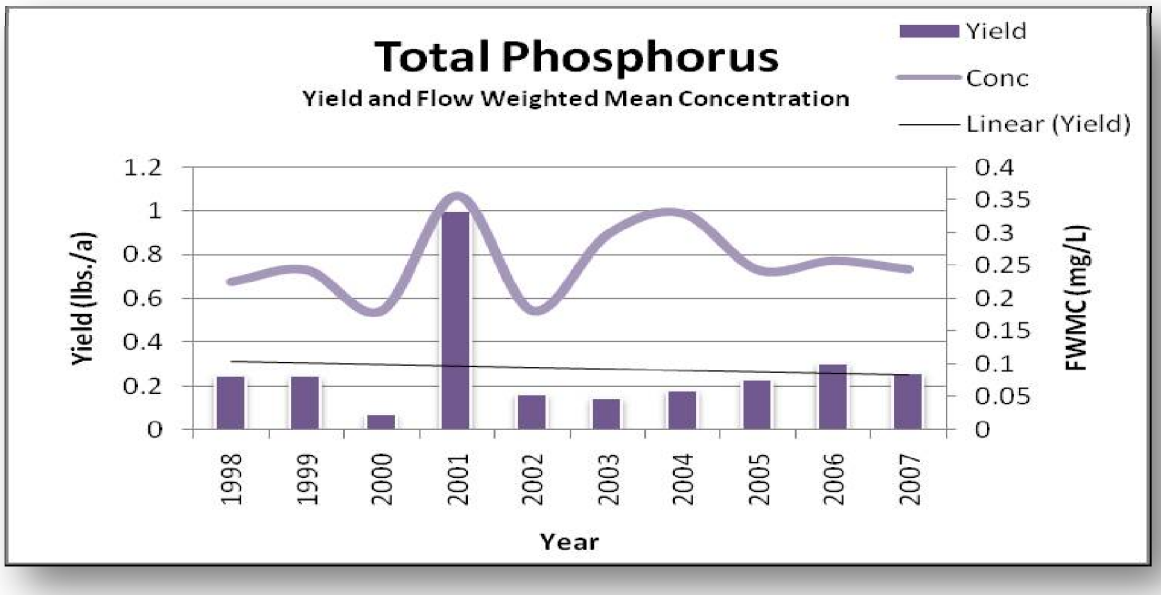
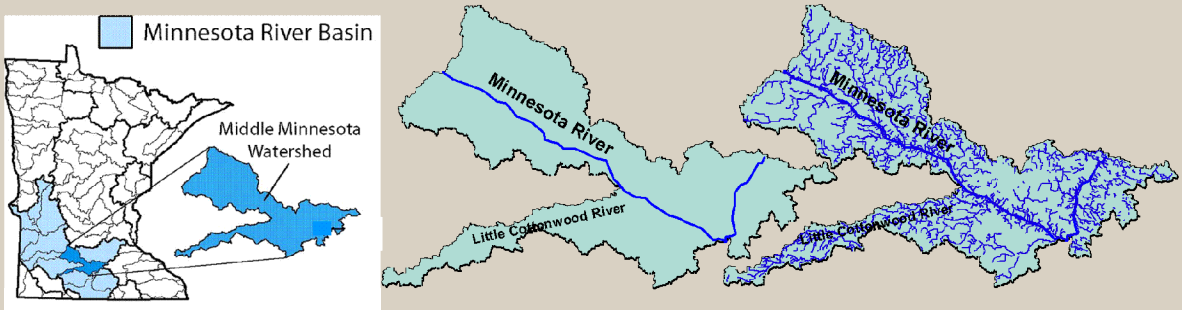


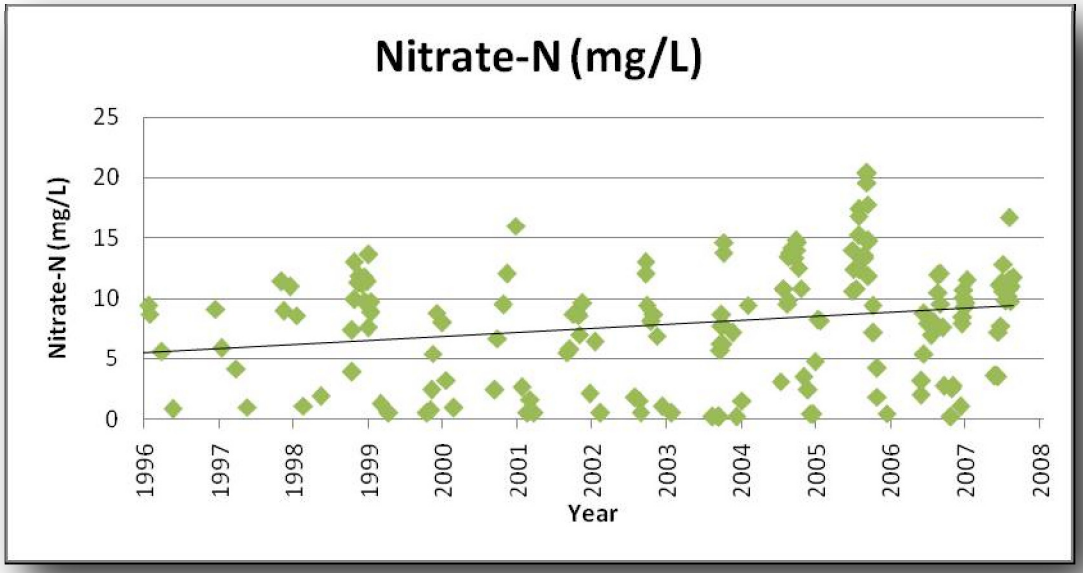
FIGURE 5-9- TOTAL PHOSPHORUS YIELD AND FWMC FROM 1998-2007

Figure 5-9 represents the total phosphorus and FWMC. On average, a total of 15.4 tons or .283 lbs./acre of phosphorus was delivered to the Minnesota from the Little Cottonwood River per growing season. This resulted in an average concentration of 0.257 mg/l. Using a standard of .260 mg/L this concentration is slightly under the proposed standard for this water resource. In comparison to total phosphorus concentrations found in the Minnesota River near Jordan, the Little Cottonwood River total phosphorus values average about 24% less.

The Minnesota River Basin is comprised of 12 major watersheds. Unlike the other Major Watersheds (such as the Blue Earth, and the Le Sueur watersheds), the Middle Minnesota does not have a main identifying tributary. Instead, it is defined by hundreds of first and second order streams which flow directly to the Minnesota River. Due to this characteristic, it is difficult to quantify the proportion of pollutants that are derived specifically from the Middle Minnesota. Consequently, the water quality and quantity data derived from the Little Cottonwood Watershed Project provides essential information for determining the relative contribution of these small tributaries to the Minnesota River.



Nitrate-Nitrogen



Count	Mean	Median	Max	25%	50%	75%	%>limit
176	8	9	20	4	9	11	35

FIGURE 5-10-NITRATE-NITROGEN CONCENTRATIONS FROM 1996-JUNE 2008

Figure 5-10 represents 176 No3-N samples that have been collected since 1996 through June 30, 2008. Using a drinking water standard of 10 mg/L, 35% of the samples exceeded this standard. Currently a nitrate surface water standard does not exist for the watershed. Unlike sediment and phosphorus grab sample concentrations, nitrate concentrations have shown a strong increasing trend. This trend is consistent with data derived from the Seven Mile Creek Watershed Project and other monitoring conducted in the Minnesota River Basin.

Nitrate-Nitrogen

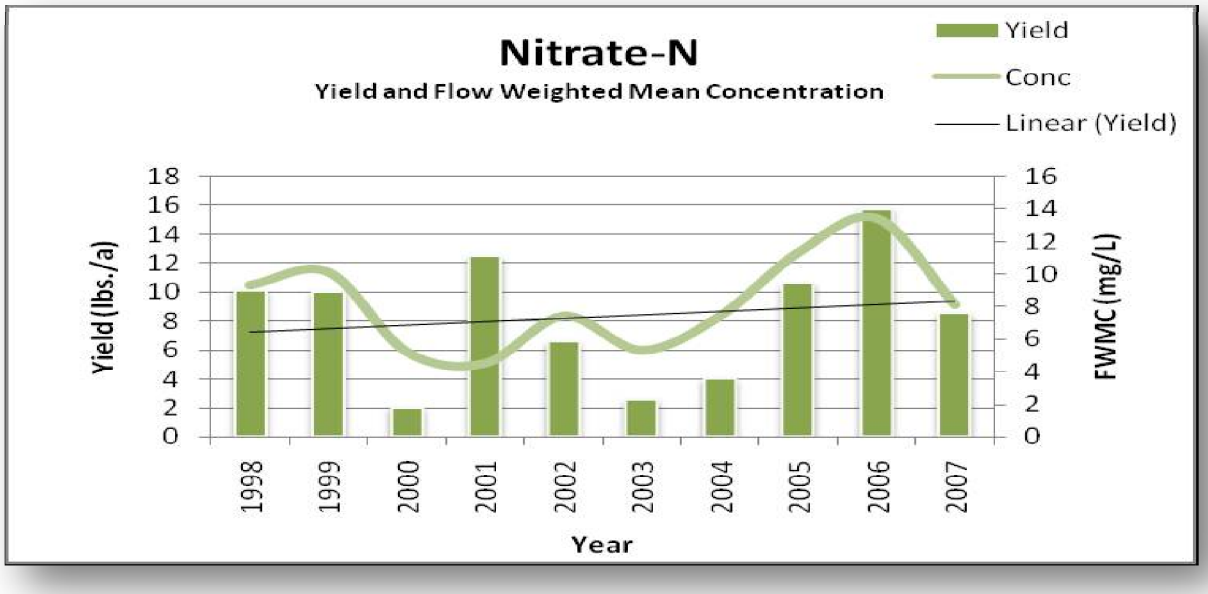
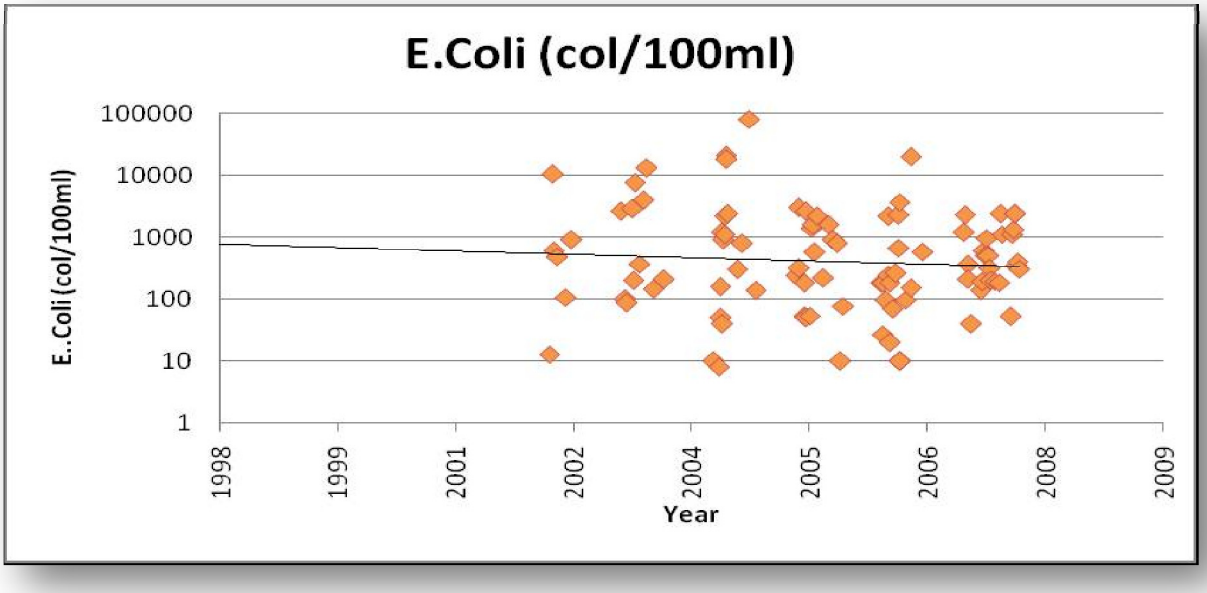


FIGURE 5-10- NITRATE NITROGEN YIELD AND FWMC FROM 1998-2007

Figure 5-10 represents the average loading rates and flow weighted concentration trends for the watershed. On average, a total of 451 tons or 8.3 lbs./acre of nitrogen was delivered to the Minnesota from the Little Cottonwood River per year. This resulted in a flow weighted mean concentration of 8.2 mg/l. Using a standard of 10 mg/L this concentration is under the proposed state water quality standard proposed for this water resource. Unlike the trends found for sediment and phosphorus, nitrate levels appear to be on the rise and show a strong increasing trend. If this trend continues it is expected that the flow weighted concentration for nitrate will exceed 10 mg/l by 2010. This trend is very similar to other watershed data throughout the Minnesota River Basin. Possible increases in this trend include: increase in the amount of sub-surface drainage tile, increases in corn on corn acreage and an overall increasing trend of yearly precipitation.

Bacteria



Count	Mean	Median	Max	Geomean	%>limit
111	2238	326	80000	365	77

FIGURE 5-11-E.COLI CONCENTRATION FROM 2002-JUNE 2008

Figure 5-11 represents 111 E.coli samples that have been collected since 2002. Using a standard of 126 col./100ml, 77% of the samples exceeded this standard. The geometric mean was found to be 365 col./100 ml. This is over three times the water quality standard for this water resource. The trend over the past seven years indicates a slight decreasing trend. The upgrade of small un-sewered communities like the town of Searles in 2000, upgrade of 37 individual septic systems, more conservation buffers and better management of livestock and manure sources could help explain this positive trend.

Figure 5-12 summarizes all of the FWMC values for the three monitoring stations in the watershed. Please note that both site 2 and site 3 were discontinued by 2002 due to limited project funds.

Site/Year	TSS mg/L	NO_3-N mg/L	Total P mg/L	Ortho P mg/L
Site 2 (1998-2002)	88.5	12.4	0.162	0.048
Site 3 (1998-1999)	123.4	8.7	0.280	0.082
Site 4 (1998-2007)	201	8.2	0.257	0.112

FIGURE 5-12-SUMMARY OF FWMC BY SITE AND PARAMETER

Did the watershed project help improve water quality?

As simple as that question might be, it tends to be a very difficult one to answer. Annual changes in land use practices, climate, rainfall distribution and other natural processes create a very dynamic and complicated system. Long term data over many different years combined with computer model simulations are necessary to help formulate any possible water quality trends associated with land use practice changes at the watershed scale. In addition, simple tests like the transparency tube assessment will need to be continued. Listed below is a very basic attempt to address that question. Please note that a more rigorous analysis including watershed computer model simulations should be completed to help answer these questions.

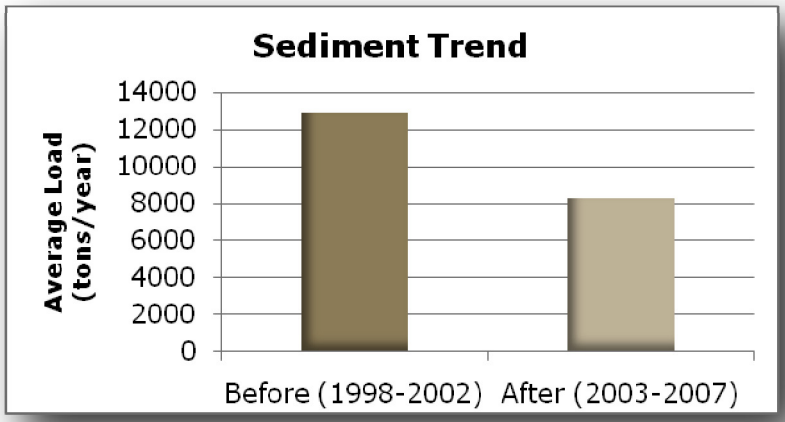


FIGURE 5-13- COMPARISON OF SEDIMENT LOADS PRE WATERSHED PROJECT TO POST TREATMENT

An analysis of the sediment and nutrient loads (1998-2007) was conducted to determine if any reductions could be associated with the increased adoption of conservation by watershed landowners. The pollutant loads were separated into a '*before*' period (1998-2004) and an '*after*' period (2005-2007). The period after 2004 was selected since it was felt that all CREP and CCRP acres that were associated with the watershed project were installed after that point. When comparing the average loads from these two time periods, sediment and phosphorus loads appear to show a decrease of thirty-five percent (-35%) and eight- percent (-8%) respectively.

2001 outlier

One could assume that the perceived reductions in sediment and nutrient loads over the life of the project would not be as pronounced if the extreme loads resulting from the spring floods of 2001 were not utilized in the averaging of pollutant loads during the 'before' time period. When comparing the

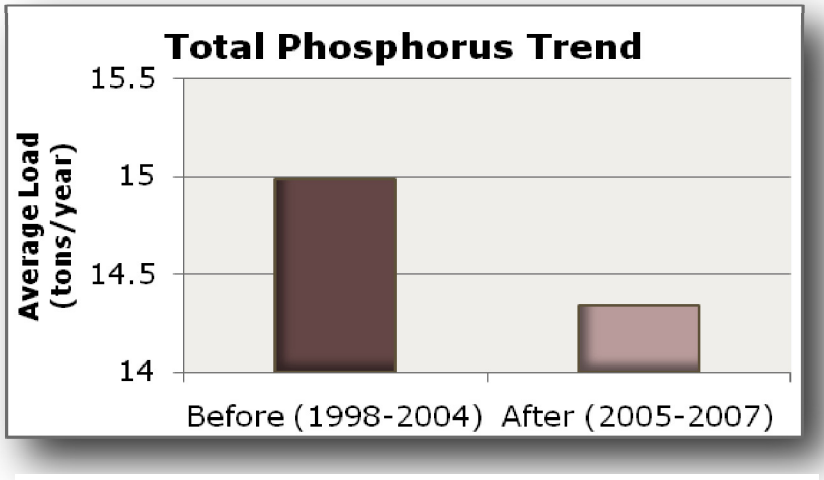


FIGURE 5-14- COMPARISON OF PHOSPHORUS LOADS PRE WATERSHED PROJECT TO POST TREATMENT

before and after time periods *and* when the 2001 loads are not included in the analysis, the perceived trend appears to show a decrease of sediment by eleven percent (-11%), but an increase in phosphorus by twenty-three percent (+23%). Since phosphorus is typically bound to sediment it is unclear why there appears to be an inverse relationship. One would assume that if sediment is decreasing the same would apply to phosphorus. One possible explanation could be derived from the release of legacy sources of dissolved phosphorus. Further studies are warranted to help answer some of those questions.

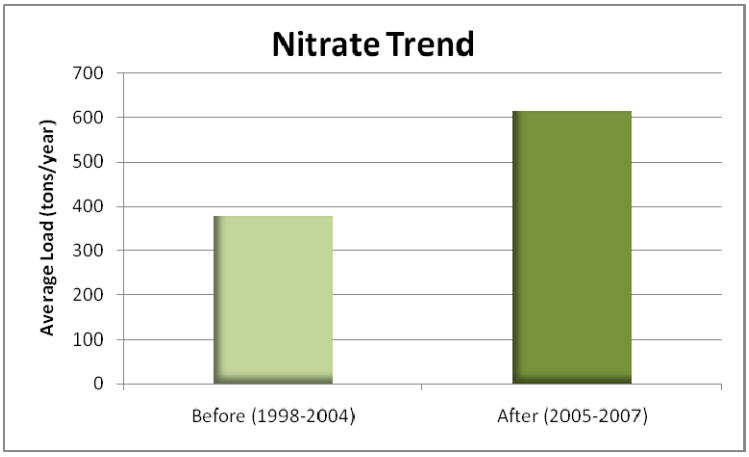
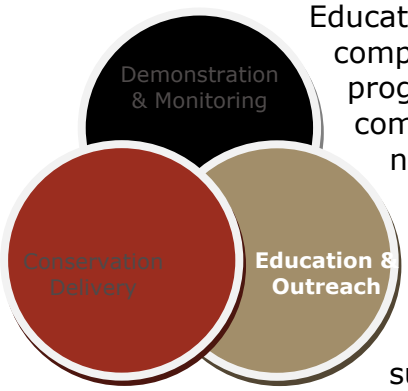


FIGURE 5-15- COMPARISON OF NITRATE LOADS PRE WATERSHED PROJECT TO POST TREATMENT

When the same analysis was conducted for nitrate loading, a strong increase is observed. Average nitrate loads appeared to increase by sixty-three percent (+63%). When the extreme flooding event of 2001 is not used the nitrate loads appear to increase an additional six percent (+6%). General increasing trends in annual precipitation combined with more corn/corn rotation acres and more sub-surface drainage could explain this increase.

In summary, it appears that there are some positive indications that sediment loads are decreasing. However, it does appear that nutrient loads are increasing, especially nitrate. It should be emphasized that these conclusions are limited with respect to post treatment load data. Therefore, continued long term monitoring, analysis, and watershed computer model simulations will be imperative to validate any of these perceived trend observations.



Education and outreach was another key component to the project work plan. This program element was important in communicating the availability of numerous conservation programs to landowners and conveying technical water quality data to watershed residents and project partners.

Some watershed projects have found success educating and reaching out to watershed residents through routine public meetings. We, however, did not find much success with that approach. Geography and scale appeared to be the biggest limiting factor for outreach initiatives. The watershed is very long and narrow, and found this characteristic an obstacle for getting residents from the far upper reaches or lower reaches to attend public meetings. It was difficult to maintain a presence and identity through the entire watershed because there were major differences in watershed farming practices, farm size, and cultural attitudes from one end to the other. For instance, the upper watershed tends to have lighter soils which lends to more conservation tillage, while the middle portion of the watershed has heavier clay loam soils which results in less adoption of conservation tillage. Due to some of these challenges, other approaches were used to educate watershed residents and watershed stakeholders.

Periodic newsletters, direct mailings, personal contacts, and on-farm demonstrations were the primary mechanisms used for the education and outreach initiatives. The CREP and CRP projects are good examples of this outreach approach. For instance, during the promotion phase of the project individually tailored outreach materials were sent directly to the landowner. The letter was then followed up by a phone call and on-farm visit. About 600 of these letters were sent to landowners that were eligible for these programs. At the end of the project every landowner and operator was aware of our project and the programs available to them.

Another approach to help educate landowners was through the use of testimonials by other landowners. Numerous articles were written which highlighted what other landowners had to say about the importance of watershed management, water quality, conservation and programs.

To help maintain communication with project partners, small routine meetings were held. The meetings were kept small, less than eight people to ensure everyone felt comfortable sharing their thoughts or ideas. A special CREP and CRP work group was also developed. The group consisted of the NRCS, BWSR, SWCD and FSA offices. The group would meet bi-annually to discuss program updates and track

the progress of program interest by landowners and ways to improve delivery of conservation.

Numerous presentations pertaining to the project were given: A few examples are listed:

- Children's Water Festival
- National Soil and Water Conservation Society Conference, St. Paul, MN
- Minnesota River Joint Powers Board
- American Society of Agricultural Engineers, St. Paul
- Minnesota Environmental Health Association Fall Education Conference Grand Rapids
- Southern MN Progressive Ag Tour
- MN GIS/LIS Conference, St. Cloud, MN
- GBERBI Info. Mtg.
- Watershed Heroes Conference-St. Peter
- MN Public Works Association-Minneapolis
- N-Rate Validation Meeting-Mankato
- Gustavus Adolphus College-Water Resources Class
- MN Rivers and Lakes Conference
- Lake Hanska Conservation Days
- Basin Alliance for the Lower Mississippi, Austin, MN
- State Planning and Zoning Conf.
- Groundwater Guardian Conference

Communication was integral with this program element. Interaction among co-sponsors, partner agencies, supporters, staff and other key stakeholders was found to be crucial for ensuring success. The liaison position/coordinator was very important in helping facilitate proper communication and tried to ensure that people felt involved, respected and appreciated throughout the entire project.

Listed below were some examples and initiatives used to help facilitate the education and outreach program element.

Newsletters

A total of 5 color newsletters were sent to watershed residents and partners during the project. The mailing list included about 900 recipients.


Brown Nicollet Cottonwood Water Quality Board

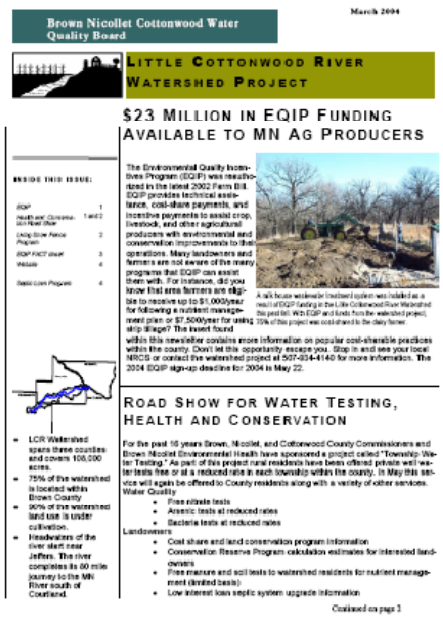
September 2003

LITTLE COTTONWOOD RIVER WATERSHED PROJECT

FUNDS STILL AVAILABLE TO WATERSHED RESIDENTS

USING WETLANDS AS A THIRD CROP TO FARM NITROGEN OUT OF THE SYSTEM

Newsletter 2003


Brown Nicollet Cottonwood Water Quality Board

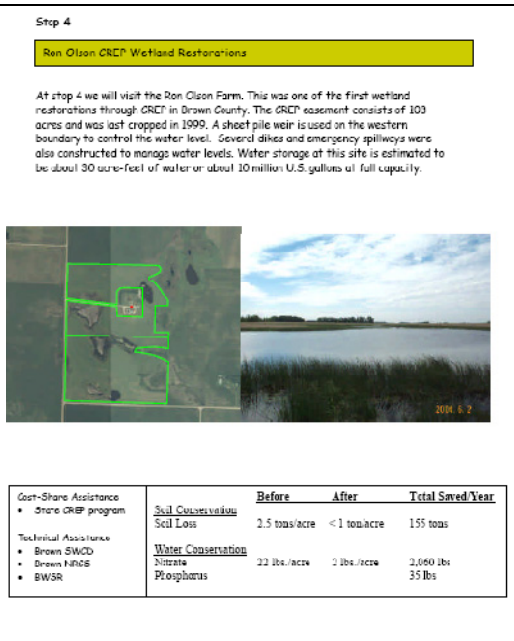
March 2004

LITTLE COTTONWOOD RIVER WATERSHED PROJECT

$23 MILLION IN EQIP FUNDING AVAILABLE TO MN AG PRODUCERS

ROAD SHOW FOR WATER TESTING, HEALTH AND CONSERVATION

Newsletter 2004

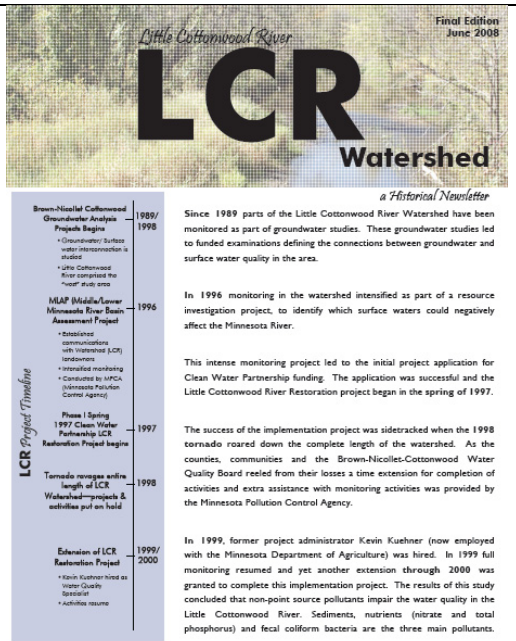

Stop 4

Ron Olson CREP Wetland Restorations

At stop 4 we will visit the Ron Olson Farm. This was one of the first wetland restorations through CREP in Brown County. The CREP easement consists of 103 acres and was last cropped in 1999. A sheet pile weir is used on the western boundary to control the water level. Several dikes and emergency spillways were also constructed to manage water levels. Water storage at this site is estimated to be about 30 acre-feet of water or about 10 million U.S. gallons at full capacity.

Cost-Share Assistance		Before	After	Total Saved/Year
• Share CREP program	Soil Conservation			
Technical Assistance	Soil Loss	2.5 tons/acre	< 1 ton/acre	155 tons
• Brown SWCD	Water Conservation			
• Brown NRCS	Nitrate	22 lbs./acre	2 lbs./acre	2,060 lbs
• BWSR	Phosphorus			35 lbs

Conservation Tour 2004


Little Cottonwood River

LCR Watershed

a Historical Newsletter

Final Edition June 2008

LCR Project Timeline

Brown-Nicollet Cottonwood Groundwater Analysis Projects Begins — 1989/1998

MLAP (Middle/Lower Minnesota River Basin Assessment Project — 1996

Phase I Spring 1997 Clean Water Partnership LCR Restoration Project begins — 1997

Tornado ravages entire length of LCR Watershed—projects & activities put on hold — 1998

Extension of LCR Restoration Project — 1999/2000

Since 1989 parts of the Little Cottonwood River Watershed have been monitored as part of groundwater studies. These groundwater studies led to funded examinations defining the connections between groundwater and surface water quality in the area.

In 1996 monitoring in the watershed intensified as part of a resource investigation project, to identify which surface waters could negatively affect the Minnesota River.

This intense monitoring project led to the initial project application for Clean Water Partnership funding. The application was successful and the Little Cottonwood River Restoration project began in the spring of 1997.

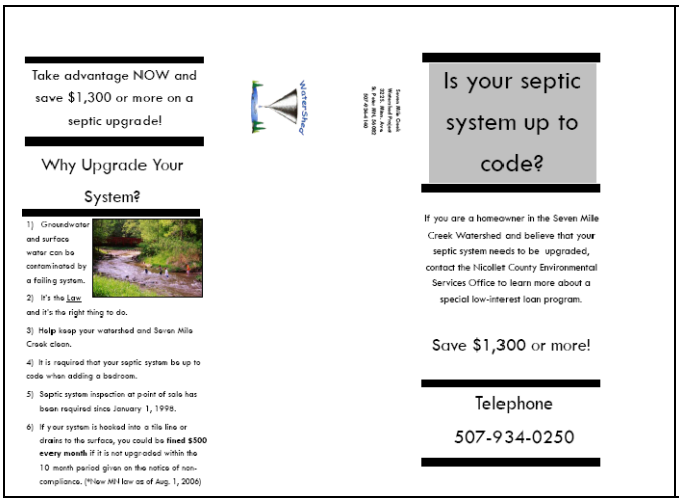
The success of the implementation project was sidetracked when the 1998 tornado roared down the complete length of the watershed. As the counties, communities and the Brown-Nicollet-Cottonwood Water Quality Board reeled from their losses a time extension for completion of activities and extra assistance with monitoring activities was provided by the Minnesota Pollution Control Agency.

In 1999, former project administrator Kevin Kuehner (now employed with the Minnesota Department of Agriculture) was hired. In 1999 full monitoring resumed and yet another extension through 2000 was granted to complete this implementation project. The results of this study concluded that non-point source pollutants impair the water quality in the Little Cottonwood River. Sediments, nutrients (nitrate and total phosphorus) and fecal coliform bacteria are the three main pollutants.

Final Newsletter 2008

Publications

Numerous high quality brochures, publications, mailers and handouts were developed throughout the project. A few examples are provided.


Take advantage NOW and save $1,300 or more on a septic upgrade!

Why Upgrade Your System?

1) Groundwater and surface water can be contaminated by a failing system.

2) It's the Law and it's the right thing to do.

3) Help keep your watershed and Seven Mile Creek clean.

4) It is required that your septic system be up to code when adding a bedroom.

5) Septic system inspection at point of sale has been required since January 1, 1998.

6) If your system is hooked into a tile line or drains to the surface, you could be fined $500 every month if it is not upgraded within the 10 month period given on the notice of non-compliance. (*New MH law as of Aug. 1, 2006)

Is your septic system up to code?

If you are a homeowner in the Seven Mile Creek Watershed and believe that your septic system needs to be upgraded, contact the Nicollet County Environmental Services Office to learn more about a special low-interest loan program.

Save $1,300 or more!

Telephone

507-934-0250

'Is your Septic System up to Code?', 2007


Summary

For More Information

On-Farm Nitrogen Rate Trial Results

South-Central Minnesota Corn following Soybeans 2000-2005

'On-Farm Nitrogen Rate Trial Results', 2006


"I wanted to restore what was once was on my land," states Gary. I felt the CREP program was intended to help restore what was once part of the original landscape. In the case of my land it was prairie."

Leaving a Legacy through Conservation in the Little Cottonwood River Watershed

recently the 100,000 acre goal has been met with over 4,000 of those acres being signed up in Brown County. The initiative was one of the largest efforts to restore habitat and improve water quality in the Minnesota River—one of the nation's most polluted rivers—and its tributaries.

"When I heard about the program I became interested and after learning more I decided to participate in the program," Rathman said. After enrollment at the SWCD office in Sleepy Eye, Rathman spent most of the 2001 winter planning the project and selecting what to plant. "I wanted my land to be as diverse as possible. I wanted to attract as much wildlife as I could. Hopefully one day when I look out at my field from my house I will not only have prairie chickens, partridge, and pheasants back on my land but many types of small creatures like butterflies as well." To accomplish that goal Gary knew he had to plant variety to get variety. Gary planted over 248 species of wildflowers and 23 different species of grasses native to the area on a 122-acre field. Gary's planning is already paying off. In just the first year, hundreds of wildflowers were in bloom during different stages of the summer and the short and tall prairie grasses are starting to take hold. The Rathman CREP Prairie Restoration is planned to be a part of the Brown County Watershed Conservation Tour in August of 2003. The Rathman farm is located in the Little Cottonwood and Watonwan River Watersheds.

Not only does Gary have some prairie being restored but also some buffer strips along a drainage ditch to help prevent runoff from entering the surface water. Pictured above Gary Rathman stands in a dense planting of switch grass along a drainage ditch on his property in southern Brown County.

Roland Richert, Hanlow township, also decided to enroll some of his land into the CREP program. Roland has his reasons for enrolling 116 acres into the program. "It is marginal crop land. In wet years the bottomland would flood and the sandy soil would produce. During dry years the bottomland would produce but the sandy soil would burn. In the best years, this was 170-bushel corn but with more frequent flooding and rotten grain prices, CREP became a lifesaver. It saves so much soil from

Roland Richert stands in front of a 116-acre field recently enrolled in the CREP program along the Little Cottonwood River.

Pictured above, prairie blazing star flower, just one of many prairie forbs blooming during the first growing season. Over 240 varieties of wildflowers were planted on the 122-acre field at the Rathman farm. The prairie was recently restored through Minnesota's Conservation Reserve Enhancement Program that returns marginal farmland into a permanent easement for water quality, and habitat, purposes within the Minnesota River Basin. (Photos by Gary Rathman)

'Leaving a Conservatoin Legacy', 2003


CREP

Minnesota River

Little Cottonwood River Watershed Project

Clean Water Partnership

Phase II Implementation

Interim Report

March 2001-March 2005

April, 2005

'Interim Report', 2005

Buffer Initiative CRP payment card insert

Buffer Strip Initiative Letter Com

Conservation Tour

In June of 2004 a special bus tour was sponsored by the project in collaboration with the Brown County SWCD, NRCS and FSA. The purpose of the project was to give policy makers a firsthand view of the numerous conservation efforts that had taken place to protect the quality and sustainability of the watersheds soil and water resources. The tour consisted of ten stops and topics ranging from milk house wastewater treatment using EQIP and watershed funding to restore prairies and wetlands through CRP and CREP. About 40 people participated in the day long tour.

Website

In 2005, the watershed project worked with the Water Resources Center at Minnesota State University to develop a website that would host information about the project. The website provided a one stop location to retrieve a variety of information about the project ranging from water quality data, newsletters, conservation program information for farmers, septic loan applications, and educational materials for teachers and students. One of the most popular and visited portions of the website featured an interactive tour of the LCR watershed. The site can be accessed at the following URL web address. http://mrbdc.mnsu.edu/org/bnc/

Children's Water Festival

The watershed project provided education to watershed school children by helping sponsor the annual Children's Water Festival from 2001-2007. The annual Children's Water Festival is a one-day event, heightening the awareness and importance of our most valuable resource — water.

Each year about 1,000 fourth graders from Brown, Nicollet and Cottonwood Counties have the opportunity to participate in a fun-filled day of water-related activities at a Children's Water Festival. The day is filled with hands-on activities, an exhibit hall, and entertainment.

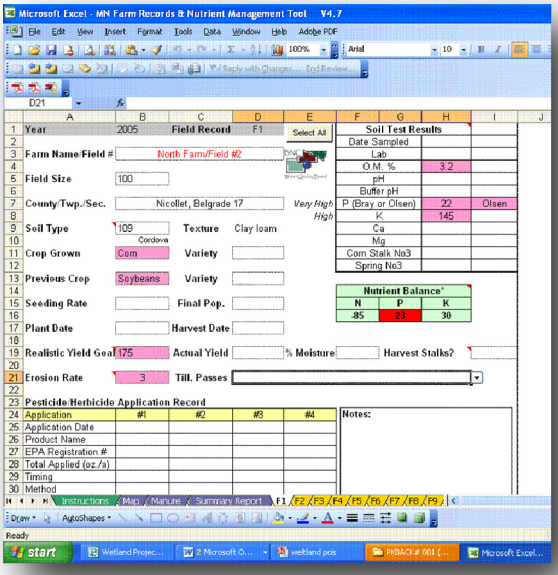
Water Festivals have become an enormous success in Minnesota and around the country. The first water festival was sponsored by the Nebraska Groundwater Foundation in Grand Island in 1989. The BNC Water Quality Board held its first festival in 1999, and has sponsored one each year since that time.

Students have fun learning about water and are exposed to adult role models in water-related and environmental fields of employment and volunteerism.
The Water Festival is held each March at the South Central College Campus in North Mankato and is led by a volunteer steering committee and many other support committees. Teachers appreciate the opportunity to bring their students to one location where many experts are available. They like the hands-on learning and field day atmosphere, and it allows teachers to obtain the most current information about water resources to take back to their classrooms.

On Farm Nutrient Management Demonstrations and Planning Tools

In effort to increase the adoption of nutrient management, on-farm demonstrations were used. Watershed staff worked with four producers to compare conventional nutrient management versus management recommended by the University of Minnesota. One example was through the use of On-Farm Nitrogen Rate Demonstrations to show corn producers which rate of nitrogen is both economically and environmentally sound. New technologies such as GPS enabled yield monitors were used for the study. Several summaries and workshops were held for area farmers and agronomists to showcase the results. The studies have shown that 93% of the demonstration trials need 40 lbs./acre less nitrogen than conventional rates. These results validate University of MN Extension Recommendations and show that most farmers could increase profits by $10-$20/acre while at the same time dramatically decreasing the potential for nitrogen loss to the environment. Private crop consultants such as Blue Earth Consulting/Agronomics were key players in helping promote the on-farm demonstration concept.

In addition to on-farm demonstrations a special Nutrient Management Planner spreadsheet tool was created. The user friendly computer program was developed to help farmers and agri-businesses fine-tune the management of their nutrient applications and records. The spreadsheet automatically calculates how much fertilizer to apply in accordance with environmental and economic factors. The program also helps determine Conservation Security Program eligibility. This tool was found to be very useful in helping provide education and outreach regarding the proper crediting of manure and legume sources and general nutrient management accounting principles.



The underlying assumption of this project was that were a variety of great programs available to landowners, however there were very few people actively and effectively promoting them. With funding from the Clean Water Partnership Program, two positions were created to help facilitate the adoption of conservation practices, a Technical Service Representative and a Conservation Liaison. This approach proved to be a successful management technique. These positions were instrumental in leveraging the skills of conservation partners, new and existing conservation programs and ultimately increasing conservation adoption rates. Special focus was placed on securing environmentally sensitive cropland acres into CREP and CRP.

By the end of the project in 2007, a total of 2,835 acres of permanent conservation easements were enrolled in the Conservation Reserve Enhancement Program. A total of 1,275 acres or 45% of the easements were located within the 100-year floodplain. The remaining acres were associated with riparian buffers and restored wetlands. In addition, project staff helped promote and deliver Continuous CRP filter strip and wetland restoration practices within the watershed. An additional 700 acres were installed as a result of this effort.

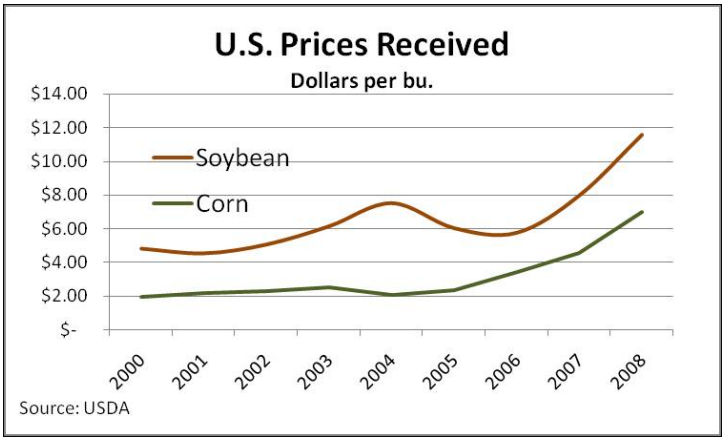
Installing riparian buffers along environmentally sensitive cropland was a very high priority during the project implementation phase. It is estimated that prior to the adoption of CREP and CRP, about 43 miles or 27% of the LCR main stem and its tributaries were buffered. Through the combined efforts of the watershed project and its partners, the amount of buffers in the watershed increased substantially. Remarkably, 105 miles or 65% of the riparian corridors within the watershed are adequately buffered from cropland practices. This represents an increase of 60 miles of buffers (140% increase).

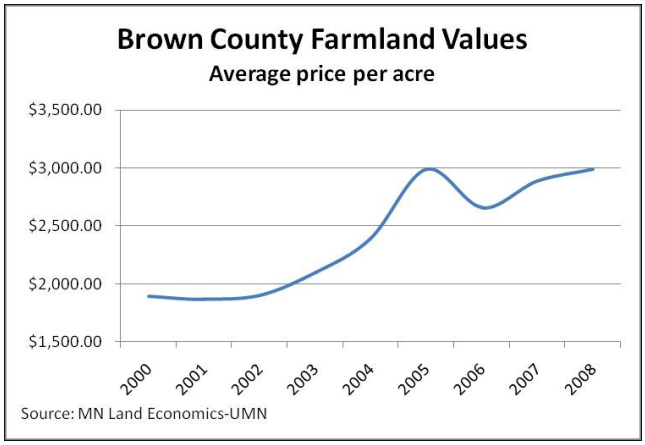
Timing

To a degree the substantial increase in conservation practice adoption within the watershed can be credited to the watershed project, staff and its partners. However, it would be remiss to not mention the importance of timing. It was fortunate the project was able to leverage the economic climate, funding and support of new and existing state and federal programs such as CREP and CCRP.

Perhaps the most important factor with respect to timing had to do with the economic conditions associated with the agricultural economy during the project time period. Most of the conservation that was adopted in the watershed took place from 2000-2004. During that time period crop prices averaged about 2.26/bu for corn and 5.81/bu for soybeans. Profit potential for these crops was relatively low, especially for marginal areas that had limitations associated with flooding, and prone to erosion. However, beginning in 2007 a dramatic increase in crop and land prices occurred. Due to increases associated with global demand for US commodities, regional bio-fuel demand, crude oil prices and speculative investing, corn and soybean prices have more than doubled. Future prices are expected to reach even higher.

There is little doubt that 2007 and 2008 will go down in history as one of the most remarkable and volatile years in US agriculture. Due to the increased demand for cropland, there is also little doubt that conservation practice adoption would not have been as high if the project would have started in 2008 versus 2002. As the strong trend continues for US commodities, land in programs like CRP will go back into production much sooner than anticipated and with that follows the concern that soil and water conservation efforts will be diminished. Fortunately, over a one third of the easements in the watershed are in CREP and will remain a permanent fixture of the landscape; however it will be necessary for watershed groups and SWCDs to continue to emphasize targeting of conservation in the watershed and providing additional incentives for producers to leave these practices on the landscape. As more pressure is put on the land to produce food, fiber, *and* fuel there will be an equal amount of pressure for a subsidence in conservation. Therefore, precision conservation will become imperative in effort to minimize cropland taken out of production. One possible incentive that may help entice landowners to leave these environmentally sensitive areas out of production is a state and/or federal income/property tax credit program.





At the onset of the project, three primary goals were established:

1) Establish 1,500 acres of permanent conservation easements within the 100 Year floodplain to address flooding and water quality issues.
2) Increase the enrollment of conservation buffers and small wetlands along the main stem of the LCR River and tributaries.
3) Achieve a sediment load reduction of 25%, phosphorus reduction of 30%, a reversal of increasing nitrate levels, and pathogens such as E. coli bacteria.

Did the project achieve these goals? Without question the first two goals were accomplished with great success and are demonstrated by over 3,000 acres of additional wetland restorations, permanent flood-plain easements and an additional 60 miles of streams buffered. However, the most important question pertains to the third goal. Will those accomplishments transcend into sustained water quality improvements at the watershed scale?

It may be too early to accurately assess whether there are any watershed scale water quality improvements resulting from the project, but the watershed project did clearly demonstrate the importance of people. This project demonstrated that it takes people devoted to the promotion, outreach, and nurturing of personal relationships with landowners and project partners to achieve significant watershed scale conservation adoption achievements.

Listed below is a summary of lessons learned, successes, challenges and recommendations for possible future related activities in the watershed and greater Minnesota River Basin.

Project Successes

The success of this project hinged most on our ability to provide efficient and effective technical assistance to landowners. Clean Water Partnership funding provided us with the infusion of staff and flexible financial resources to leverage new and existing programs. I cannot emphasize enough how important it was to have additional local technical and coordination staff with this project. Through this project we were able to promote, enroll, design and devote the necessary follow-up needed to increase conservation adoption. Above all we were able to develop personal relationships which helped us foster our watershed goals. Listed below are other activities that are attributed to the success to the project.

- Technical Assistance Representatives and Liaisons. Project staff filled a critical gap between the conservation programs and the landowners that could benefit from them. Through funding provided by this grant an equivalent half-time watershed technician and coordinator was employed to fill administrative and technical service niches. Staff from this project helped build and strengthen personal relationships, trust, and partnerships among landowners, farmers, agencies, and organizations.
- Project staff were instrumental in helping streamline the CRP sign-up process between the Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS) and providing the quality of customer service needed to make the programs successful.
- Project staff were not co-located with the USDA, or SWCD. In some ways this made it more difficult to ensure proper communication, but in many other ways it was more efficient. For instance staff duties did not get diluted with other administrative duties often found in local conservation offices. They had one priority and that was to work in the watershed and to sell and promote conservation. Also, producers sometimes were more willing to work with someone from the watershed project rather than a formal governmental agency. For instance, project staff used their own personal vehicles and did not use government vehicles. It was felt that this actually helped make some landowners feel more comfortable and the staff less threatening.
- Using Geographic Information Systems analysis, landowners that were eligible for various conservation programs were identified. Soils information along with current land use information and air photos were very important in helping target our marketing efforts.
- Marketing of the CREP and CCRP program consisted primarily of proposals mailed to the landowners clearly showing how much landowners could receive if they enrolled into the program. The proposals contained an air

photo and payment estimate. The letter was usually followed up with a phone call or on-site visit.

Project Challenges

Most of the challenges that were encountered through this project were related to the administration of programs used to enroll farmland into conservation set aside programs. During the project timeline, significant administrative duties changed for the agencies which are responsible for the federal CRP program. For example, prior to the start of this project the FSA and NRCS offices shared responsibilities for the CRP. However, during the time we were actively promoting these programs, responsibilities were shifted entirely to the FSA. This created some problems since FSA has very limited staff to manage the technical provisions of the CRP program. At about the same time the NRCS and FSA experienced staffing cuts, while administrative duties increased. As a result, we had to rely more on our own staff to complete many of the projects and therefore limited the expansion and scale of our projects.

There were also some communication challenges. The effectiveness of our outreach efforts to promote conservation tillage, buffers, and nutrient management were sometimes hard to quantify. For instance, since we were not co-located in the Brown or Cottonwood USDA Service Centers, we sometimes did not receive any information back from our project partners regarding interest level or signups in programs. For instance, we knew there were many new additional EQIP sign-ups for reduced tillage and nutrient management; however we were not made aware if any those landowners were the result of our educational efforts.

Other challenges experienced included:

- A variety of other BMPs were listed in the work plan and early on in the project we began to look for ways to promote the adoption of conservation tillage and nutrient management. We had very little success with these practices, yet they were practices that were considered to be the most sustainable and projected to have the greatest long-term benefit on water quality. Agronomists, seed dealers, private crop consultants, Coops and equipment dealers have the biggest influence with regards to these two BMPs and it would take many more years of building trust and relationships among these different groups before collaboration at the watershed scale could be attained.
- It is suspected that a lot of the current turbidity issues in the LCR associated with the re-suspension of channel sediment that has been deposited in the middle portion of the watershed. The res-suspension is due to cattle that have free access to the stream during the summer months. The project worked hard to find producers that would be willing to fence their cattle away from the streams and to use remote watering systems to minimize turbidity. However we did not have any cooperators even when offering 90% cost-share for demonstration purposes.

- We had very little luck with promoting CREP and CRP in the Cottonwood County portion of the watershed. It appeared that this was not the result of landowner disinterest in the programs, but affiliated with administrative issues at the Farm Service Agency level.
- The influence of the Federal Farm Policy on conservation cannot be overstated. There is a dichotomy between federal farm bill subsidies and conservation. Since commodity subsidies are based on the amount of acres and bushels produced, landowners can be penalized if they convert cropland to CRP or grow perennial non-row crop type crops like alfalfa instead of corn or soybeans. The structure of the farm bill during this project time period created more additional programs for landowners to adopt conservation. However, we often found that commodity subsidies (LDPs, CCPs, etc for corn and soybeans) often deterred the enrollment of farmland into conservation set aside programs like CRP. For instance, in many cases if a producer enrolled 20 acres of cropland into CRP, they could also forfeit future government subsidies on those acres. These subsidies could account for up to $30-$50/acre. Current farm bill subsidies reward farmers based on how much corn is produced. Therefore, if land is taken out of production and placed into a conservation program, landowners are penalized through a potential loss in corn or soybean subsidy payments. Federal farm bill policies should provide a safety net based on the level of conservation on farms rather than the amount of corn bushels produced or corn acres planted.
- Communication. There continues to be a need and opportunity for more communication among the agencies and policy makers which administer conservation programs. A break in communication can jeopardize the trust established between conservation technicians and landowners.
- To a certain degree high attrition rates experienced in some counties among conservation staff can be attributed to the poor communication and inefficiencies experienced at the local level.
- A significant opportunity continues to exist between the many conservation programs that are available through the Farm Service Agency and Natural Resources Conservation Service and the landowners and farmers which could benefit from them. We have found that many landowners simply do not understand the programs and get frustrated if they do not have someone helping them during the entire process.
- Most landowners need special and increased assistance with planning, planting, and maintenance of conservation programs. This was especially evident with mechanical mowing and prescribed burning practices of the upland wetland buffers.
- Soil Rental Rates used to calculate often lag by $20-$30/acre or more making wetland restoration practices like those in the CRP a difficult sell. Trade distorting subsidies compound the problem by elevating land rental rates and land values.

- Perhaps one of the biggest obstacles to conservation adoption in the watershed pertains to the fact that that most producers that farm the land do not own the land. This situation can lead to less land stewardship and sustainability. It is estimated that about 60% of the land in the LCR watershed is not farmed by the landowner. This growing trend of more renters often complicates and stifles conservation adoption. For instance, if a renter observes obvious signs of soil erosion in a field that could benefit from a grass waterway, the renter typically will not seek to fix the problem. There is little incentive since the renter will most likely lose those acres if it is enrolled into a program and any compensation from conservation programs will go to the landowner and not the renter. We have found that the landowner is often not aware of the excessive erosion that is taking place on their farm.
- Due to privacy policies it was difficult to obtain GIS information (Common Land Unit Shape file) from NRCS and FSA offices for helping promote and target the conservation programs. This created inefficiency and data duplication.
- Due to the nature of grant funded positions, it is sometimes difficult to maintain consistent quality staff. Fortunately for this project the coordinator and technician stayed with the project up until the last year of the grant. This provided continuity to the project. This situation is very unique. Most watershed staff that are funded by grant based positions do not stay for more than a few years. This can create extreme inefficiency and limited productivity. It is very difficult to establish relationships and trust with watershed landowners when there are high rates of staff turnover.
- In relation to this issue, the very nature of grant based positions can decrease the ability for the coordinator/liaison or technician to actively promote the programs. For instance, by the end of the LCR watershed project as many as 17 grants were needed to continue to employ the coordinator/liaison and technician positions. Many of the grants were small, but required just as much reporting as the bigger grants. Each grant requires its own set of reporting, budget accounting and administrative requirements. All of this takes away from the main duties of these positions and limits how much time is spent in the watersheds. Without sustainable funding for project staff, the project itself is not sustainable and can become inefficient.

Recommendations

Listed below are nine recommendations that could help enhance any future activities related to the restoration of the Little Cottonwood River and/or greater Middle Minnesota Major Watershed.

1) Federal Farm Bill and Trade Distorting Policies

Trade distorting policies should be changed so that price support systems for America's farmers are associated with the level of conservation which is practiced rather than by the quantity of a commodity produced. The Conservation Security Program (CSP), was suppose to help create this change. Unfortunately, the program never became a viable program due funding limitations and extreme complexity of the program. However, if managed and funded properly "Green payments" still have the potential to dramatically increase the interest, sustainability and widespread adoption of conservation practices.

2) Dedicating Permanent Funding for Technical Service Representatives and Watershed Coordinators/Liaisons at the local County and Watershed Level.

Technical assistance representatives and watershed coordinators/conservation liaisons were found to be extremely important to this project and showcase the impact they can have for getting conservation on the ground. These positions were critical for strengthening and leveraging programs and partners, assisting landowners with conservation programs such as marketing, design, construction, and maintenance of conservation practices, as well as developing and sustaining personal relationships and trust among watershed landowners, farmers and contractors. These local positions act as a bridge between federal and state programs, crop consultants and drainage industry, and the landowners and farmers that could benefit from them. Currently, there simply isn't enough funding to keep local watershed project technicians sustained at the local level. These positions should have fundamental knowledge of conservation planning and whole farm planning.

Technical Service Representative (TSR)— Employed through the local Soil and Water Conservation District and/or Water Quality/Watershed Organization. This person has a working knowledge of all the conservation programs and helps market and advertise these programs to landowners and farmers. This person also coordinates the installation and maintenance of the conservation program. Conservation Liaison (CL)— This person has a working knowledge of all responsibilities associated with the TSR but also helps strengthen communication among local, state and federal agencies and other private organizations. This person also helps leverage other programs, grants and partners and helps streamline and improve the efficiency of delivering conservation practices where they are needed.

3) Minnesota's Clean Water Legacy Legislation

This Minnesota legislation would designate about $40-$80 million dollars a year to cleaning up impaired waters within the state. If funded and appropriated properly this state Act could provide the dedicated funding needed to keep or hire additional technical service representatives and conservation liaisons at the watershed and county level.

4) Precision Conservation

Due to the current economic climate associated with agricultural commodities, conservation set aside programs that were promoted through this project like CREP and CRP will likely have very little interest in the future. In addition there will be great pressure on the land to produce more. Marginal crop acres such as highly erodible land, existing CRP, fence rows, buffers, pastures, and even grass waterways may go into production in the future. Therefore, there will be a greater need to target conservation on the land that will minimize the amount of land taken out of production, yet maximizes soil and water conservation. For instance, most of the sediment and phosphorus delivered from a drainage ditch may be derived from delivered from just 20% of ditch miles but contributing to 80% of the problem. Field surveys, rapid watershed assessments, ditch inspections, and detailed elevation data like LiDAR, will be very important tools to help target conservation.

5) Buffer Side inlets with perennial vegetation and appropriate sizing of culverts

Related to item four, place conservation buffers along drainage ditches that have side inlet drainage structures. It is theorized that most of the sediment and phosphorus associated with drainage ditches is derived from side inlets. Where possible downsize new and existing side inlet culverts to help maximize flood storage (6-48 hr. storage)

6) Tax Incentives

One of the biggest concerns by landowners with perpetual conservation easements is that even though the land is set aside for conservation purposes it is still taxed at the cropland tax rate. This attribute can provide a disincentive for landowners to enroll their land into a permanent conservation program like CREP.

In addition most of the cynicism we received from landowners was that many of the programs like CSP, EQIP and CRP tended to be too complicated and bureaucratic.

One alternative would be to create an incentive that would be associated with a state and or federal income tax credit. For instance, if a landowner wanted to restore a wetland and the wetland provided public benefit by reducing flooding and removing nitrates, the landowner could claim a tax credit up to certain dollar amount for up to 10-20 years. This would provide the incentive to the landowner to install and maintain the practice. This concept could also be applied to septic systems, vegetated filter strips along drainage ditches and tributaries, etc.

7) Additional Conservation Planners at the Township and Watershed Scale.

Local USDA and SWCD conservation field technicians typically do not have enough time to effectively administer the development and maintenance of conservation plans. A recommendation would be to have a full-time person devoted to developing conservation plans. This position would be focused on working closely with producers at the township and watershed scale (<25,000 acres). This person would develop conservation plans for each producer and landowner and ensure that they are updated and practiced on an annual basis.

8) Market Based Trading

Another strategy that could increase the adoption of conservation is through market based solutions tied to efforts to reduce global climate change. Although very different environmental issues, climate change mitigation and water quality improvements are interrelated, since any decreases in nitrogen reaching waterways from agricultural land use practices have implications for nitrous oxide emissions, a potent green house gas. Moreover, agricultural practices and management decisions that slow the rate of nutrient losses to waterways frequently improve carbon sequestration and storage in the soil. For instance, under a nutrient trading program, farmers could be paid according to the size of nitrate and carbon reductions they achieve by integrating nutrient reducing wetlands on their land. Municipalities or other large scale polluters that find it expensive to reduce nutrient emissions could buy allowances or credits from a farmer with a wetland. The price for the net reduction achieved by the wetland would be determined by supply and demand forces as well as the value society places on clean water. These market based efforts could also help address non-point pollution provisions, Total Maximum Daily Loads (TMDLs), of the 1972 Federal Clean Water Act. Thus, a single environmental market based strategy combined with wetland restoration practices has the potential to address multiple issues simultaneously.

9) Develop a Continuous CRP practice that would allow landowners to enroll cropland along ravines to help reduce accelerated overland runoff, sediment/phosphorus and delivery tile drainage maintenance issues. UPDATE: Through special efforts by the watershed project a CCRP practice (CP38b) became available to landowners in early 2008.

10) Strengthen and/develop local, state and federal ordinances associated with soil loss, shoreland, cattle access to streams, manure/herbicide/pesticide/ravine setbacks and septic system compliance. This will take additional staff at the local level devoted to enforce existing laws when all voluntary compliance initiatives and programs are exhausted.

Final Expenditures

The information provided in this chapter pertains to the final expenditures and in-kind matches for the project. The information presented represents the 2005-2008 time period of the Clean Water Partnership Implementation project. The expenditures pertaining to the first half of the project (2001 through 2004) are located in the 'Interim Report' within the appendix of this report.

It is important to note that this project demonstrated a very high level of leveraging. With this grant we were able to leverage a $200,000 McKnight Foundation grant, $2,000 Pheasants Forever Grant and $30,000 Farm Bill Assistance Funding.

Little Cottonwood Project Jun-08
Final Expenditures, 2005-2008

		CASH						IN-KIND					
Program Element	Budget	2008 Expenses	2007 Expenses	2006 Expenses	2005 Expenses	YTD Expense	Balance	Budget	2008 Expenses	2007 Expenses	2006 Expenses	2005 Expenses	YTD Expenses	Balance
1A - Planning														
1A-1 Workplan Dev.														
Labor	1380.00			494.00	2871.00	3335.00	-1945.00	1915.00			435.00		435.00	1480.00
1 Overall Expenses														
Travel	150.00						150.00							
Equipment	500.00			91.00		91.00	409.00							
Supplies	400.00				193.14	193.14	206.86							
Program Element 1 Subtotals	2430.00			585.00	3064.14	3619.14	-1178.14	1915.00			435.00		435.00	1480.00
2-BEST MANAGEMENT PRACTICES PROMOTION & DEMONSTRATIONS														
2A-1 Continuous CRP Practices														
Labor	6880.00		1145.90	2148.00	8185.25	11478.75	-4798.75	1800.00		2494.00	290.00	1885.00	4889.00	-3089.00
Ed. Materials	1620.00		158.24			158.24	1461.76							
Tech. Contracts	1700.00			979.87		979.87	720.13							
2A-2 Tile Intake Alternatives														
Labor	1920.00				348.00	348.00	1572.00	1800.00		590.00		809.00	1189.00	611.00
Tech. Contracts	2000.00		600.00			600.00	1400.00			247.83			247.83	-247.83
2A-3 Conservation Tillage														
Labor	2500.00				3944.00	3944.00	-1444.00	1800.00						1800.00
2A-4 Conservation Drainage Demos														
Labor	3000.00			304.50	59.00	363.50	2636.50	1800.00		130.50		87.00	217.50	1382.50
2A-5 Other Innovative Conservation Practices														
Labor	3500.00		775.75		0.00	775.75	2724.25	800.00						800.00
Tech Contracts	500.00			1001.75		1001.75	-501.75							
2A-6 Nutrient Management Demos														
Labor	5080.00			203.00	377.00	580.00	4480.00	800.00		14.50			14.50	785.50
Tech Contracts	1000.00		29.00			29.00	971.00							
2A Overall Expenses														
Travel	1450.00		99.18	284.78	718.42	1042.38	407.62							
Equipment	900.00						900.00							
Supplies	100.00			179.09	341.05	520.14	-420.14							
Program Element 2A Subtotals	31630.00		2767.67	5878.99	13972.72	21619.38	9710.62	9000.00		3486.83	290.00	2581.00	6337.83	1662.17

Program Element 2B - Animal Waste/Runoff														
2B-1	**Manure & Feedlot Management**													
	Labor	5190.00			594.50	130.50	725.00	4465.00	6000.00			1740.00		1740.00	6260.00
	Tech Contracts	1100.00						1100.00							
2B Overall Expenses															
	Travel	1350.00			129.06	16.80	145.86	1204.34							
	Equip/Supplies	100.00						100.00							
Program Element 2B - Subtotals		**7740.00**			**723.56**	**147.10**	**870.86**	**6869.34**	**6000.00**			**1740.00**		**1740.00**	**6260.00**
Program Element 2C - Conservation Planning															
2C-1	**Conservation Planning/Nutrient Management**														
	Labor	6550.00			1421.00		1421.00	5129.00	2500.00						2500.00
	Contracts	1500.00			490.00		490.00	1050.00							
2C Overall Expenses															
	Travel	900.00			28.93		28.93	871.07							
	Equipment	150.00						150.00							
Program Element 2C - Subtotals		**9100.00**			**1899.93**	**0.00**	**1899.93**	**7200.07**	**2500.00**				**0.00**	**0.00**	**2500.00**
2D Impacts of Sewage															
2D-1	**Low Interest Loans**														
	Labor	770.00		1328.75	217.50	116.00	1660.25	-890.25	17500.00		3345.00	2270.50	319.00	5934.50	11565.50
	Citizens Contribution								50000.00		50278.00	24705.81	30119.06	105100.87	-55100.87
2D OVerall Expenses															
	Travel	250.00		87.79	16.69		108.48	143.52							
	Equipment	250.00						250.00							
	Supplies	230.00		176.33		15.17	191.50	38.50							
Program Element 2D - Subtotals		**1500.00**		**1592.87**	**236.19**	**131.17**	**1959.23**	**-459.23**	**67500.00**		**53623.00**	**26976.41**	**30438.06**	**111035.47**	**-43535.47**
Program Element 3 - Monitoring															
3-1	**Site 4**														
	Labor	7160.00		3748.25	1609.50	319.00	5676.75	1483.25	14695.00		1152.75	174.00	783.00	2109.75	12585.25
	Lab Analysis	4500.00		2688.40	1240.40	1138.12	5048.92	-548.92							
	USGS Station	6000.00		2000.00		7130.00	9130.00	-1130.00							
3-2	**Other Sites**														
	Labor	600.00		2327.25			2327.25	-1727.25	645.00		248.50			248.50	598.50
	Lab Analysis	900.00						900.00							
3-2 Overall Expenses															
	Travel	4500.00		1278.90	462.98	350.77	2092.65	2407.35			48.50			48.50	-48.50
	Equipment	500.00		6008.37	647.59	28.08	6680.04	-6180.04			250.00	250.00		500.00	-500.00
Program Element 3 - Subtotals		**25760.00**		**18629.17**	**3960.47**	**8983.97**	**30963.81**	**-6183.81**	**15680.00**		**1697.75**	**424.00**	**783.00**	**2904.75**	**12595.25**
Program Element 4 - Education & Outreach															
4-1	**Newsletters**														
	Labor	4035.00	703.25	248.50		188.50	1138.25	2896.75	1000.00	280.00		29.00		319.00	881.00
	Ed. Materials	5100.00	1058.00			141.77	1197.77	3902.23							
4-2	**Presentations & Media**														
	Labor	2115.00		2073.50	1029.50		3103.00	-988.00	500.00						500.00
	Supplies	250.00		81.95	31.95	35.00	128.90	121.10							
	Travel	550.00		0.00		147.36	147.36	402.64							
	Conf			150.00	980.00	26.66	756.66	-756.66							
4-3	**Schools & Festivals**														
	Labor	1920.00			217.50		217.50	1702.50	2400.00		2073.50			2073.50	326.50
	Supplies	250.00						250.00			300.00			300.00	-300.00
4-4	**Middle MR & Basin Projects**														
	Labor	460.00		4508.50	833.75		5343.25	-4883.25	2400.00		1392.00			1392.00	1008.00
	Supplies/Postage	50.00		57.72			57.72	-7.72							
4-5	**Website Management**														
	Labor	2500.00				585.50	585.50	1934.50	1930.00		670.00			670.00	1060.00
	Tech Contracts	2000.00				173.87	173.87	1826.13							
	Supplies	80.00						80.00							
4	**Overall Expenses**														
	Travel	750.00		441.86	491.15	68.27	1001.08	-251.08							
Program Element 4 - Subtotals		**20860.00**	**1760.25**	**7560.03**	**3183.85**	**1346.93**	**13830.86**	**6229.14**	**8230.00**	**280.00**	**4635.50**	**29.00**	**0.00**	**4864.50**	**3275.50**

Program Element 6 - Data Mgmt & Eval														
6-1	GIS Projects													
	Labor	5700.00		2211.25	7003.50		9214.75	-3514.75	15500.00			1780.00		1780.00	13740.00
	Equipment	1500.00		1694.38	980.72	2537.36	5212.46	-3712.46	1000.00		304.92	333.24	222.22	860.38	139.62
	Technical Contract w/MSUM	1500.00				1703.31	1703.31	-203.31							
6-2	Technical Committee														
	Labor	4320.00		29.00	754.00	957.00	1740.00	2580.00	3500.00						3500.00
6-3	Reporting														
	Labor	9410.00	3000.00	3284.25	3181.00	2985.25	12410.50	-3000.50	8500.00	1180.00				1180.00	5340.00
6 OVerall Expenses															
	Mileage	500.00		126.10			126.10	373.90							
	Supplies	250.00		771.11	361.28	80.35	1232.74	-982.74							
Program Element 6 - Subtotals		**23160.00**	**3000.00**	**8316.09**	**12280.50**	**6243.27**	**31839.86**	**-8679.86**	**28500.00**	**1180.00**	**304.92**	**2093.24**	**222.22**	**3780.38**	**22719.62**
Program Element 6 - Administration															
6-1	Communications														
	Labor	4320.00		4009.25	2929.00	2871.00	9809.25	-5489.25	4500.00		5948.50	595.50	558.25	7070.25	-2570.25
6-2	Fiscal Management														
	Labor	4320.00		2204.00	1169.00	484.00	3857.00	463.00	23000.00	435.00	2508.50	2943.50	1631.25	7518.25	15481.75
	Tech Contracts/Fiscal Costs	29000.00	1295.97	11743.83	10192.57	4853.48	28085.83	-3085.83							
	Equipment/Misc.								10500.00	874.98	3499.92	3499.92	2333.31	10208.13	291.87
6-3	Project Direction														
	Labor	1996.00		1840.75	2146.00	333.50	4320.25	-2332.25	3000.00		4283.50	2088.00	258.75	6630.25	-3630.25
	Per Diems			840.00	300.00	180.00	1320.00	-1320.00			480.00	840.00		1320.00	-1320.00
6 Overall Expenses															
	Mileage	500.00		545.80	347.06	308.09	1201.03	-701.03			315.25	576.20	131.82	1023.07	-1023.07
	Supplies	250.00		751.07	1077.84	473.30	2302.21	-2052.21							
															0.00
Program Element 6 - Subtotals		**36386.00**	**1295.97**	**21942.78**	**18161.47**	**9483.35**	**50883.57**	**-14497.57**	**41000.00**	**1309.98**	**17033.67**	**10513.12**	**4913.18**	**33769.95**	**7230.05**

	Budget	2008 Expenses	2007 Expenses	2006 Expenses	2005 Expenses	YTD Expense	Balance	Budget	2008 Expenses	2007 Expenses	2006 Expenses	2005 Expenses	YTD Expenses	Balance
Program Element 1	2460.00			595.00	3084.14	3819.14	-1179.14	1915.00			435.00		435.00	1480.00
Program Element 2A	31530.00		2767.87	5076.99	13972.72	21819.30	9710.62	6000.00		3466.83	280.00	2561.00	6337.83	1662.17
Program Element 2B	7740.00			723.56	147.10	870.66	6869.34	6000.00			1740.00		1740.00	6260.00
Program Element 2C	9100.00			1899.93		1899.93	7200.07	2500.00						2500.00
Program Element 2D	1900.00		1590.87	236.19	131.17	1958.23	-458.23	67500.00		53821.00	28978.11	30638.06	111035.17	-43535.17
Program Element 3	25760.00		18029.17	3980.47	6983.97	30953.61	-5193.61	15500.00		1697.75	424.00	783.00	2904.75	12595.25
Program Element 4	20060.00	1759.25	7540.83	3163.65	1346.93	13830.66	6229.14	6230.00	280.00	4635.50	29.00		4954.50	3275.50
Program Element 5	23160.00	3000.00	8316.09	12280.50	6243.27	31839.86	-8679.86	28500.00	1180.00	304.92	2093.24	222.22	3780.38	22719.62
Program Element 6	36386.00	1295.97	21942.78	18161.47	9483.35	50883.57	-14497.57	41000.00	1309.98	17033.67	10513.12	4913.18	33769.95	7230.05
TOTALS:														
	$167,896.00	**$6,055.22**	**$80,187.41**	**$46,889.86**	**$45,352.65**	**$167,896.24**	**$0.76**	**$179,145.00**	**$2,768.98**	**$86,769.67**	**$42,680.47**	**$36,837.48**	**$164,957.58**	**$14,187.42**

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Final Report Format

Section 319 and Clean Water Partnership Projects or Final Progress Report for TMDL Development and TMDL Implementation Projects

The Minnesota Pollution Control Agency (MPCA) provides grants to organizations to help fulfill the agency's mission. Each grant project is required to complete a final report. Information from this grant report will be used to illustrate progress toward meeting the MPCA's goals and missions and will be shared with interested parties, targeted audiences, and legislators.

More information about preparing a final project report for a Section 319 grant can be found at http://www.epa.gov/owow/nps/sec-319.pdf. This notebook describes the purpose of Section 319 final reports, the information that should be included in the report, examples of especially effective elements from 319 reports, and ways to expand the final report to be used for outreach and education, building partnerships, and many other uses.

Instructions

This grant report must be submitted ***no later than 30 days after the end of the grant contract***. It must include results, in the form of data and information, that best demonstrate achievement of project goals and objectives.

Please follow the attached report format, referring back to the work plan and budget and any subsequent amendments to your grant agreement, contract, or work order. When completed, send an electronic copy of the completed report to your MPCA project manager for review.

Failure to submit a completed report may result in the return of grant funds and/or the withholding of the final payment.

Body of Main Report

Section I – Work Plan Review

- Briefly outline any approved changes from the original work plan, staff, or participating organizations.
- Please list and give a brief report on each activity/task identified in your work plan (Attachment A of the 319 Grant Agreement, contract, or work order) or most recently approved work plan amendment. For each task, briefly summarize the activities completed and describe any problems, delays, or difficulties that have occurred in completing the project work. Explain how problems were resolved or list any activities that were not completed.

Section II – Grant Results

For TMDL Development Projects describe the work products of the contract, such as a written TMDL or technical report, data files, maps, and any other attachments that were produced by the project.

- **Measurements:** Please describe your evaluation plan and its results.
  - What tools did you use, what methods did you use to gather information?
  - If you did a survey, what was the sample size and what was the response rate, how did you analyze the results, evaluate the monitoring data, etc.?
  - If you have measurable environmental results, such as pounds of chemicals reduced, best management practices installed, pollutants prevented, waste eliminated, changes in water quality, resources conserved, etc., also include those here.
- **Products:** Please list, and attach copies of any documents or products that have been produced during the reporting period, including monitoring data (if applicable, including the electronic summary of all data for the STORET data base), brochures, articles, special reports, tapes, CDs, etc. Provide relevant project photographs.

  Note about photos: Photos may be scenes of the water resource in question and/or may illustrate installations, Best Management Practices (BMPs), or other measures that help show what the project accomplished. **Attached electronic files (e.g. JPGs) are preferred.** For questions about photos, please contact your regional MPCA Public Information Officer or Jennifer Groebner at 651-296-7706.

  Note for TMDL development projects and TMDL implementation projects: All project monitoring data must be approved in the federal STORET data system and all best management practices implementation activities must be inputted into the state eLINK system before the final report will be approved and final project payment will be made.
- **Public outreach and education:** If part of your work plan, please evaluate the effectiveness of public participation and education plans for the project. Also include the total numbers from project outreach and education activities, such as number of people reached, educational materials distributed, workshop participants, etc.

- **Long-term results:**
  - Do the results of this project build capacity that can increase the likelihood of long-term outcomes, such as:
    - environmental problems identified or understood
    - land use changes in the watershed
    - recommendations created
    - consensus for action created
    - increased ability to solve similar problems in the future, etc.?
    - if so, how?
  - Did you form new partnerships or alliances as a result of the project? If so,
    - What longer-term impact will this have on the project?
    - What future efforts are anticipated as a result of the partnership(s)?
    - Describe any activities you are aware of by others that benefited from the results of your project and/or resulted in implementation of similar projects in other locations.
  - Is there a plan to continue the project beyond the end date of the grant agreement or contract? If so, explain.
  - Describe how you shared the results of your project. List any information or technology transfer and dissemination (newsletters, web sites, training, reports, disseminated project activities, accomplishments, and lessons to the general public). Where and to what audiences have you made presentations?
  - What other audiences (media, businesses, other agencies, etc.) would be most interested in the results of this project?
  - Please describe any lessons learned during this project that would be valuable for future projects, even if the project didn't succeed as expected. What other recommendations or advice would you make for future activities related to this priority project area?
  - Please provide any feedback or suggestions that you would like to share with the MPCA to improve their grant programs.

Section III – Final Expenditures

Projects should use the format they used in their work plan for the budget to report on the final expenditures. This should list the tasks or activities outlined in their original (or amended) work plan.

Please complete this grant project summary and copy/paste into your final report.

Grant Project Summary

Project title: Little Cottonwood River Watershed Project

Organization (Grantee): Brown Nicollet Cottonwood Water Quality Joint Powers Board

Project start date: March,15 2001 Project end date: June 30, 2008 Report submittal date: June 30, 2008

Grantee contact name: Karen Swenson Title: Administrator

Address: 322 S. MN Ave.

City: St. Peter State: MN Zip: 56082

Phone number: 507-934-4140 Fax: 507-934-8958 E-mail: swenbneh@hickorytech.net

Basin (Red, Minnesota, St. Croix, etc.): Minnesota County: Brown, Cottonwood, Blue Earth

Project type (check one):

- ☐ Clean Water Partnership (CWP) Diagnostic
- ☒ CWP Implementation
- ☐ Total Maximum Daily Load (TMDL) Development
- ☐ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL Implementation

Grant Funding

Final grant amount: $157,695.24 Final total project costs: $322,652.82

Matching funds: Final cash: $0 Final in-kind: 164,957.58 Final Loan: $105,100.67

Contract Number: A65733 MPCA project manager: Lee Ganske (2001-2007)/Scott MacLean (2008)

For TMDL Development or TMDL Implementation Projects only

Impaired reach name(s):

AUID or DNR Lake ID(s):

Listed pollutant(s):

303(d) List scheduled start date: Scheduled completion date:

AUID = Assessment Unit ID
DNR = Minnesota Department of Natural Resources

Executive Summary of Project (300 words or less)

This summary will help us prepare the Watershed Achievements Report to the Environmental Protection Agency. (Include any specific project history, purpose, and timeline.)

The Little Cottonwood River Watershed is a long narrow area spanning three counties and covering 170 sq. miles in South Central Minnesota. The watershed is part of the Middle Minnesota Major Watershed within the Minnesota River Basin. Nearly 90% of the watershed is comprised of row-crop cultivation.

A Phase I diagnostic study (1997-2000) indicated reductions in non-point sources of sediment, nutrients and pathogens throughout the watershed would contribute to improvements to the main stem of the Little Cottonwood and Minnesota River. In addition to water quality impairments, increased flooding frequency was found to be the biggest water resource issue for watershed residents. The technical committee identified several actions which would help lower non-point sources of pollution in the watershed while concurrently reduce the impacts associated with flooding.

In 2001, the Brown Nicollet Cottonwood Water Quality Joint Powers Board was successfully awarded a Phase II Clean Water Partnership Implementation Grant to help address water quality impairments within the watershed. The purpose of the Little Cottonwood River Clean Water Partnership was to protect and enhance water quality by helping accelerate the voluntary adoption of conservation practices within targeted areas of the watershed. Three primary goals were established for the six year project (2001-2007):

1. Establish 1,500 acres of permanent conservation easements within the 100 Year floodplain to address flooding and water quality issues.
2. Increase the enrollment of conservation buffers and small wetlands along the main-stem of the Little Cottonwood River and tributaries.
3. Achieve a sediment load reduction of 25%, phosphorus reduction of 30%, and a reversal of increasing nitrate levels, and pathogens such as E. coli bacteria.

Project staff utilized a variety of financial, technical and educational initiatives to help accomplish these aggressive goals, with major emphasis placed on providing additional staff to promote and deliver already existing conservation programs. Two positions were created to help facilitate the adoption of conservation practices, a Technical Service Representative and a Conservation Liaison. This approach proved to be a successful management technique. These positions were instrumental in leveraging the skills of conservation partners, new and existing conservation programs and ultimately increasing conservation adoption rates.

By the end of the project in 2007, a total of 2,835 acres of permanent conservation easements were enrolled in the Conservation Reserve Enhancement Program (CREP). A total of 1,275 acres (45%) of the easements were located within the 100-year floodplain. The remaining acres were associated with riparian buffers and restored wetlands. In addition, project staff helped promote and deliver Continuous

Conservation Reserve Program (CRP) filter strip and wetland restoration practices. An additional 700 acres were installed in the watershed as a result of this effort.

Installing riparian buffers along environmentally sensitive cropland was a very high priority during the project implementation phase**.** It is estimated that prior to the adoption of project related CREP and CRP, about 43 miles (27%) of the LCR main stem and its tributaries were buffered. Through the combined efforts of the watershed project and its partners, the amount of buffers in the watershed increased substantially. Remarkably, 103 miles or 65% of the riparian corridors within the watershed are adequately buffered from cropland practices. This represents an additional 60 miles (140% increase) of buffers within the watershed in less than six years. By 2007, the project and its partners ultimately helped accelerate the adoption of an additional 3,535 acres of new conservation practices within the watershed (74% increase).

In effort to help reduce trends associated with E. coli concentrations, 37 septic systems were upgraded utilizing special loans provided by the watershed project. This increased the level of compliant septic systems from 24% to 32%. Several other activities were completed including the installation of a milk house wastewater treatment system, installation of grassed waterways and the replacement of 41 open intakes. Numerous educational outreach materials and initiatives were also conducted to help educate watershed residents and partners. An analysis of the sediment and nutrient loads (1998-2007) was conducted to determine if any reductions could be associated with the increased adoption of conservation by watershed landowners. The pollutant loads were separated into a '*before'* period (1998-2004) and an '*after'* period (2005-2007) The period after 2004 was selected since it was felt that all CREP and CCRP acres that were associated with the watershed project were installed after that point.

In general, it appears that there are some positive indications that sediment loads are decreasing (-11%), but phosphorus (+23%) and nitrate nutrient loads (+63%) are increasing. Increasing nitrate trends appear to be particularly strong. It should be emphasized that these conclusions are limited with respect to post treatment load data. Therefore, continued long term monitoring, analysis, and watershed computer model simulations will be imperative to validate any of these perceived observations.

It may be too early to accurately assess whether there are any watershed scale, water quality improvements resulting from the project, though it did clearly demonstrate the importance of people. The project demonstrated that it takes people devoted to the promotion, outreach, and nurturing of personal relationships with landowners and project partners to achieve significant conservation adoption achievements.

Goals (Include three primary goals for this project.)

1st	Goal:	Establish 1,500 acres of permanent conservation easements (CREP) within the 100-year floodplain to address water quality and quantity issues
2nd	Goal:	Increase the adoption of conservation buffers and wetlands along the main stem of the Little Cottonwood and its tributaries
3rd	Goal:	Achieve a sediment load reduction of 25%, phosphorus 30% and a reversal of increasing nitrate levels and pathogens such as E. coli bacteria.

Results that count (Include the results from your established goals.)

1st	Result:	2,835 acres of CREP, of which 45% was located within the floodplain
2nd	Result:	About 1,500 acres of additional wetlands and 60 more additional miles of buffers
3rd	Result:	11% decrease in sediment, nutrient levels appear to continue an increasing trend, nitrate especially. (23% and 61% respectively.

Picture (Attach at least one picture, do not imbed into this document.)

Description/location:

CREP easement site located along the main stem of the Little Cottonwood River. Landowner is explaining the reasons why he enrolled the 15-acre field into the program.

Acronyms (Name all project acronyms and their meanings.)

- Clean Water Partnership (CWP)
- Conservation Reserve Enhancement Program (CREP)
- Conservation Reserve Program (CRP)

Partnerships (Name all partners and indicate relationship to project)

- Blue Earth Consulting
- Brown County Planning and Zoning
- Brown County Water Planning
- Brown County Soil and Water Conservation District
- Board of Water and Soil Resources
- Brown Nicollet Environmental Health
- Cottonwood County Environmental Services
- Cottonwood County Soil and Water Conservation District
- Farm Service Agency
- Gustavus Adolphus College and Interns
- Minnesota Department of Agriculture
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Natural Resources Conservation Service

USDA United States Department of Agriculture

Fact Sheet *April 2008*

Minnesota CRP-SAFE Practices; CP38E—Back Forty Pheasant Habitat

Overview

The State Acres For wildlife Enhancement (SAFE) initiative is designed to address state and regional high-priority wildlife objectives under the Conservation Reserve Program (CRP).

The CP38E—Back Forty Pheasant Habitat is a continuous CRP conservation practice available in Minnesota through SAFE. The proposal was developed by Pheasants Forever of Minnesota and the Minnesota Prairie Chicken Society, in partnership with FSA, NRCS, DNR, BWSR, MASWCD, DU, USFWS and The Nature Conservancy.

23,100 acres have been allocated to Minnesota for enrollment beginning April 14, 2008.

Purpose

The Back Forty Pheasant Habitat practice serves to restore pheasant and prairie chicken habitat by establishing small blocks of grassland (10-40 acres) and enhancing existing habitats (up to 10 acres); several grassland dependent birds that are in severe decline will also benefit.

Available CP38E Practices

CP38E offers may include a combination of up to four CP38E practices at the participant's option and depending on practice acreage location as follows:

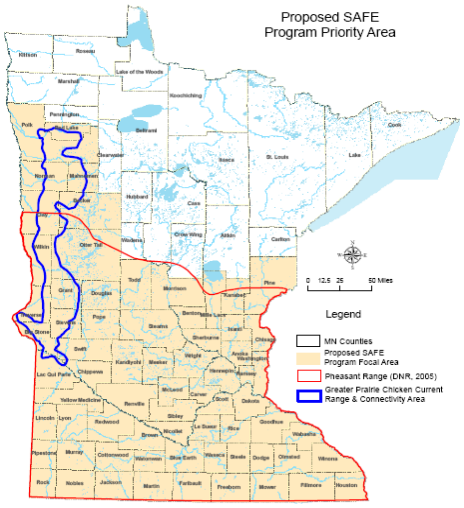
CP38E—Rare & Declining Habitat practice, must comprise at least 75 percent of the grassland acreage within an offer and conform to NRCS Standard 643 specifications, which establishes native species on the land.

CP38E—Introduced Grasses practice may comprise up to 25 percent of the grassland acreage in an offer, which is seeded to select introduced grasses and legumes to provide a mosaic of grassland types in the landscape.

CP38E—Wildlife Habitat practice may be included in an offer where there is no adequate existing winter cover within 2 miles of the practice acreage.

CP38E—Wildlife Food Plot practice may be included in an offer where adequate winter cover is available within 1/4 mile of the practice acreage.

Introduced Grasses, Wildlife Habitat and Wildlife Food Plot practices must be established according to NRCS Standard 645, as adjusted for the CP38E.



Quality Habitat Area

Offered acreage must lie within counties included in the designated SAFE area (MN Pheasant and Prairie Chicken Range):

Operation and Maintenance

Noxious weeds and other undesirable plants, insects, and pests shall be controlled, including such maintenance as necessary to avoid an adverse impact on surrounding lands.

Mid-contract management is required, and will be site-specific as determined by NRCS in the conservation plan.

Contract Period

The proposed CRP contract period will be 10 to 15 years. The effective date of the contract is the first day of the month following the month of approval; however, participants may defer the effective date up to 6 months.

Participant Eligibility Criteria

To be eligible for enrollment, a participant must have owned or operated the land for at least 12 months prior to submitting the offer, with certain exceptions evaluated by FSA on a case-by-case basis.

Continues ‣

Land Eligibility Criteria

Offered land must be:

- Cropland that meets current CRP cropping history requirements;
- Physically & legally capable of being planted to an agricultural commodity in a normal manner (pastureland is **not** eligible); and
- Physically located within the designated SAFE area
- Otherwise eligible.

Practice Requirements

CP38E offers may be:

- 10 to 40-acre blocks within a tract or adjacent tracts, including adjacent tracts of different ownership;
- Small fields (<10 acres) adjacent to existing habitat that collectively form a minimum of 10 acres of habitat;
- Center-pivot irrigation corners (<40 acres); or
- Cropland-ravine interface areas (<40 acres)

Payments

Annual Rent

In return for establishing long-term, resource-conserving covers, FSA provides annual rental payments to participants. FSA bases rental rates on the relative productivity of the soils within each county and the average dry land cash rent or cash rent equivalent. In addition, a maintenance rate is added to the annual rental rate and the maximum per-acre annual rental rate is calculated in advance of enrollment.

Cost-share Assistance

FSA provides cost-share assistance to participants who establish approved cover on eligible cropland. The cost-share assistance can be no more than 50 percent of the participant's cost to establish approved practices.

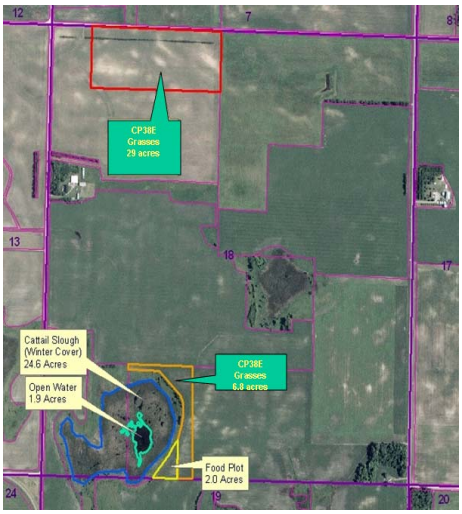
Additional Financial Incentives

In addition to the annual rental payment and cost-share, FSA offers eligible participants the following incentives:

- A one-time signing incentive payment (SIP) of $100 per acre for each SIP-eligible acre enrolled; the SIP will be issued after the contract is approved and all payment eligibility criteria are met; and
- A one-time practice incentive payment (PIP) equal to 40 percent of the eligible installation costs for PIP-eligible acres enrolled; the PIP will be issued after the practice is installed, eligible costs are verified, and other payment eligibility criteria are met.

Examples of Eligible Acres

CP38E Practices:



Irrigation Corners:

Cropland-Ravine Interface:

For more information on SAFE sign-up, contact your local FSA office.

www.fsa.usda.gov/mn

Take advantage NOW and save $700 or more on a septic upgrade!

Why Upgrade Your System?

1) Groundwater and surface water can be contaminated by a failing system.

2) It's the Law and it's the right thing to do.

3) Help keep your watershed and Little Cottonwood River clean.

4) It is required that your septic system be up to code when adding a bedroom.

5) Septic system inspection at point of sale has been required since January 1, 1998.

6) If your system is hooked into a tile line or drains to the surface, you could be **fined $500 every month** if it is not upgraded within the 10 month period given on the notice of non-compliance. (*New MN law as of Aug. 1, 2006)

WaterShed

Little Cottonwood River Watershed Project
322 S. Minn. Ave.
St. Peter MN, 56082
507-934-4140

Is your septic system up to code?

If you are a homeowner in the Little Cottonwood River Watershed and believe that your septic system needs to be upgraded, contact the Brown County Planning and Zoning Office to learn more about a special low-interest loan program.

Save $700 or more!

Telephone

507-233-6640

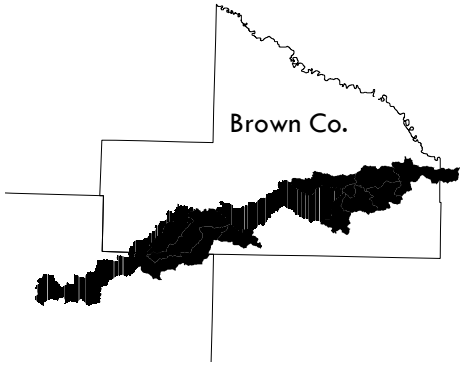
Does my septic system need to be upgraded?

If sewage from your house:

- ⇒ Goes into a field drainage tile;
- ⇒ Goes out of a pipe into a river, creek, pond, wetland, drainage ditch, lake, slough, or a ravine;
- ⇒ Goes out of a pipe onto the surface of the ground;
- ⇒ Goes into a cesspool, drywell, or seepage pit;
- ⇒ If you never needed to pump your septic tank and have never had any trouble with your system;

If you answered YES to any of these questions you are legally obligated to repair, upgrade, or replace your septic system.

Little Cottonwood Watershed homeowners are eligible for special low interest financing to upgrade their non-complying septic system. *NOTE these funds are limited and will not be available after 2007.



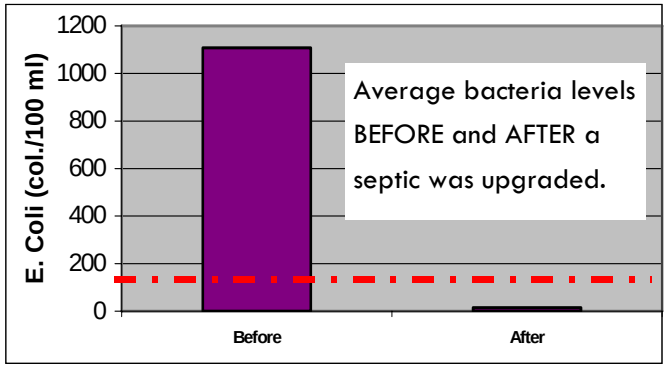
Little Cottonwood River Watershed

EXAMPLE for an $8,000.00 Loan	*Conventional Financing*	*Watershed Septic Loan*
Loan Amount	$8,000.00	$8,000.00
Interest Rate	6.75%	3.5%
Loan Length	5 Years	5 Years
Monthly Loan Payment	$157.47	$145.53
Total Interest Paid	$1,448.06	$732.04
Total Interest Savings:	$716.02 or $11.94/month	

Conventional vs. Watershed Septic Loan Program

You can make a difference!

The chart below depicts *actual* before and after bacteria testing of a drainage tile outlet at a public drainage ditch in a local watershed. The tile was hooked directly to a home 1/4 mile away with a non-complying septic. The septic was upgraded in May of 2006. Over a 98% reduction! (*Levels above 126 col./100ml are considered a public health threat for the Little Cottonwood River)



Simple steps to upgrade your septic system:

1) Pick up a loan application at the P/Z Office and verify you are in the Little Cottonwood Watershed. (507-233-6640)

2) If you qualify, contact a licensed septic contractor to get a design and estimate.

3) After you have a design and estimate, contact the P/Z Office to schedule a time to process the loan application.

- ⇒ A one-time application fee of $150 will be collected up-front.
- ⇒ The loan amount payback period in Brown County is 5 years.

Funds are limited so act now!

- ⇒ About 75% of the 411 homes in the watershed could benefit from this special financing program.
- ⇒ Since 2002, over 30 homeowners have used the special financing.

Brown County Planning and Zoning Office
Brown County Courthouse
P.O. Box 248
New Ulm, MN 56073-0248
507-233-6640

Brown County Conservation Tour

Thursday, June 17, 2004

Welcome to this year's Conservation Tour. The purpose of this tour is to give policy makers a first hand view of recent conservation efforts to help protect and enhance soil and water quality. This tour will consist of about 10 stops ranging from a dairy farm to recently restored wetlands and prairies. Thanks for attending and enjoy the tour.

BROWN

SOIL and WATER CONSERVATION DISTRICT

BNC Water Quality Board

Sponsored by:

BNC Water Quality Board-Little Cottonwood River Clean Water Partnership

Brown County Soil and Water Conservation District

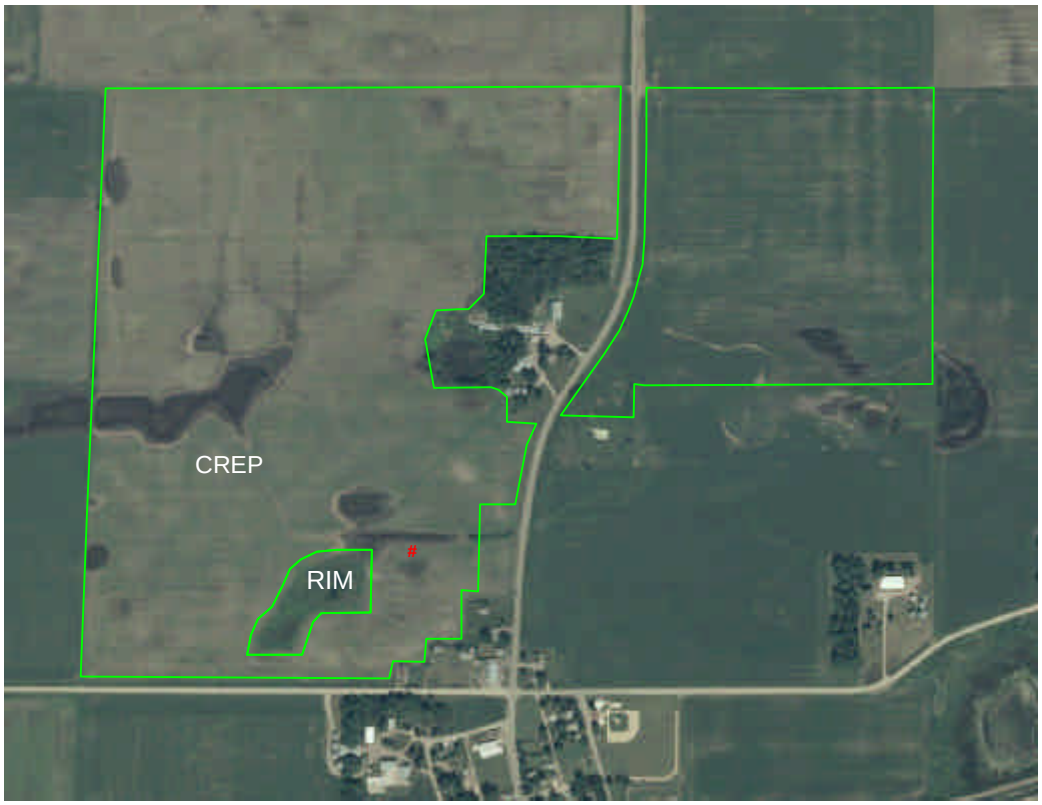
Brown County Natural Resources Conservation Service

Brown County Farm Services Agency

Stop 1A

Verne Radloff CREP Wetland Restoration

Time permitting, we will stop at this wetland restoration site on our way to New Ulm. This site was enrolled into the state's Conservation Reserve Enhancement Program (CREP) in 2002. The site is located in Milford Township, Section 18. About 146 acres were enrolled into the program. Three acres were already enrolled into the Reinvest in Minnesota Program (RIM). Seeding of native warm season grasses was completed in the fall of 2002 and the wetland restoration was completed in May of 2004. Wetland areas are expected to store about 25 acre-feet of water.



Cost-Share Assistance		**Before**	**After**	**Total Saved/Year**
• State CREP program	Soil Conservation			
	Soil Loss	2 tons/acre	< 1 ton/acre	146 tons
Technical Assistance	Water Conservation			
• Brown SWCD	Nitrate	22 lbs./acre	2 lbs./acre	2,920 lbs
• Brown NRCS	Phosphorus			33 lbs.
• BWSR				

Stop 3

Steve and Kerry Hoffman Dairy Farm- Lime Flocculator Treatment

The newly revised Minnesota Feedlot Rules (7020) clarify requirements for properly treating and handling milkhouse wastes to prevent water pollution. As part of this water quality project, a state of the art milk house wastewater treatment system (flocculator) was installed on the Steve and Kerry Hoffman Dairy Farm in Cottonwood Township Section 21 to treat water pollutants before being discharged into the Little Cottonwood River. Water tests from the milkhouse wastewater treatment system have shown 82% or greater removal of pollutants.

How it works: Lime flocculator treatment of milkhouse water was adapted from the wastewater treatment industry. First, wastewater from the washing process is pumped into a tank, where a flocculent is added to concentrate the pollutants into a sludge that can be separated from the liquids. Lime is then added to help neutralize the pH. About two pounds of lime are added to 185 gallons of wastewater, mixed for about 20 minutes, and allowed to settle for two hours. In the second step, the solid materials are disposed of with the manure or used as a soil amendment. The liquid portion is sent to an infiltration field under the ground for final treatment.

Total Cost = $20,000

Cost-Share Assistance
- EQIP (50%)
- LCR Watershed Clean Water Partnership (25%)

Technical Assistance
- Brown NRCS
- Brown SWCD
- St. Peter Area NRCS
- PremierTech

	Before	After	% Removal
Water Conservation			
BOD	1191 mg/l	213 mg/l	82 %
Solids	390 mg/l	17 mg/l	96%
Phosphorus	52 mg/l	1 mg/l	98%

Stop 4

Ron Olson CREP Wetland Restorations

At stop 4 we will visit the Ron Olson Farm. This was one of the first wetland restorations through CREP in Brown County. The CREP easement consists of 103 acres and was last cropped in 1999. A sheet pile weir is used on the western boundary to control the water level. Several dikes and emergency spillways were also constructed to manage water levels. Water storage at this site is estimated to be about 30 acre-feet of water or about 10 million U.S. gallons at full capacity.

Cost-Share Assistance		Before	After	Total Saved/Year
• State CREP program	Soil Conservation			
	Soil Loss	2.5 tons/acre	< 1 ton/acre	155 tons
Technical Assistance				
• Brown SWCD	Water Conservation			
• Brown NRCS	Nitrate	22 lbs./acre	2 lbs./acre	2,060 lbs
• BWSR	Phosphorus			35 lbs

Stop 6 and 7

Aspelund Farm- -Rock Inlet, and CRP Filter Strip

After lunch, we will briefly stop to view a few examples of soil conservation practices in the Lake Hanska watershed. Special emphasis has been placed within this watershed to help protect and enhance the 1,800-acre lake. We will look at two practices that have been popular within the watershed: rock inlets and filter strips. At this site two open tile intakes were replaced with rock inlets in the year 2000. When compared to open tile intakes, rock inlets deliver up to 40% less sediment and particulate phosphorus. In 2002, a 40-foot filter strip through the Continuous CRP program was also installed along Judicial Ditch 5. A total of 145 acres of cropland has been enrolled into the CRP filter strip program within the watershed. An astounding 47% (15 of 32 miles) of the eligible cropland has a filter strip along a drainage ditch within this watershed.

Cost-Share Assistance
- Lake Hanska Watershed Project
- NRCS
- BWSR Challenge Grant

Technical and Admin. Assistance
- Brown SWCD
- Brown NRCS
- Brown FSA
- BNC WQ BRD

	Before	After	Total Saved/Year
40 feet of Filter Strip			
Soil Conservation			
Soil Loss	1.5 tons/acre	0.7 ton/acre	12 tons
Water Conservation			
Phosphorus			18 lbs
2 Rock Inlets			
Soil Conservation	1.5 tons/acre	0.25 tons/acre	0.5 tons
Water Conservation			
Phosphorus			0.75 pounds

Lakeshore Protection

The next stop will be a shoreline protection project that was recently completed along the south boat access to Lake Hanska. About 650 feet of shoreline was protected using sioux quartzite riprap at a cost of $23,000, or about $35/linear foot. Funding was utilized from various sources including the Watonwan Watershed Clean Water Partnership, Brown SWCD, Albin Township and DNR.

Total Cost = $23,000

Cost-Share Assistance
- Watonwan CWP 51%
- Brown SWCD 22%
- Albin Township 25%
- MN DNR 2%

Technical Assistance
- Brown NRCS
- Brown SWCD

Stop 9

Gary Rathman Prairie Restorations

This site is unique because it is one of the largest and most diverse private prairie restorations in the area. In a typical restoration about 10-20 native grass species and forbs are planted. However, at this site over 400 species have been planted.

Gary Rathman, landowner in Mulligan Township, enrolled some of his land into the CREP program to increase the bio-diversity on his farm through a prairie restoration. When it comes to prairie restoration and wildflowers Gary Rathman has done his homework. "I wanted to restore what was once on my land," states Gary. "I felt the CREP program was intended to help restore what was once part of the original landscape. In the case of my land it was prairie." In just one year Gary has turned part of his farm from a corn/soybean field into a very diverse ecosystem. Through the help of Tom, Kathy, and Greg of the SWCD/NRCS, the DNR, prairie seed dealers, and some studying Gary enrolled part of his farm into the CREP program. On other acres he has enrolled his land into the CRP program.

Cost-Share Assistance
- CREP
- CRP

Technical and Admin. Assistance
- Brown SWCD
- Brown NRCS
- Brown FSA
- MDNR

	Before	**After**	**Total Saved/Year**
Soil Conservation			
Soil Loss	4 tons/acre	< 1 ton/acre	1950 tons
Water Conservation			
Nitrate	22 lbs./acre	2 lbs./acre	13,000 lbs
Phosphorus			440 lbs

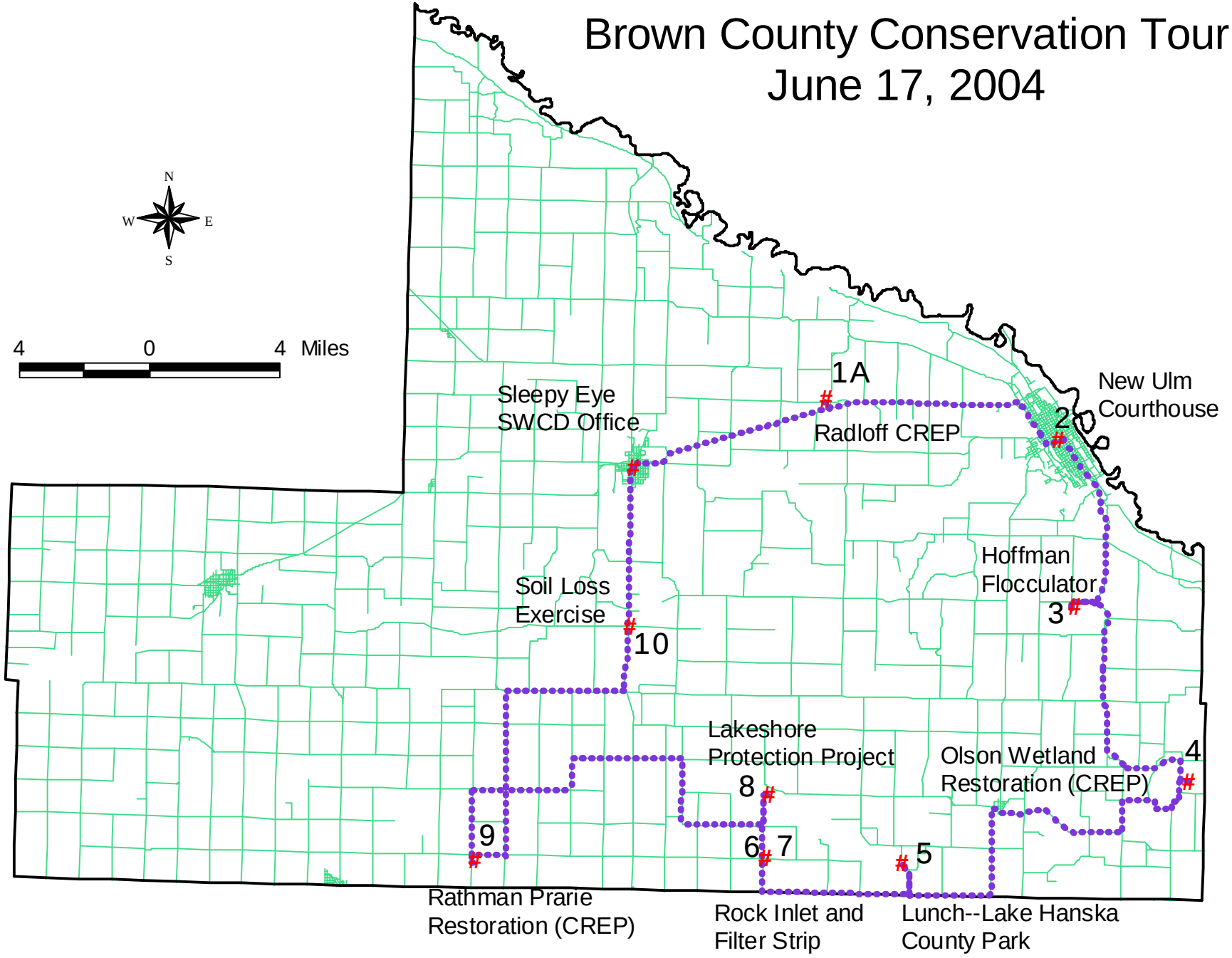
Soil Erosion Exercise

Time permitting we will stop at this site on our way back to Sleepy Eye. Most Brown County soils begin to lose their ability to support plants when they erode more than 5 tons of soil per acre each year. This usually occurs through a process called sheet erosion, the gradual wearing away of a thin layer or "sheet" of soil. Since about 5 tons of soil lost per acre equals the thickness of a dime (1mm), sheet erosion can be very hard to see. Site 10 is an example where the tolerable soil loss has been exceeded.

This 10-acre field was in CRP just a few years ago and also contained large grassed waterways to help protect the field from erosion. The hillside is highly erodible and consists of Dickinson sandy loams at 2-6% slopes and Storden-Clarion Loams at 12-18% slopes. This site has since been converted from CRP to cropland, and the grassed waterways removed. The current crop management system on these slopes will produce on average about 21 tons/acre of soil loss per year. The soil loss seen in this picture after recent heavy rains is estimated to be more like 50-60 tons/acre. In addition, this field is within 300 feet of a stream. Assuming about 80% of the soil erosion is delivered to the stream it is estimated that 17 tons/acre/year or a total of 170 tons of soil and 255 pounds of phosphorus could be delivered to the Cottonwood River from this site alone. Erosion at this rate greatly reduces the sustainability of the soil to produce crops, degrades soil and water quality, and can also result in expensive ditch and culvert maintenance. The table below shows potential reductions as a result of implementing BMPs like conservation tillage or grass cover.

	Potential Total Saved/Year
Conservation Tillage	Reduced from 21 tons to 10 tons (52% reduction)
CRP	Reduced from 21 tons to 2 tons (90% reduction)

Brown County Conservation Tour
June 17, 2004



Did you know?

In Brown County there are:

- 326,135 acres of cropland
- 14,545 acres or 4.4% of the cropland is now under some kind of conservation easement. 56% of the easements are temporary and 44% are perpetual.
    - 1,081 acres in RIM
    - 541 acres in WRP
    - 4,756 acres of CREP
    - 2,032 acres of CRP filter strips
    - 279 acres of CRP Farmable Wetlands

Little Cottonwood River Watershed

- The watershed is 108,757 acres of which 96,670 or 89% is cultivated.

- 5,192 acres are under a conservation easement. This represents 5.4 % of the eligible cropland.

- Flooding has been the main concern within this watershed. In 2000 efforts began to help accelerate the adoption of conservation programs by providing additional cost-share and technical assistance through the Clean Water Partnership Program.

- One of the main programs emphasized in this watershed was the CREP program within the 100-year floodplain.

- A total of 2,321 acres of marginal or environmentally sensitive land was enrolled into CREP. This accounts for 2.4 % of the cultivated land in the watershed.

- About 54% or 1,253 acres of the CREP easements are located within the 100-year active floodplain of the Little Cottonwood River. On the remaining land, 1,068 acres of easements are located on frequently flooded soils (wetlands) or along riparian corridors like streams and drainage ditches.

- Currently, special efforts have been focused on the CRP filter strip and farmable wetlands program.
    - A total of 651 acres of cropland have been enrolled into the CRP filter strip program and a total of 34 acres have been enrolled into the FWP program.
    - 153 miles of 397 miles or 40% of the eligible streams in the watershed are adequately buffered.

Children's Water Festival

The annual Children's Water Festival is a one-day event, heightening the awareness and importance of our most valuable resource — water. Each year about 1,000 fourth graders from Brown, Nicollet and Cottonwood Counties have the opportunity to participate in a fun-filled day of water-related activities at a Children's Water Festival. The day is filled with hands-on activities, an exhibit hall, and entertainment.

Water Festivals have become an enormous success in Minnesota and around the country. The first water festival was sponsored by the Nebraska Groundwater Foundation in Grand Island in 1989. The BNC Water Quality Board held it's first festival in 1999, and has sponsored one each year since that time.

The annual Children's Water Festival is a one-day event, heightening the awareness of the importance of our most valuable resource — water. Approximately **1,000** fourth graders from Brown, Nicollet and Cottonwood Counties participate each year. Various aspects of water-related topics are taught through presentations, experiments, exhibits, games and entertainment.

Teachers appreciate the opportunity to bring their students to one location where many experts are available. They like the hands-on learning and field day atmosphere, and it allows teachers to obtain the most current information about water resources to take back to their classrooms.

Students have fun learning about water and are exposed to adult role models in water-related and environmental fields of employment and volunteerism.

The Water Festival is held each March at the South Central Technical College Campus in North Mankato and is led by a volunteer steering committee and many other support committees.

This ambitious event could not happen without the support and assistance of many dedicated professionals and volunteers from education, government, associations and businesses. They have contributed the time, money, goods and services needed to make the Water Festival possible.

Examples of Classroom Sessions for Students

Bill Thompson, Minnesota Pollution Control Agency, demonstrates how a stream might erode its banks or change its course due to obstructions like boulders or trees.

Carol Hubbard of the Minnesota Pollution Control Agency, and her pal, Clancy the Mercury Sniffing Dog, after a long day of showing the students how they protect the environment by finding sources of potentially harmful mercury.

Students examine a watershed model (enviroscape) that demonstrates how different types of land use can impact water quality and ways to protect it.

Children's Water Festival Mission

Provide youth and classroom teachers with an innovative, quality, hands-on learning opportunity highlighting the relationship and interdependence of water to all living things. The major water issues addressed include health, recreation, nature, science, weather and land stewardship.

For more information, contact Brown Nicollet Environmental Health at 507-934-4140

Filter Strips: Priceless

33' filter strip along a drainage ditch in rural Nicollet

Landowners are likely to finance filter strips with cost share programs, not credit cards, but like those credit card commercials say, the benefits are priceless. Not only do filter strips protect water quality by trapping soil particles, nutrients, and pesticides, they can also improve water infiltration and enhance wildlife habitat.

The recommended vegetation and dimensions (33'-120') vary depending on soils, land uses, and surface water runoff, but filter strips all have the same basic function. Ideally, water runoff spreads out and flows as a thin "sheet" across the filter strip. Vegetation slows the runoff enough to let some suspended soil particles, plant debris, and other contaminants settle out. This reduces sedimentation in streams. Trapping sediments in filter strips can be especially beneficial in streams that provide subsurface drainage outlets, as it can help reduce sediment removal costs associated with drainage maintenance. Some plant nutrients, such as phosphorus and the ammonium form of nitrogen, bind to soil sediment, so trapping the sediment also traps those nutrients. Certain pesticides are also trapped with soil particles. In the filter strip, those pesticides break down and the nutrients fertilize the vegetation rather than disrupting the balance of life in the water downstream.

Filter strips provide a safety setback

Another advantage is that water moving slowly through a filter strip has more time to soak in instead of running off and adding to surface flow. The ground in a filter strip is often more permeable than crop ground, so water soaks in faster, too.

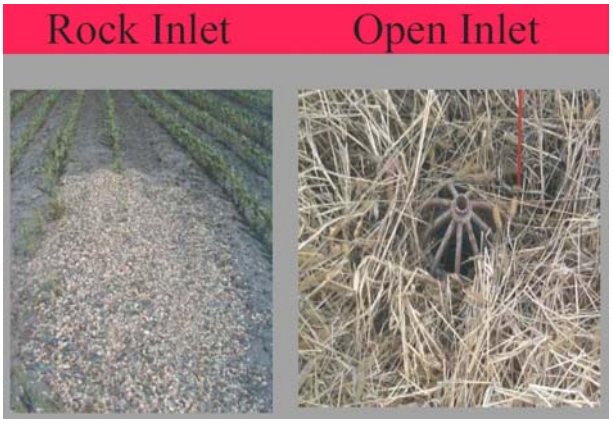
Filter strips offer a variety of other benefits. The setback afforded by filter strips generally assures that less drift from spray and manure applications will reach ditches or streams. This setback also provides a greater measure of safety to farm operators, as machinery can't operate as close to potentially hazardous stream or ditch banks.

Although filter strips usually aren't installed primarily to benefit wildlife, the vegetation provides food and cover that is especially attractive to songbirds and small mammals. The strips can also become travel corridors so wildlife can move from one area of habitat to another without the risk of crossing open fields.

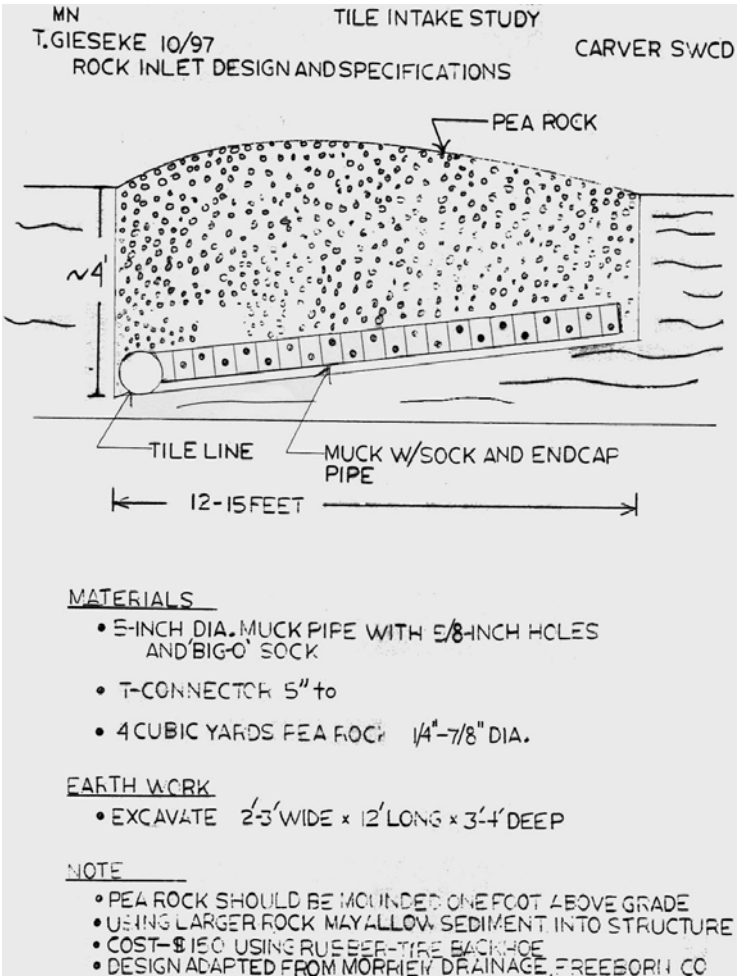
Researchers have measured the advantages of filter strips with small-scale studies on individual fields and small watersheds. But showing the benefits in larger watersheds is still a challenge. Even if a filter strip makes a dramatic difference in the quality of water leaving a particular field, the benefit can be hard to measure in water from the whole watershed. That's why it's so important for landowners throughout a watershed to install filter strips.

Ask about how filter strips can increase your eligibility for the Conservation Security Program (CSP). Contact the Nicollet Farm Service Agency office at 507-931-2550 or Farm Bill Assistance Representative at 507-934-4140 for more information.

Rock Inlet Provides Practical Alternative to Open Intakes



- **Water Quality:** Recent research shows that runoff, sediment, and associated contaminates to sub-surface tile lines can be reduced by 20-30% when an open intake is replaced with a rock filter. On average one rock inlet prevents around 400 lbs. of sediment and 0.5 lbs. of phosphorus from getting into tile lines per year.
- **Cost:** Open intake replacement costs range from $150-$300 per intake.
- **Drainage and Use:** Rock inlets have 10X the porosity of a 4" intake and are much easier to farm around compared to a standpipe or open intake structure. When combined with conservation tillage, they can last more than 10 years.



Contact the Nicollet NRCS/SWCD office at 507-931-2550 or 507-934-4140 for more information.

CREP

Minnesota River

Little Cottonwood River Watershed Project

Clean Water Partnership

Phase II Implementation

Interim Report

March 2001-March 2005

BNC Water Quality Board

April, 2005

Table of Contents

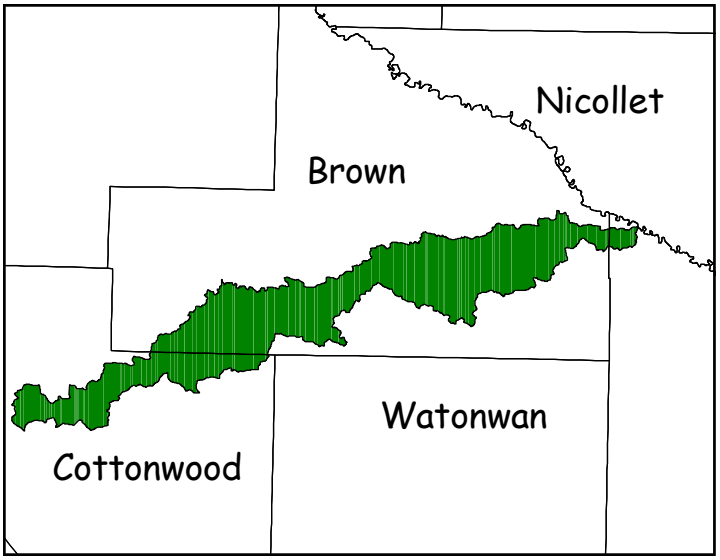
Tables

Maps

Introduction

This document serves as an interim report for a Phase II Clean Water Partnership granted to the Little Cottonwood River Watershed Project in March of 2001. This report identifies work plan objectives and initiatives accomplished from 2001 through 2005. A summary of the budget and respective expenditures by program element is included. Highlights of the Clean Water Partnership are also included. Although the original grant was set to expire in March of 2004, the project was granted an extension through 2005. The Brown, Nicollet, Cottonwood Water Quality Joint Powers Board is the coordinating organization for this project with major assistance and in-kind provided by NRCS, SWCD, MDNR, Water Planning and Farm Service Agency Offices.

Project Background



- In 1996 water quality monitoring began in the watershed and was funded though a Resource Investigation grant by the MPCA for the Middle Minnesota Major Watershed. Brown Nicollet Environmental Health helped fund this project.
- In 1997 a Phase I diagnostic study was undertaken through 2000. The study was delayed one year due to tornado damage throughout the watershed and project offices in March of 1998.
- In 2001 a Phase II CWP was awarded to the project and implementation of best management practices began.
- Special programs included land retirement of cropland within the 100-year floodplain through the Conservation Reserve Enhancement Program (CREP), low-interest loans for outdated septic systems, vegetated filter strips along drainage ditches, wetland restorations, nutrient management, on-farm nitrogen rate demonstrations, open-tile intake replacements, and feedlot upgrades.
- In 2004, the project was granted an extension into 2005.
- In late 2004, the project was awarded continuation funding through 2007.

Additional information relating to the watershed project or other similar projects can be found at http://mrbdc.mnsu.edu/org/bnc/ or contact Kevin Kuehner at 507-934-4140.

Project Overview

The Little Cottonwood River Watershed is a long narrow area spanning three counties and covering 108,757 acres or 170 sq. miles. It is apart of the Middle Minnesota Major Watershed of the Minnesota River Basin. Between 1989 and 1994, the upper reaches of the watershed were monitored as part of a groundwater study in Brown, Nicollet and Cottonwood Counties. Results indicated groundwater and surface water were connected and poor water quality from this river may have contributed to the groundwater issues in this area.

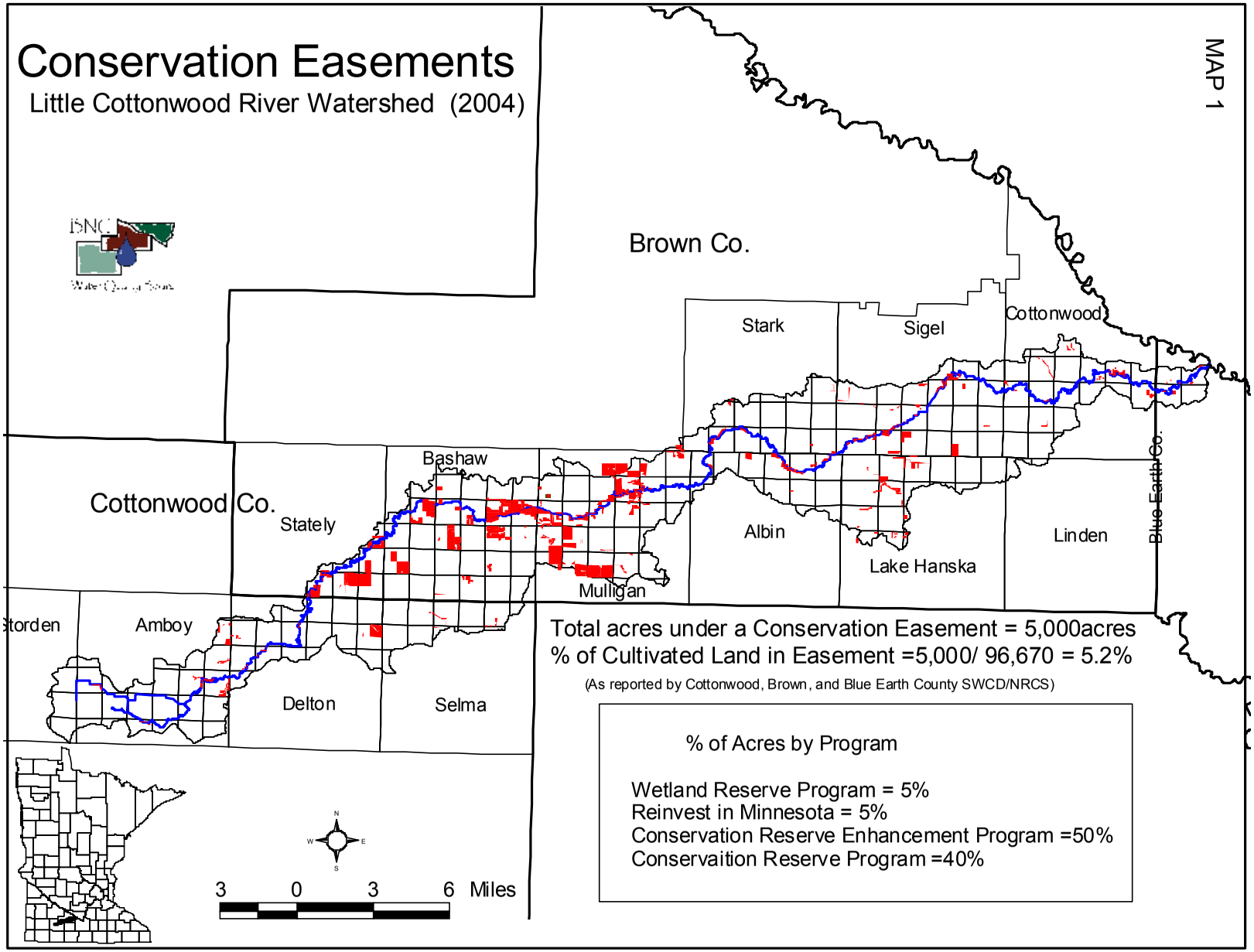
In the spring of 1996, monitoring began to intensify as part of a resource investigation project titled Middle/Lower Minnesota Assessment Project (MLAP). The main purpose was to identify which surface waters were negatively affecting the Minnesota River.

In 1997 a Clean Water Partnership (CWP) was created to further study the watershed and soon after four water quality monitoring stations were established in the watershed. Due to setbacks from a tornado, which struck parts of the watershed in the spring of 1998, the project was put on hold for one year. Results from the three-year study (1997-2000) indicated reduction in sediment, nitrate, and phosphorus throughout the watershed would contribute to improvements in the main stem of the Little Cottonwood and Minnesota River, (http://mrbdc.mnsu.edu/org/bnc/lc_report.html). In addition to water quality impairments, flooding was found to be the greatest concern by watershed residents. The technical committee identified several actions, which would help lower non-point sources of pollution in the watershed while at the same time remediate flooding concerns. In 2001 the project received funding from the CWP program to help accelerate the voluntary adoption of these recommended practices.

Land retirement of environmentally sensitive areas into CREP was one of the most successful initiatives during the Clean Water Partnership.

Implementation

In 2001, CWP funding was used to hire a full-time watershed technician to promote conservation easement programs in targeted areas. Two very popular programs that were used included the Conservation Reserve Enhancement Program (CREP) and the Conservation Reserve Program (CRP). Watershed assessments identified numerous areas where active floodplain was farmed increasing the potential nutrient and sediment loading to the river. It was estimated that over 4,500 acres of marginal agricultural land was eligible for the CREP program within the 100-year floodplain of the river. From 2001-2004, intensive marketing and technical administration


Conservation Easements
Little Cottonwood River Watershed (2004)
MAP 1
Brown Co.
Cottonwood Co.
Stark
Sigel
Cottonwood
Bashaw
Stately
Albin
Linden
Lake Hanska
Blue Earth Co.
Mulligan
Amboy
Delton
Selma
Total acres under a Conservation Easement = 5,000acres
% of Cultivated Land in Easement =5,000/ 96,670 = 5.2%
(As reported by Cottonwood, Brown, and Blue Earth County SWCD/NRCS)
% of Acres by Program
Wetland Reserve Program = 5%
Reinvest in Minnesota = 5%
Conservation Reserve Enhancement Program =50%
Conservaition Reserve Program =40%
3 0 3 6 Miles

by project staff to accelerate the enrollment of these environmentally sensitive areas into the CREP program began.

The outstanding success of this initiative is represented by Map 1 on the previous page. Map 1 shows the extent of conservation easements within the watershed. To date, there are over 5,000 acres of cropland enrolled into some type of conservation easement. Over half of those acres are CREP easements that were secured as a result of technical assistance brought forth by the CWP. A majority of those CREP acres are located within the 100 year floodplain and will significantly help reduce downstream water quality and flooding issues.

Gerald Riederer, farmer along the Little Cottonwood, explains the benefits of enrolling his land into the CREP program.

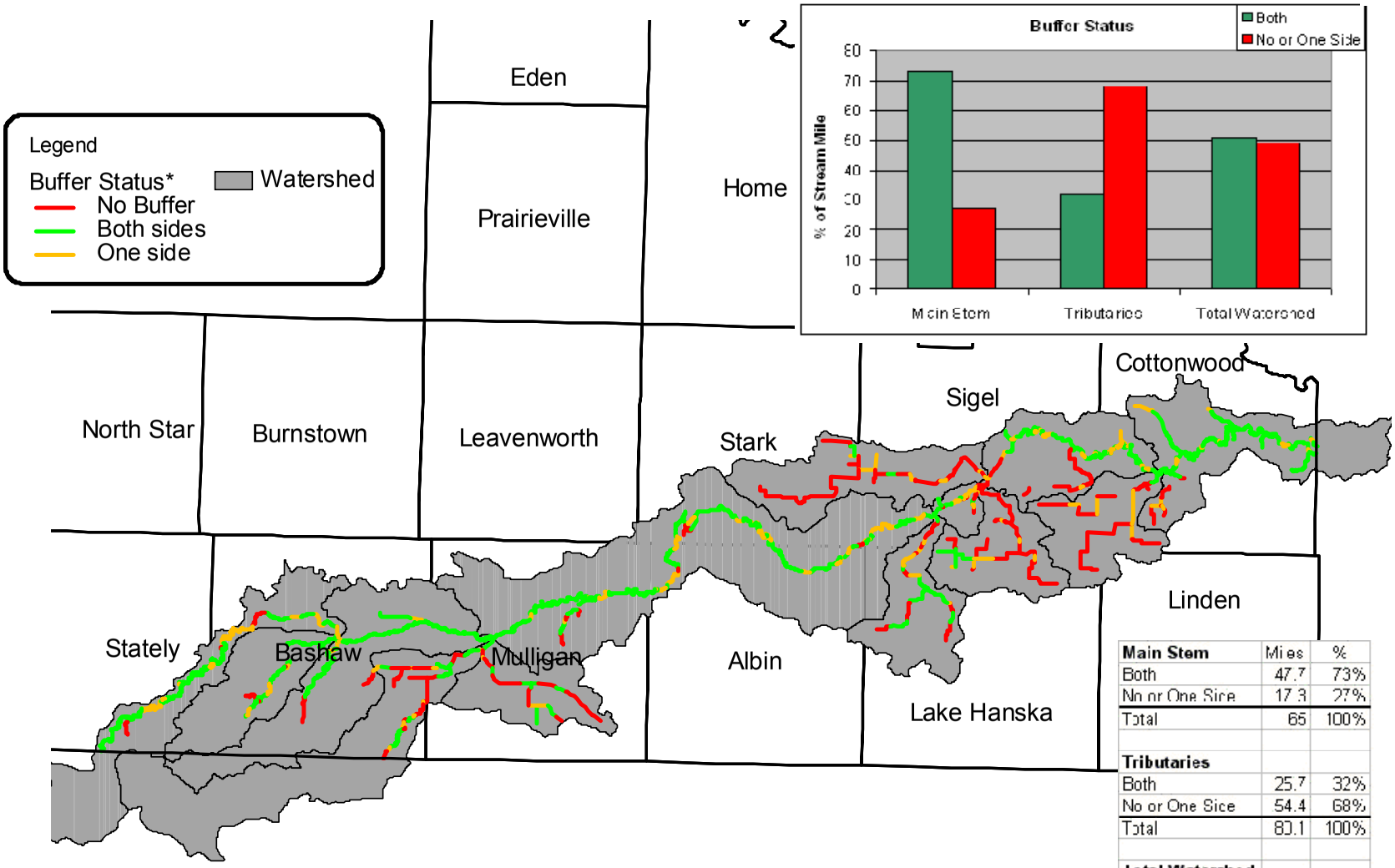
The direct marketing of the conservation programs to watershed landowners was organized into three phases. The first phase consisted of an initial letter to all county landowners advertising the program and staff working with it. The county mailing was then followed by a dollar per acre calculation using GIS digital ortho-photos, and soil maps. CREP proposals consisted of an air photo with the CREP eligible acres outlined and the respected amount of monetary compensation the landowner could receive if they enrolled the area into the program. The mailings went out to all eligible landowners in the watershed. The third phase consisted of phone calls and follow up visits to help answer any questions and facilitate the enrollment process. A significant portion of staff time and resources was devoted to this program element during the first two years of the CWP since the CREP program expired in September of 2002. After CREP expired, a similar technique was used to market and accelerate the adoption of Continuous Conservation Reserve Program practices.

Between CRP and CREP, over 4,000 acres have been enrolled by an estimated 150 landowners within the 170 square-mile watershed. This conserves an estimated 16,000 tons of soil, and helps prevent an estimated 4,500 pounds of phosphorus and 80,000 pounds of nitrates from entering the river each year.

After CREP expired in 2002, efforts switched to the Continuous CRP program and targeting acres along tributaries of the Little Cottonwood. Over 300 proposals were sent out to those landowners. The effectiveness and progress of that program is highlighted on page 7. This map identifies the buffer status of riparian corridors from cropland within the watershed. Tributaries which are coded green have a buffer on both sides, orange one side, and red no buffer. Remarkably 51% of the riparian corridors within the watershed have an adequate buffer(>=30 feet). Most of these

Buffer Status of Streams

Little Cottonwood River Watershed (Brown County)



Main Stem	Miles	%
Both	47.7	73%
No or One Side	17.3	27%
Total	65	100%
Tributaries		
Both	25.7	32%
No or One Side	54.4	68%
Total	80.1	100%
Total Watershed		
Both	73.3	51%
No or One Side	71.7	49%
Total	145	100%

*Buffer defined as: > or equal to 30 feet of perennial vegetation from a perennial stream edge to crop edge.

buffers occur along the main stem of the LCR. Although a significant portion of the tributaries have been buffered, there is still room for improvement in the lower portion of the watershed. This area will be targeted from 2005-2007.

Conservation Easement Summary

- The watershed is 108,757 acres of which 96,670 or 89% is cultivated.
- 5,192 acres are under a conservation easement. This represents 5.4 % of the eligible cropland.
- Flooding has been the main concern within this watershed. In 2000 efforts began to help accelerate the adoption of conservation programs by providing additional cost-share and technical assistance through the Clean Water Partnership Program.
- One of the main programs emphasized in this watershed was the CREP program within the 100-year floodplain.

Conservation set aside programs were targeted within the watershed to alleviate common flooding issues .

- 37 easements consisting of 2,321 acres of marginal or environmentally sensitive land was enrolled into CREP. This accounts for 2.4 % of the cultivated land in the watershed.
- About 54% or 1,253 acres of the CREP easements are located within the 100-year active floodplain of the Little Cottonwood River. On the remaining land, 1,068 acres of easements are located on frequently flooded soils (wetlands) or along riparian corridors like streams and drainage ditches.
- Recently, special efforts have been focused on the CRP filter strip and farmable wetlands program.
    - A total of 651 acres of cropland have been enrolled into the CRP filter strip program and a total of 34 acres have been enrolled into the FWP program.
    - 73 miles of 146 or 51% of the eligible streams in the watershed are adequately buffered.

Feedlot Improvements

Managing an open feedlot next to a steep ravine can be challenging for an expanding dairy farmer. Through the watershed project and local NRCS and SWCD offices, special cost share through EQIP and the Clean Water Partnership Program was used to help reduce direct runoff from an open feedlot. As part of the water quality project, a state of the art milkhouse wastewater treatment system (flocculator) was installed to treat pollutants before being discharged into the river.

The flocculator system is a simple two-step process. First, wastewater is pumped into a tank, where a flocculent is added to concentrate the pollutants into a sludge that can be separated from the liquids. The solid materials are disposed of with the manure or used as a soil amendment. In the second step, the liquid portion is sent to an infiltration field under the ground for final treatment; much like how an individual sewage treatment system works. This innovative system will be a valuable demonstration site for other dairy farmers in the region.

Water tests from the milk house wastewater treatment system have shown 82% or greater removal of pollutants. The system treats about 300 gallons of wastewater per day before discharging directly to the Little Cottonwood.

Total Cost = $20,000 Cost-Share Assistance • EQIP (50%) • LCR Watershed Clean Water Partnership (25%) Technical Assistance • Brown NRCS • Brown SWCD • St. Peter Area NRCS • PremierTech		**Before**	**After**	**% Removal**
	Water Conservation			
	BOD	1191 mg/l	213 mg/l	82 %
	Solids	390 mg/l	17 mg/l	96%
	Phosphorus	52 mg/l	1 mg/l	98%

TABLE 2. Treatment effectiveness of milk house wastewater treatment system.

Program Element 1 – Initial Activities

1A-Planning

1A-1 Work Plan Development

1B-1 Hiring

- Hired Scott MacLean to serve as technician to accelerate addition of conservation practices

1B-2 Technical Committee Organization

- Coalition developed between Brown County SWCD, NRCS, Water Planning and FSA offices.

Program Element 2-BMPs

2A-1 CREP

- Sent out over 250 individualized CREP payment proposals to landowners with environmentally sensitive farmland. Approximately 37 easements covering 2,300 acres were secured in the watershed. Majority of these acres were established in the 100-year floodplain.
- Installed CREP signs to increase awareness of enrolled parcels.
- Helped marketing program through newsletters, announcements, and landowner visits.
- Interviewed landowners and developed newsletter of landowner testimonials.

2A-2 RIM

- CREP was used instead of RIM.

2A-3 CRP and Pilot Wetlands

- GIS database of CCRP eligible landowners developed.
- Sent over 300 proposals to individual landowners with follow-up phone calls or visits.
- Wetlands restored on Gerald Riederer farm.

2A-4 LCR Filter Strips

- **I**dentified priority areas that were prone to soil erosion using RUSLE2 analysis. These areas were given high priority for CRP marketing.
- Using GIS, identified all eligible landowners for CCRP CP-21 Practice. Sent proposal to each landowner followed by a phone call or letter in effort to market and increase buffers in riparian corridors. Presently, 51% of ditch stream miles have buffers on both sides and

49% of ditch stream miles have one or no side buffered.

2A-5 Wetland Restoration

- Used CREP program to target wetlands. After CREP was completed, watershed staff emphasized CP23/a/27/28/ practices. Several wetlands have been enrolled and staff have overseen restoration efforts.
- Provide assistance to NRCS by conducting weltand topographic surveys and restoration plans.
- Coordinated 20 acre wetland restoration for the Gerald Riederer wetland project.

2A-6 Waterways

- No waterways were installed during the CWP.

2A-7 Rock Inlets

- Replaced 41 open tile inlets with rock tile inlets. Most of the inlets were replaced in the Cottonwood County portion of the watershed.

2A-8 Conservation Tillage Demo.

- EQIP information sent to landowners regarding practice incentives for those willing to try reduced tillage.

2A-9 Nutrient Management

- Nutrient Management Demonstration on the Leland Haugen Farm in the Western Portion of the watershed.
- On-farm nitrogen rate demonstration on the Glen Goblirsh Farm.
- Special announcements sent to landowners to educate them on special EQIP funding opportunities for nutrient management.

2A-10 Sediment Basins

- No sediment basins were completed during this phase of the CWP.

2A-11 Lawn BMPs

- Information sent to Comfrey and Searles homeowners regarding proper lawn fertilization BMPs and the new no phosphorus rules.

Program Element 2B-Animal waste and runoff

2B-1 Gutter Construction

- Worked with Steve Hoffman Dairy Farms to develop roof runoff management.

2B-2 Runoff Diversions

- Diverted stomwater runoff from feedlot on Steve Hoffman farm. Installed sub-surface tile to divert runoff from open feedlot. Replaced open intake with rock inlet.

2B-3 Manure Storage

- Assisted NRCS and SWCD staff with Mike Selner feedlot improvement.

2B-4 Manure Management

- Demonstration project on Leland Haugen Farm comparing University Recs vs. conventional.

Program Element 2C-Stream Banks

2C-1 Bank Seeding

- No stream banks were restored during this project.

2C-2 Stream Fencing Demonstration

- A potential demonstration site was selected on the Fred Braulich Farm in the Middle portion of the watershed.

2C-3 Water Crossings

- Potential Site selected at Fred Braulick Farm

2C-4 Remote Water Systems

- Potential Site selected at Fred Braulick Farm

2C-5 Restoration of Active Floodplains

- Potential Site selected at Fred Braulick Farm

Program Element 2D-Impacts of sewage

2D-1 Low Interest Loans

- A total of 27 septic systems were upgraded form 2001-2004 using the low-interest loan

program in the watershed. 80% of these upgrades occurred in the Brown County Portion and 20% in Cottonwood County. Average cost per system was about $5,500/system.

Program Element 3-Monitoring

3-1 Site 4

- Developed contract with USGS to continue long-term USGS flow monitoring at the mouth. Funding from this site by MDNR Waters was cancelled in 2002. The LCR watershed project is now picking up those costs to keep the long-term class A gauging station running.
- August 2001. Electro fishing and macro invert sampling of 12 main stem locations with the MDNR Fisheries.
- Flow data and 88 water quality samples collected between 1996-2004. Data used to estimate pollutant loads at the mouth of the river.

Site/Year	TSS mg/L	NO_2+NO_3 mg/L	Total P mg/L	Ortho P mg/L
Site 2 (1998-2002)	88.5	12.4	0.162	0.048
Site 3 (1998-1999)	123.4	8.7	0.280	0.082
Site 4 (1998-2004)	220.7	7.2	0.252	0.112

TABLE 2. Little Cottonwood River Average Flow Weighted Mean Concentrations by site

3-3 Other Sites

- Wetland monitoring at Lyle Fisher Farm
- Colloboration with Iowa State Univerity to help identify locations for nitrate reducing wetland locations.

Program Element 4- Education and Outreach

4A-Newsletters

- Four newsletters developed and sent to watershed residents. http://mrbdc.mnsu.edu/org/bnc/pubs.html

4B-Presentations

- June-2004. Coordinated Watershed Field Day for elected officials, SWCD Board members and agency personnel. Tour focused on BMPs established in the watershed including filter strips, wetland restorations, and Steve Hoffman's flocculator milk waste treat-

ment system. Conservation Tour- http://mrbdc.mnsu.edu/org/bnc/pdf/browncо_tour.pdf

4-B-2 Schools and Festivals

- Presentations at the annual Children's Water Festival in Mankato. Over 4,000 fourth graders from BNC counties attend the day long event.
- Presentations to Watershed students at Lake Hanska Conservation Days.
- Assist Springfield High school students with water quality monitoring field day.
- Leveraged approximately 1,000 hours for the watershed project using he Gustavus Adolphus Internship Program.
- **4B-3-Work with Media**
- June-2004. Radio interview for KNUJ to promote CRP and EQIP in the watershed

4C-1 Middle MN and Basin Projects

- Assistance with Paired Watershed Study.

4D-1 LCR and Other Websites

- Minnesota State University was contracted to help develop and host a watershed based website. Newsletters, project updates, watershed tour, conservation programs, etc. have all been included. The website can be accessed at the following address: http://mrbdc.mnsu.edu/org/bnc/

Program Element 5-Data Management and Evaluation

5-1 GIS Projects

- Database of CRP eligible landowners and farm tracts for CP-21 and CP27/28/23 practices.
- Inventory of buffers along streams, ditches and main stem in the watershed. Used to target landowners eligible for filter strips.
- GIS used to identify potential wetland restoration sites in the watershed.

5-2 GIS Results

- Documentation of BMPs including location, type and other related attributes.

5-3 Technical Committee

5-4 Reporting

Program Element 6-Administration

6-1 Communications

- Semi-annual Joint Powers Board meetings were held to communicate the status of implementation.
- Updates to the Minnesota River Board

6-2 Fiscal Management

- Developed accounting program for grant expenditures and progress reports.

6-3 Project Direction

Little Cottonwood River Watershed Website-http://mrbdc.mnsu.edu/org/bnc/

Little Cottonwood Project				Cash				In-Kind			
Final Budget Expenditures 2001-2005				Budget	Monthly	YTD	Bal-	Budget	Monthly	YTD	Balance
				Budget	Expend	Expense	Balance	Budget	Expend	Expenses	Balance
Program Element											
1A - Planning											
1A-1	**Workplan Dev.**										
	Labor			960.00	84.00	2688.00	-1728.00	1450.00		510.00	940.00
1B - Personnel Coordination											
1B-1	**Hiring**										
	Labor			480.00		1908.00	-1428.00	950.00		1440.00	-490.00
	Ads			400.00		538.80	-138.80				
1B-2	**Tech. Comm. Organ**										
	Labor			960.00		312.00	648.00	2100.00		520.00	1580.00
1 Overall Expenses											
	Travel			150.00		37.95	112.05				
	Equip/Supplies			3850.00		4225.65	-375.65				
	Administration			430.00		430.00	0.00				
Program Element 1 Subtotals				**7230.00**	**84.00**	**10140.40**	**-2910.40**	**4500.00**		**2470.00**	**2030.00**
2 - Best Management Practices											
2A-1	**CREP**										
	Labor			29865.00		15096.00	14769.00	3050.00		6090.00	-3040.00
	Ed. Materials			1620.00		989.26	630.74				
	Cost Share					250.00	-250.00				
2A-2	**RIM & WRP**										
	Labor			1920.00		1638.00	282.00				
2A-3	**CRP & Pilot Wetlands**										
	Labor			11520.00	696.00	10482.00	1038.00			8405.00	-8405.00
2A-4	**LCR Filter Strips**										
	Labor			13440.00		864.00	12576.00	10000.00		4420.00	5580.00
	Contracts with Producers			6000.00		1750.00	4250.00				
2A-5	**Wetland Restoration**										
	Labor			13440.00		14474.00	-1034.00	10000.00		15611.00	-5611.00
	equip									2000.00	-2000.00
2A-6	**Waterways**										
	Labor			2880.00		168.00	2712.00	9510.00		600.00	8910.00
2A-7	**Rock Inlets/Tile Intakes**										
	Labor			11520.00		726.00	10794.00	25740.00		11800.00	13940.00

Final Budget Expend. 2001—2004				Cash				In-Kind			
				Budget	Monthly	YTD	Bal-	Budget	Monthly	YTD	Balance
2A Overall Expenses											
	Travel			1450.00		2908.22	-1458.22				
	Equip/Supplies			500.00		1259.35	-759.35				
	Administration			4360.00		4359.34	0.66				
	Technical			4800.00			4800.00				
	Citizens							14000.00		5000.00	9000.00
Program Element 2A Subtotals				**135290.00**	**696.00**	**75787.86**	**59502.14**	**78800.00**	**0.00**	**68893.80**	**9906.20**
Program Element 2B - Animal Waste/Runoff											
2B-1	**Rain Gutter Construction**										
	Labor			3840.00		420.00	3528.00	2000.00		800.00	1200.00
	Contracts			5000.00			5000.00				
2B-2	**Runoff Diversions**										
	Labor			1920.00		252.00	1668.00	1000.00		660.00	340.00
	Contracts			2000.00		5956.00	-3956.00				
2B-3	**Manure Storage**										
	Labor			1920.00		1200.00	720.00	1300.00		1240.00	60.00
2B-4	**Manure Management**										
	Labor			1820.00		1026.00	794.00	950.00		1700.00	-750.00
2B Overall Expenses											
	Travel			1350.00		348.48	1001.52				
	Equip/Supplies			100.00		292.01	-192.01				
	Administration			1350.00		1350.00	0.00				
	Citizens							1000.00		4600.00	-3600.00
Program Element 2B - Subtotals				**19300.00**	**0.00**	**10844.49**	**8563.51**	**6250.00**		**9000.00**	**-2750.00**
Program Element 2C - Stream Banks											
2C-1	**Bank Seeding Demo**										
	Labor			2400.00		732.00	1668.00	2000.00			2000.00
	Contracts			3000.00			3000.00				
2C-2	**Fencing Demo**										
	Labor			2400.00		144.00	2256.00	5000.00		80.00	4920.00
	Contracts			3000.00			3000.00				
2C-3	**Water Crossing Demo**										
	Labor			4200.00			4200.00	3500.00		1600.00	1900.00
2C-4	**Remote Water System Demo**										
	Labor			4200.00			4200.00	2500.00			2500.00
	Contracts			3000.00			3000.00				
2C-5	**Restoration of Active Floodplain**										

Final Budget Expend. 2001—2004

			Cash				In-Kind			
			Budget	Monthly Expend.	YTD Expend.	Balance	Budget	Monthly Expend.	YTD Expend.	Balance
2D Impacts of Sewage										
2D-1	**Low INterest Loans**									
	Labor		770.00		660.00	110.00	3000.00		13040.00	-10040.00
	Co. Bond Opinions		4000.00		3000.00	1000.00				
	Citizens Contribution						150000.00		142507.00	7493.00
	Supplies								67.00	-67.00
2D OVerall Expenses										
	Supplies/Admin		230.00		372.75	-142.75				
Program Element 2D - Subtotals			**5000.00**	**0.00**	**4032.75**	**967.25**	**153000.00**	**0.00**	**155614.00**	**-2614.00**
Program Element 3 - Monitoring										
3-1	**Site 4**									
	Labor		3600.00		3390.00	210.00	805.00		2155.00	-1350.00
	Lab Analysis		5660.00		3626.03	2033.97				
	USGS Station		8300.00		16125.00	-7825.00				
3-2	**Site 1-2-3**									
	Labor		3600.00	144.00	4554.00	-954.00	2900.00		4620.00	-1720.00
	Lab Analysis		5660.00		2837.80	2822.20				
3-2	**Other Sites**									
	Labor		960.00		1116.00	-156.00	845.00		1270.00	-425.00
	Lab Analysis		1390.00		719.08	670.92				
3-2 Overall Expenses										
	Travel		2000.00		2173.01	-173.01				
	Equip/Supplies		2000.00		1482.63	517.37				
	Administration		560.00		560.00	0.00				
	Mileage						450.00		262.50	187.50
	Equip/Supplies						3000.00		4249.93	-1249.93
Program Element 3 - Subtotals			**33730.00**	**144.00**	**36583.55**	**-2853.55**	**8000.00**	**0.00**	**12557.43**	**-4557.43**
Program Element 4 - Education & Outreach										
4A-1	**Newsletters**									
	Labor		2880.00	48.00	6426.00	-3546.00	1000.00		4075.00	-3075.00
	Ed. Materials		5100.00		3695.18	1404.82				
4B - Community E & O										
4B-1	**Presentations**									
	Labor		960.00		5148.00	-4188.00	500.00		6560.00	-6060.00
	Supplies		250.00		199.19	50.81				

Final Budget Expend. 2001—2004			Cash				In-Kind			
			Budget	Monthly	YTD	Bal-	Budget	Monthly	YTD	Balance
4D OVerall Expenses										
	Mileage		1500.00	25.92	2061.49	-561.49				
	Administration		2310.00		2635.56	-325.56				
Program Element 4 - Subtotals			**30260.00**	**73.92**	**46689.11**	**-16429.11**	**6850.00**	**0.00**	**24658.24**	**-17808.24**
Program Element 5 - Data Mgmt & Eval										
5-1	**GIS Projects**									
	Labor		5760.00		19712.00	-13952.00				
	Equip/Supplies		2000.00		3183.28	-1183.28				
	Technical Contract w/MSUM		6000.00			6000.00				
	Equipment						1000.00		1000.00	0.00
5-2	**GIS Results**									
	Labor		4320.00	60.00	6706.00	-2386.00	500.00		1498.00	-998.00
5-3	**Technical Committee**									
	Labor		2880.00		4096.00	-1216.00	4000.00		6230.00	-2230.00
5-4	**Reporting**									
	Labor		7200.00	3696.00	28080.00	-20880.00	2100.00		240.00	1860.00
	Equip/Supplies		2000.00		2657.44	-657.44				
5 OVerall Expenses										
	Mileage		500.00		730.06	-230.06				
	Administration		1530.00	416.66	3597.76	-2067.76				
Program Element 5 - Subtotals			**32190.00**	**4172.66**	**68762.54**	**-36572.54**	**7600.00**	**0.00**	**8968.00**	**-1368.00**
Program Element 6 - Administration										
6-1	**Communications**									
	Labor		4320.00	228.00	25719.00	-21399.00	**0.00**		3010.00	-3010.00
6-2	**Fiscal Management**									
	Labor		4320.00	36.00	5804.00	-1484.00	7500.00	200.00	8935.00	-1435.00
	Auditor/Contract		3600.00	200.00	4800.00	-1200.00				
	Insurance		1715.00	1155.25	3627.61	-1912.61				
	Rent		3675.00	375.00	4475.17	-800.17				
6-3	**Project Direction**									
	Labor		1645.00		7325.00	-5680.00	1000.00	140.00	2700.00	-1700.00
	Per Diems		2400.00	90.00	1595.00	805.00				
6 Overall Expenses										
	Mileage		500.00	42.89	2290.14	-1790.14				
	Office/Equip/Util		4000.00	290.07	6222.62	-2222.62				

Brown-Nicollet-Cottonwood Water Quality Board
322 S. MN Ave.
St. Peter, MN 56082
507-934-4140

Final Edition
June 2008

Little Cottonwood River

LCR Watershed

a Historical Newsletter

LCR *Project Timeline*

Brown-Nicollet Cottonwood Groundwater Analysis Projects Begins — 1989/1998

- Groundwater/ Surface water interconnection is studied
- Little Cottonwood River comprised the "west" study area

MLAP (Middle/Lower Minnesota River Basin Assessment Project — 1996

- Established communications with Watershed (LCR) landowners
- Intensified monitoring
- Conducted by MPCA (Minnesota Pollution Control Agency)

Phase I Spring 1997 Clean Water Partnership LCR Restoration Project begins — 1997

Tornado ravages entire length of LCR Watershed—projects & activities put on hold — 1998

Extension of LCR Restoration Project — 1999/2000

- Kevin Kuehner hired as Water Quality Specialist
- Activities resume

Since 1989 parts of the Little Cottonwood River Watershed have been monitored as part of groundwater studies. These groundwater studies led to funded examinations defining the connections between groundwater and surface water quality in the area.

In 1996 monitoring in the watershed intensified as part of a resource investigation project, to identify which surface waters could negatively affect the Minnesota River.

This intense monitoring project led to the initial project application for Clean Water Partnership funding. The application was successful and the Little Cottonwood River Restoration project began in the **spring of 1997**.

The success of the implementation project was sidetracked when the **1998 tornado** roared down the complete length of the watershed. As the counties, communities and the Brown-Nicollet-Cottonwood Water Quality Board reeled from their losses a time extension for completion of activities and extra assistance with monitoring activities was provided by the Minnesota Pollution Control Agency.

In 1999, former project administrator Kevin Kuehner (now employed with the Minnesota Department of Agriculture) was hired. In 1999 full monitoring resumed and yet another extension **through 2000** was granted to complete this implementation project. The results of this study concluded that non-point source pollutants impair the water quality in the Little Cottonwood River. Sediments, nutrients (nitrate and total phosphorus) and fecal coliform bacteria are the three main pollutants.

Phase II Clean Water Partnership LCR Implementation Project Grant awarded — 2001/2004

- Hiring of Scott MacLean as Watershed Technician
- Acceleration of voluntary adoption of BMP's and promotion of federal/state programs

Funding for Continuation of LCR Phase II Implementation Grant awarded — 2005

- Continue Protection and enhancement of LCR Watershed focused on Conservation Planning and Security Program
- Increased efforts to install/maintain filter setups, wetlands, conservation drainage projects throughout watershed

Clean Water Partnership Grant awarded to continue implementation projects and monitor effectiveness of conservation practices in the Middle Minnesota Watershed — 2007/2010

- Hiring of Ed Hohenstein, *Watershed Specialist*
  and
  Jack Bovee, *Water Quality Technician*
  to complete grant requirements

As part of this study, goals related to the Minnesota River and Little Cottonwood River Watershed were defined. These goals could be accomplished by concentrating specific Best Management Practices (BMP's) within certain areas to address water quality concerns.

In 2001 a Phase II Clean Water Partnership Implementation Grant was awarded to accelerate the voluntary adoption of these BMP recommended practices. A part of this funding was used to hire a full-time Watershed Technician (Scott MacLean—now with Minnesota Pollution Control Agency). Two popular programs the Conservation Reserve Enhancement Program (CREP) and the Conservation Reserve Program (CRP) were promoted after watershed assessments were completed identifying critical areas. **2001-2004** saw intensive marketing with additional technical assistance to accelerate enrollment of these critical areas in one of the conservation programs. Over 2,000 acres were enrolled into some type of conservation easement.

In October 2005, a grant for funding a continuation of the Phase II Implementation activities was awarded to the BNC Water Quality Board.

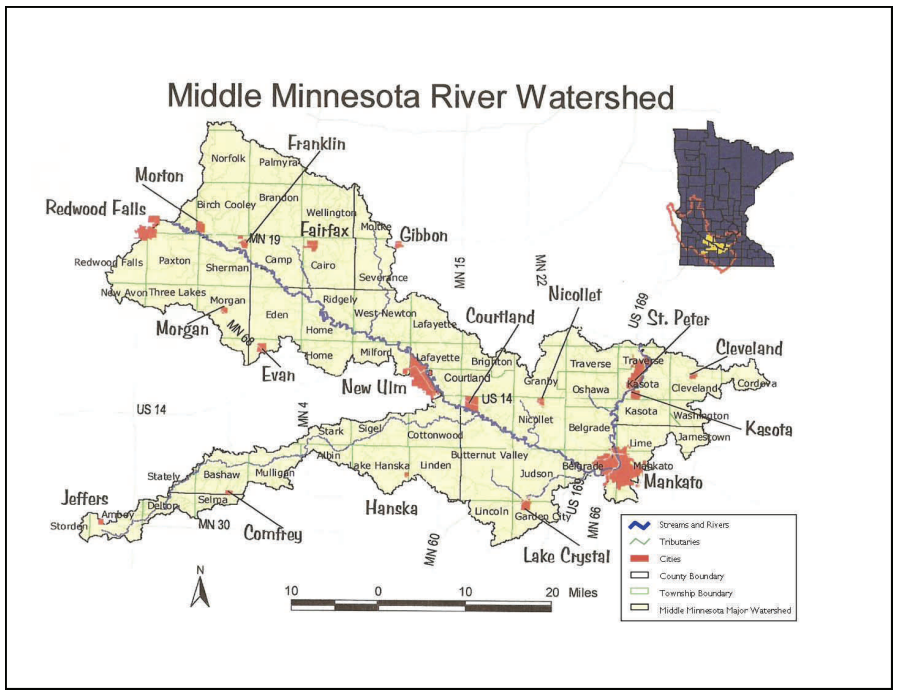
This project is in the final stages as we write this newsletter. The activities of this grant were selected to continue the protection and enhancement of the Little Cottonwood River Watershed focused on the Conservation Planning and Security Program education and preparation, nutrient management and record keeping, and a very focused effort on installation and maintenance of filter strips, wetland restorations, and conservation drainage structures throughout the watershed.

For more information about Little Cottonwood River Project results for the Phase I, Phase II, and the Phase II Continuation (when complete), is available at the following internet link:

http//mrbdc.mnsu.edu/org/bnc

What is in the future for the Brown-Nicollet-Cottonwood Water Quality Board?

As mentioned, we are pleased and proud to announce that in **October of 2007** the Brown-Nicollet-Cottonwood Water Quality Board and newly appointed staff (Ed Hohenstein and Jack Bovee), have been awarded funding to continue to implement and monitor the effectiveness of conservation practices in the Middle Minnesota Watershed focusing on the LCR Watershed and the Seven Mile Creek Watershed.



Middle Minnesota at a glance

Minnesota's Oddest Watershed...

- It is the only watershed basin in Minnesota without an identifiable and major tributary
- It is has the most first and second order streams

The Middle Minnesota Watershed Project will build upon the foundation of successes of past projects. It is our hope that coordination of efforts will positively influence water quality and continue to address TMDL (Total Maximum Daily Load) impairments listed in the watershed.

"We are made wise not by the recollection of the past, but by the responsibility of our future."

George Bernard Shaw

BNC Water Quality Board

Board Members

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Dennis Potter

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Gary Sorenson

Staff Members

Karen Swenson, Director

Marcy Pengilly

Ed Hohenstein

Jack Bovee

Please help us continue to be *responsible*….

Your are invited to participate in a Strategic Planning Day, July 24, 2008. Working with a facilitator from the University of Minnesota, we will celebrate the 16 years of the Brown-Nicollet-Cottonwood Water Quality Board. Working together we will take a day to examine our goals for the future by examining our services and activities as they relate to new opportunities such as the states emphasis on TMDL's, the Clean Water Legacy Act and a new Federal Farm Bill. If you are interested in participating please contact Marcy Pengilly at bnccwp@hickorytech.net or toll free at 800.931.4140. (Lunch will be served to all participants so you must pre-register).

"Reflecting on our success, analyzing our past & planning for the future."

Finally…

Thank You to everyone who has been involved in the Little Cottonwood River Projects; all of our friends, staff past and present, colleagues, technical advisors, landowners and especially all of those who have made a commitment to protect one of our most valuable resources **WATER.**

Your contribution has been genuinely appreciated.

BNC Water Quality Board, SWCD and NRCS

January 2003

CONSERVATION HIGHLIGHTS

Leaving a Legacy through Conservation in the Little Cottonwood River Watershed

Kevin Kuehner-Little Cottonwood River Watershed Project

Seeding down marginal cropland with native grasses, trees, and forbs is one of the best management practices (BMPs) that Brown and Cottonwood County producers can use to protect soil and water quality. However, BMPs like buffer strips, and prairie and wetland restorations go beyond just protecting the soil and water. They are an excellent management tool because they offer multiple benefits. Better wildlife habitat, good neighbor relations, and the promotion of a sustainable concept of land management are just a few.

Several landowners in the **Little Cottonwood River Watershed** have taken advantage of two very popular programs, the Conservation Reserve Enhancement Program (CREP) and the Continuous CRP program, and each have their own reasons for participating. Between CRP and CREP almost 4,000 acres have been enrolled by an estimated 150 landowners within the 170 square-mile watershed. This article highlights just a few of the landowners and their reasons for participating in the voluntary programs.

Gary Rathman, landowner in Mulligan township, enrolled his land into the CREP program to increase the bio-diversity on his farm through a prairie restoration. When it comes to prairie restoration and wildflowers Gary Rathman has done his homework. "I wanted to restore what was once on my land," states Gary. I felt the CREP program was intended to help restore what was once part of the original landscape. In the case of my land it was prairie." In just one year Gary has turned part of his farm from a corn/soybean field into a very diverse ecosystem. Through the help of Tom, Kathy, and Greg of the SWCD/NRCS, the DNR, prairie seed dealers, and some studying Gary enrolled part of his farm into the CREP program.

Gary Rathman-landowner in Brown County stands near a 122-acre field recently enrolled in the CREP program. The field was planted in 2001 with over 248 different species of prairie wildflowers (forbs) and 23 different grasses native to the area. When climaxed, this prairie will be one of the largest and most diverse prairies restored by a private landowner.

The Minnesota River Conservation Reserve Enhancement Program combines the USDA Conservation Reserve Program with the state's Reinvest in Minnesota Reserve (RIM) program to retire 100,000 acres of environmentally sensitive land in the 37-county Minnesota River Basin. Targeted acres include frequently flooded cropland in the Minnesota River Valley and its principal tributaries, riparian buffers along cropland identified as a major polluter, and wetlands that can be restored and provide water quality and wildlife benefits to the Minnesota River and its tributaries. As of

Leaving a Legacy through Conservation in the Little Cottonwood River Watershed

"I wanted to restore what was once was on my land," states Gary. I felt the CREP program was intended to help restore what was once part of the original landscape. In the case of my land it was prairie."

Pictured above, prairie blanket flower, just one of many prairie forbs blooming during the first growing season. Over 240 varieties of wildflowers were planted on the 122-acre field at the Rathman farm. The prairie was recently restored through Minnesota's Conservation Reserve Enhancement Program that retires marginal farmland into a permanent easement for water quality, and habitat purposes within the Minnesota River Basin. (Photos by Gary Rathman)

recently the 100,000 acre goal has been met with over 4,000 of those acres being signed up in Brown County. The initiative was one of the largest efforts to restore habitat and improve water quality in the Minnesota River—one of the nation's most polluted rivers—and its tributaries.

"When I heard about the program I became interested and after learning more I decided to participate in the program," Rathman said. After enrollment at the SWCD office in Sleepy Eye, Rathman spent most of the 2001 winter planning the project and selecting what to plant. "I wanted my land to be as diverse as possible. I wanted to attract as much wildlife as I could. Hopefully one day when I look out at my field from my house I will not only have prairie chickens, partridge, and pheasants back on my land but many types of small creatures like butterflies as well." To accomplish that goal Gary knew he had to plant variety to get variety. Gary planted over 248 species of wildflowers and 23 different species of grasses native to the area on a 122-acre field. Gary's planning is already paying off. In just the first year, hundreds of wildflowers were in bloom during different stages of the summer and the short and tall prairie grasses are starting to take hold. The Rathman CREP Prairie Restoration is planned to be a part of the Brown County Watershed Conservation Tour in August of 2003. The Rathman farm is located in the Little Cottonwood and Watonwan River Watersheds.

Not only does Gary have some prairie being restored but also some buffer strips along a drainage ditch to help prevent runoff from entering the surface water. Pictured above Gary Rathman stands in a dense planting of switch grass along a drainage ditch on his property in southern Brown County.

Roland Richert, Bashaw township, also decided to enroll some of his land into the CREP program. Roland has his reasons for enrolling 116 acres into the program. "It is marginal crop land. In wet years the bottomland would flood and the sandy soil would produce. During dry years the bottomland would produce but the sandy soil would burn. In the best years, this was 170-bushel corn but with more frequent flooding and rotten grain prices, CREP became a lifesaver. It saves so much soil from

Roland Richert stands in front of a 116-acre field recently enrolled in the CREP program along the Little Cottonwood River.

Leaving a Legacy through Conservation in the Little Cottonwood River Watershed

getting into the Little Cottonwood River and is really attracting the wildlife. There are so many more pheasants out there and the deer love to run and hide in that tall grass. I really like to walk and look at the wildflowers too. Wildlife needs room too, so I gave some to them. CREP is still farming, just in a different type of way," states Richert. Roland Richert was one of the first landowners in Brown County to participate in the program.

"CREP is still farming, just in a different type of way."

Regular flooding and poor yields were enough to make Marvin and Esther Windschitl look for an alternative to cropping some of their farm land. "The area is close to the Little Cottonwood River. When the river would rise, about 20 acres would flood out. We would only get a crop off of it about once every five years. The land is even too low to tile." For Marvin, enrolling some of his land in the CREP program made good sense. The area that used to produce corn and soybeans has now been planted to about 60 acres of native prairie grasses which will help reduce erosion and agricultural run-off. The decision to enter into the CREP program will not only help the water quality of the Little Cottonwood River, it will also improve Marvin's bottom line. "The CREP payments are better than what I could get from farming the field," said Marvin. The trend toward larger and larger equipment also influenced Marvin's decision. "It's an odd shaped field, so it's hard to get into it with larger equipment." Marvin and Esther also recognize how important native prairie land can be for wildlife. "The land has only been planted (to grass) for a year. But we do see pheasants and deer on CRP land. Lots of wildflowers too." One major concern some landowners have when enrolling land into a conservation program is trespassing and unauthorized hunting. That hasn't been a problem for Marvin. "The land is posted. That keeps people off." All in all, the CREP program was a smart choice for the Windschitls as it will benefit the environment and themselves. Once the grasses become established, Marvin and Esther will have a beautiful stand of native prairie and a legacy that will extend long beyond the time they retire from farming.

Frequent flooding was one of the main reasons Marvin and Esther Windschitl enrolled 60 acres into a conservation program.

Gerald and Lorrel Riederer have their reasons for enrolling some of their land into a conservation program."The 10-acre area I enrolled into CREP sits along the Little Cottonwood River and used to be really good hay meadowland when we had cattle. I liked going to that area of the farm, since it was so serene. After we sold the cattle we had no need for the hay, but still needed to provide income so about 20 years ago we converted it into a corn and soybean field. Because of flooding, and washing problems, the low bottom ground created setbacks for us in the spring.

Pictured above Gerald explains the difficulty of farming the wet soils in his field. The 10-acre field has recently been enrolled into the CREP program and planted into native grasses.

"The grasses will be great for pheasant cover. There was good hunting when I was a kid, but not anymore. I really miss hearing the crow of a pheasant in the morning. Hopefully I can help bring that back."

BNC Water Quality Board, SWCD and NRCS

Over 2,000 acres of environmentally sensitive land like this one on the Windschitl farm have been take out of production in the LCR watershed though the CREP program

Watershed Marginal Crop Land -A total of 2,321 acres of marginal or environmentally sensitive land was enrolled into CREP. This accounts for 2.4 % of the cultivated land in the watershed. About 44% or 1,013 acres of CREP is located within the 100-year active floodplain of the LC River. The remaining land ,1,308 acres, is located on frequently flooded soils (wetlands) or along riparian corridors like streams and drainage ditches.

BROWN NICOLLET COTTONWOOD WATER QUALITY BOARD

322 S. MN Ave.
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After our retirement from farming our renter faced the same problems so he actually recommended the CREP program to me." Riederer liked the idea of conserving the land and seeing it go back to its natural state while keeping it in the family. "The Riederer farm is a century farm so keeping it in the family was important to us," notes Gerald.

Gerald and wife Lorrel stand next to area soon to be enrolled into the new Farmed Wetland Program (FWP). The FWP is a new Conservation Reserve based program designated to the prairie pothole states –North Dakota, South Dakota, Minnesota and Iowa. The CRP based program allows producers to enroll cropped wet areas 5 acres in size or less into the program for 10-15 years.

Gerald has also recently enrolled almost 15 acres into a new USDA Wetlands in CRP pilot program. The new program, also know as the Farmed Wetlands Program (FWP) allows landowners to enroll small wetland areas and adjacent buffers in the continuous signup of the Conservation Reserve Program for 10-15 years. The new program is intended for upland, cropped, wetland basins no bigger than five acres. The new CRP program is proving to be a valuable tool for many Brown County farmers since it helps them deal with the challenges related to managing consistently wet areas while improving water quality and wildlife habitat. Gerald found out about the program when the Little Cottonwood River Watershed group and NRCS office sent out proposals to eligible landowners. "I really couldn't see any reason not to enroll in the program. Even with tiling I have always had drainage problems with those areas, notes Gerald. In some years I had to wait for the ground to freeze before I could get the corn out. I was going to add more tile, but the idea of being able to square off the field along with the competitive CRP rental rates convinced me otherwise." When asked what the site will be like in the future, Gerald replied, "The grasses will be great for pheasant cover. There was good hunting when I was a kid, but not anymore. I really miss hearing the crow of a pheasant in the morning. Hopefully I can help bring that back."

Whether it's a financial or conservation oriented reason, or just wanting to hear the cackle of pheasant once again on the land there are many reasons why local landowners and farmers in Brown and Cottonwood County are enrolling some of their land into conservation programs. Thanks again all to all those landowners of the Little Cottonwood Watershed for leaving a legacy through conservation.

Special thanks for the interview participants: Gary Rathman, Gerald and Lorrel Riederer, Marvin and Esther Windschitl, Ken Drexler, and Roland Richert.