

## ***Chapter 1 Project Background***

The South Branch Root River Watershed Clean Water Partnership Project area begins in the headwaters of the South Branch of the Root River west of Forestville State Park in southeastern Minnesota. The project area lies in western Fillmore County and eastern Mower County. About 80 percent of the project area is in Fillmore County. (See [Appendix 3: Map 1 South Branch Root River Clean Water Partnership Project](#))

Discussion about a watershed project for the South Branch of the Root River west of Forestville State Park began in 1995. Several meetings were held in late 1995 and early 1996 which included local citizens and staff from two counties and several state agencies. Due to increased emphasis both at the state and federal level on watershed management, prospects for funding for a watershed project were favorable. Those attending the meetings were receptive to the idea of a project that would provide additional funding for practices that would protect water quality. For several reasons, this project has potential to have a significant effect on water quality in the South Branch and to provide valuable lessons in watershed management. Among those reasons:

- The project area is at the headwaters of the South Branch of the Root River. Any protection of water resources here has a positive effect on water quality downstream.
- The project falls in two counties providing an opportunity to learn from cooperation across county lines.
- Forestville/Mystery Cave State Park, which offers activities dependent on high quality water resources, directly benefits from practices in the watershed that reduce flooding and contaminants, especially sediments, nutrients and bacteria.
- The trout streams in this area are some of the premier streams in the state and the upper Midwest and maintaining that standard is important environmentally and economically.
- The variation in topography and land use practices from west to east offers an opportunity to evaluate the effectiveness of a variety of best management practices.

Following the community meetings, a survey was conducted in 1996 in which over 700 surveys were mailed to residents and landowners within the watershed. (See [Appendix 1 for survey and results](#).) Of the 153 surveys returned, 83% were in favor of pursuing a watershed project.

Over the next year, a steering committee was formed from people who had attended the initial meetings. Several meetings were held to determine various means of educating residents about the watershed. It was also decided to apply for a Clean Water Partnership (CWP) Program grant through the Minnesota Pollution Control Agency (MPCA). The application was submitted in November of 1997, and the grant proposal for \$61,500 was approved in February of 1998. The grant proposal included three components for funding: watershed assessments, surface water monitoring, and karst investigations, plus education and administrative activities not funded through the grant. The initial grant agreement was extended for one year in 2001 to March, 2002 to allow an additional field season for data collection.

## **1998**

The first steps in understanding the project area were taken by gathering available information and knowledge about land use and the condition of the stream corridors and watersheds. A summer intern hired by Fillmore County began organizing available information about feedlots and wetlands and identifying additional wetland areas and the land use adjacent to the wetlands. In the fall, staff from Mower Soil and Water Conservation District (SWCD), Fillmore SWCD, Fillmore County, Minnesota Department of Natural Resources (MN DNR) and MPCA conducted an assessment of the subwatershed areas using the Tailored Integrated Stream Watershed Assessment as a model. Fillmore SWCD conducted a county-wide crop residue transect survey. Mower SWCD Geographic Information System (GIS) staff developed GIS maps, including land use, using existing data layers.

The initial monitoring undertaken in 1998 consisted of a network of seven citizen volunteers monitoring ten sites using the MPCA Citizen Stream Monitoring Program protocol . The volunteers recorded water clarity using a transparency tube, temperature, stream stage, and ratings of stream appearance and suitability for recreation. The volunteers also recorded precipitation.

Biological monitoring also began in 1998 with a fish and invertebrate survey conducted in July by faculty and students from the biology department at Winona State University and a freshwater mussel survey conducted by Malacological Consultants from LaCrosse, WI.

Four dye trace studies were conducted in the project area in 1998. The traces supplement information in the Fillmore County Geologic Atlas and better define springshed boundaries and the interconnections between surface and ground water in the project area. Geophysical studies using ground penetrating radar and equipment measuring electrical resistivity to determine depth to bedrock and to locate buried sinkholes and underground passages were also completed.

### **1999**

Staff conducted a feedlot windshield survey to compare existing feedlot sites with existing permit data. This information was used to begin producing a GIS layer of feedlot locations. The project area was designated as a Conservation Priority Area by the NRCS and was approved for \$250,000 in EQIP funds for conservation practices. Staff involved with the watershed project participated in meetings to prioritize practices for funding. Both Mower County and Fillmore County completed the crop residue transect survey on a countywide basis. Fillmore County transect sites were located using GPS equipment.

Permanent monitoring equipment was installed at three primary monitoring sites along the main stem of the South Branch: Historic Forestville bridge in the park (lower site), Hafner bridge one mile north of Etna (middle site), and County Road 14 bridge in Mower County (upper site). A Campbell CR-510 datalogger connected to a Druck pressure transducer measured and recorded stream stage every 15 minutes. The middle site also had a precipitation gauge connected to the datalogger. A permanent monitoring station is to be maintained at the lower site throughout Phase II.



**Figure 1 Datalogger and rain gauge**

Water chemistry monitoring began in 1999 at the three primary sites, as well as five secondary sites on the main tributaries: Canfield Creek, Forestville Creek, Etna Creek, Mower County Judicial Ditch #1 (JD #1), and the South Branch upstream from JD #1. Parameters analyzed included total nitrogen, total phosphorus, ammonia-nitrogen, chloride, total suspended solids, and turbidity, as well as fecal coliform bacteria on several of the monitoring dates. There was extensive flooding in July which damaged some monitoring equipment. A one-day bacteria sample collection was done in August with the help of the citizen volunteers at 11 of the volunteer monitoring sites.



**Figure 2 Collecting water samples at Etna Creek**

## **2000**

At a January meeting of the technical staff, available GIS data and GIS needs for the project were assessed in order to focus those efforts. Digitized feedlot locations and parcel data for the project area were completed.

Project partners were involved in on-going discussions of a proposed JD #1 maintenance project. Suggestions were made for minimizing water quality impacts should the project proceed. The project is currently in the state environmental review process.

In cooperation with MN Department of Health, samples from nine public water supply wells were analyzed for tritium. In addition, 13 private wells and one spring were also sampled. This

age-dating technique helps in understanding ground water recharge in the aquifers used by the domestic wells in the project area.

Water chemistry monitoring continued on a similar schedule to that of 1999. Floods occurred in late May and early June and again in July. The citizen volunteers assisted with another one-day bacteria sample collection in August. Fourteen stream sites and 13 springs were sampled.

## **2001**

A project extension was granted by the MPCA to allow an additional field season of monitoring and data collection for the project. Monitoring initially continued at the three primary sites until bridge construction forced the discontinuation of monitoring activities at the upper site in Mower County. The lower site was the most frequently sampled site in 2001. Bacteria samples were collected again at nine springs in August, as well as tritium samples at those sites. Citizen stream monitoring volunteers continued monitoring 12 sites on the main stem and the tributaries. These data are included in Chapter 6 of this report.

## **2002**

Equipment was purchased in 2002 to expand the capabilities for a permanent monitoring station at the lower primary site at the Historic Forestville Bridge in Forestville/Mystery Cave State Park. In addition to stream stage, probes to measure pH, conductivity, temperature, dissolved oxygen, and turbidity connect to a datalogger to allow continuous recording of these parameters. Grab samples were collected during high flows in June. Sampling included pesticide samples as part of a countywide program to get baseline information about pesticide levels in the main branches of the Root River in Fillmore County. This data is included in Chapter 5. Crop residue transect surveys were completed in both Fillmore and Mower counties. Eight volunteers continue to monitor 12 sites on the main stem and tributaries as part of the MPCA Citizen Stream Monitoring Program. Three of these volunteers attended training in July to participate in biological monitoring sponsored by the MN DNR over the next five years. Volunteers monitor a site once each year between July 1 and October 15 following protocol established by the DNR. Samples are sent to Winona State University where the organisms are counted and identified.

## Education

In addition to data collection, educational activities were carried out to keep watershed residents, public officials, local groups and organizations and other interested persons informed about the project and the knowledge being gained. A watershed newsletter called *Watershed News* has been mailed out twice each year since April, 1998, except in 2001 when only one issue was published and mailed. Over 850 copies of each issue are mailed, plus additional copies are distributed at the Mower and Fillmore SWCD offices and to other agencies. Articles are contributed by technical staff and citizen members on the watershed committee. (See Appendix 2 for copies of newsletters.)



**Figure 4** Bev Nordby talks with a landowner.



**Figure 3** Jeff Green explains dye trace results

In November of 1998 and 1999, open houses were held in

Ostrander where different research elements of the project were highlighted. About 75 to 80 people attended in 1998, and in 1999 attendance was about 50 people. Attendees could view displays about different

topics, such as the Mower County Judicial Ditch #1 maintenance project, the River Friendly Farmer program, livestock watering systems, etc. Committee members and researchers were on hand to answer questions about the project. Free nitrate analysis of private well water samples was offered at both open houses.

In 2000, instead of an open house, the project hosted an informational meeting about the Ironwood Landfill in November. The Ironwood Landfill is a Superfund site located in the watershed. Impacts to ground water and surface water are thought to be contained, but interest among watershed residents is still high. About 40 people attended the meeting in the Cherry

Grove Community Center. Fillmore County Commissioner Gary Peterson presented a history of the site. MPCA staff Don Abrams, project manager, and Jean Olson, hydrologist, presented information about the clean up and monitoring program as well as future plans for the site.

During the summer of 2001, committee members met with five township boards and the Ostrander City Council to update them on the project and get feedback about implementation activities. The project coordinator provided a water quality presentation to 32 5<sup>th</sup> grade students at the Grand Meadow school, which included information about monitoring that is going on in the South Branch Root River watershed. Twelve watershed residents, project staff and volunteers were part of a focus group examining the relationship of landowners to their river and watershed. The focus group was facilitated by a graduate student from the University of Minnesota, who was collecting information about landowner perspectives on stream health and conservation program performance in southeastern Minnesota.

In 2002, the committee decided to hold a bus tour and open house on September 12 to culminate the end of the Phase I diagnostic study and introduce watershed residents to elements for Phase II implementation. The bus tour began and ended at Forestville/Mystery Cave State Park, and visited 20 sites throughout the watershed that illustrated the diversity of the landscape, the karst features, and existing programs and practices that are addressing some water quality concerns in the watershed. The Fillmore County Cattlemen's Association served a meal to the tour participants.



**Figure 5 Bill Thompson, MPCA, explains physical stream data to the tour group.**

The open house was held in the park picnic shelter. Thirty-one people attended the tour and open house, and about half a dozen people came just for the open house. Two high school groups with a total of 33 students came to the park that morning to learn about the watershed project. They learned about water chemistry monitoring, participated in collecting aquatic macroinvertebrates to identify, created a stream corridor using a stream table, and observed an electrofishing demonstration by the DNR.



**Figure 6** Forestville/Mystery Cave Park staff show students how to collect aquatic macroinvertebrates.



**Figure 7** Students identify aquatic macroinvertebrates collected from the South Branch.



**Figure 8** Students observe how the characteristics of a stream can change using a stream table.



**Figure 9** Students observe electrofishing.

Other educational activities include:

- A watershed tour held in April, 1998 for steering committee members, local officials and state and local staff attended by 14 people;
- A septic system installation demonstration sponsored by Fillmore County was held near Ostrander in September, 1998 allowing the public to view the installation of a mound system;

- A display about the project was set up at the Uff-da Days celebration in Ostrander in August, 2000;
- A tour of the newly designated Cherry Grove Blind Valley Scientific and Natural Area held in October, 2000 attended by 16 people.
- Several presentations on the project given at local schools and at Forestville State Park.

### **Administration**

A steering committee made up of technical staff and citizen volunteers has been meeting about six times each year since 1996. These volunteers are invaluable to the success of this project. They have helped to guide the project's activities, assisted with a variety of the educational activities, and provided input into the development of the Phase II Implementation Project proposal. The citizen members who have served or are currently serving include:

Diane Hafner, Bloomfield Township  
 Carol Kohn, Bloomfield Township  
 Frank & Karol Krahn, Bennington Township  
 Chris Root, Forestville Township  
 Sue Schrage , Forestville Township  
 Dan Terbeest, Bloomfield Township Board  
 Johannah Vreeman, Forestville Township  
 Bob & Eloda Wood, Forestville Township  
 Darlene Coffman, Forestville Township

Technical expertise was provided on the committee by:

Lee Ganske, MPCA Project Manager  
 Jeff Green, MN DNR-Waters, Regional Ground Water Specialist  
 Tex Hawkins, U.S. Fish & Wildlife Service, Winona, MN  
 Bob Moody, MN DNR-Fisheries, Lanesboro Area Fisheries  
 Warren Netherton, MN DNR, Mystery Cave Manager  
 Bev Nordby, Mower SWCD Manager  
 Donna Rasmussen, Fillmore County Water Plan Coordinator

Kevin Scheidecker, Fillmore SWCD Administrator

Mark White, MN DNR, Forestville State Park Manager

Other technical support that is gratefully acknowledged has been provided by:

Calvin Alexander, University of Minnesota Department of Geology and Geophysics

Pat Baskfield, MPCA Hydrologist

Corey Hanson, MN DNR Hydrologist

Marian Havlik, Malacological Consultants, LaCrosse, WI

Jeremy Maul, Fillmore SWCD GIS Technician

Neal Mundahl, Winona State University Biology Department

Tom Roessler, Mower SWCD GIS Technician

Bill Thompson, MPCA Research Scientist

Shane Vatland, Intern

Jeff Weiss, MN DNR-Fisheries, Lanesboro Fish Hatchery

USDA Natural Resources Conservation Service, Fillmore and Mower Counties

Fillmore County has served as the fiscal agent for the CWP grant.

**Table 1: Project Timeline & Accomplishments**

<i><b>Program Element</b></i>	Spring '98	Fall '98	Spring '99	Fall '99	Spring '00	Fall '00	Spring '01	Fall '01
1) Watershed Assessment								
Feedlots								
Existing feedlot data	X							
Windshield survey			X					
Wetlands								
Existing wetlands data	X							
TISWA		X						
GIS mapping	X	X						
Compile existing data	X	X						
Feedlots digitized				X	X			
Parcel data digitized					X	X	X	
Crop residue survey	X		X		X		X	
2) Surface Water Monitoring								
CSMP volunteers	X	X	X	X	X	X	X	X
Water chemistry			X	X	X	X	X	X
Biomonitoring								
Fish/invertebrates	X		X					
Freshwater mussels	X							
3) Karst Investigations								
Dye traces	X	X	X	X	X	X	X	
Geophysics		X						X
Spring monitoring								
Bacteria						X		X
Tritium								X
Tritium - wells						X		

<b><i>Program Element</i></b>	Spring '98	Fall '98	Spring '99	Fall '99	Spring '00	Fall '00	Spring '01	Fall '01
4) Education								
<i>Tour</i>	X					X		
<i>Newsletter</i>	X	X	X	X	X	X	X	Planned
<i>Open house</i>		X		X				
<i>Ironwood Landfill mtg</i>						X		
<i>Watershed Focus groups</i>								Planned
5) Administration								
<i>Meetings</i>	X	X	X	X	X	X	X	X

<b>Table 2: South Branch Root River Clean Water Partnership Grant Expenditures</b>									
	<b>1998</b>			<b>1999</b>			<b>2000</b>		
	CWP Grant	In-kind	Cash Match	CWP Grant	In-kind	Cash match	CWP Grant	In-kind	Cash Match
<b><u>Administration/Coordination</u></b>									
Fillmore County WPC		2450.00			1790.00			1343.00	
Mower SWCD		1700.00			100.00		1100.00	250.00	
Fillmore SWCD		1400.00			200.00			875.00	
Steering Committee		2052.00			980.00			1431.00	
<b><u>Assessment</u></b>									
Wetlands (=98 intern)	763.00	250.00	1800.00						
Feedlots					1710.00				
Subwatershed assessment		1600.00						14677.00	
<b><u>Karst Investigations</u></b>									
Dye traces	1000.00	4875.00	3000.00		4875.00		8000.00	9750.00	4000.00
Geophysical studies	3500.00								
Tritium Analysis							3480.00	533.00	
Spring monitoring									
<b><u>Surface Water Monitoring</u></b>									
Citizen Monitoring		914.00	354.00		2775.00	246.00		2156.00	
Biomonitoring	2030.00								
- WSU Fish/Invertebrates				2293.00	1200.00			4396.00	

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	CWP Grant	In-kind	Cash Match	CWP Grant	In-kind	Cash match	CWP Grant	In-kind	Cash Match
- Mussel survey	8000.00			500.00			500.00		
Water chemistry/stream stage				5862.00	530.00	3849.00	6221.00	397.00	
<b><u>Education</u></b>									
Tour		889.00							
Newsletters		1936.00			1900.00	1704.00		1200.00	1782.00
ISTS Demo		330.00							
Open House		703.00			1950.00	737.00		1695.00	
<b>TOTALS</b>	<b>15293.00</b>	<b>19099.00</b>	<b>5154.00</b>	<b>8655.00</b>	<b>18010.00</b>	<b>6536.00</b>	<b>19301.00</b>	<b>38703.00</b>	<b>5782.00</b>