

# MINNESOTA RIVER BASIN PROGRESS REPORT -2010







# Minnesota River Basin: 2010 Progress Report



## Minnesota River Board

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The Minnesota River Watershed is very rich with culture and in many cases very misunderstood. It goes without saying that our modern life styles impact this diverse entity in both subtle and not so subtle ways. We as a people have, in most cases, unknowingly, contributed to the degradation of her water quality, to the point that it has become unusable and just plain socially unacceptable. The problem is one that encompasses all of us. It cannot be narrowed down to one source. We are all partners in it, and as partners we are also the solution.

I have had feelings like many people, the problem is too big, I'm just one person, I don't know what I can do anyway, I'm not the one doing it, and so on. Most of these feelings come from a lack of knowledge and understanding. I have found that once people are given the tools, they become confident and act boldly, especially when it comes to something where feelings run so deep and culture, heritage and economics are such a large factor.

- Scott Sparlin, Coalition for a Clean Minnesota River

## **Comments from the Minnesota River Board Executive Director**

## Dear Reader,

Progress measurements, at first glance, appear to be relatively straight forward; however, how do we measure the results of all the work done by entities in the Minnesota River Basin in a meaningful way? This document strives to provide a cross-section of the multitude of initiatives done in the Minnesota River basin to improve watershed health and water quality. The following collection of case studies and summarized data showcase the work that so many dedicated people have completed in the Minnesota River basin – people that have elected to make a difference in our watershed by getting off the sidelines and taking action.

Since coming to the Minnesota River Board in 2005, I have been inspired by the creativity and dedication of those working to conserve and protect our soil and water resources – from SWCD staff to grassroots citizens, from elected officials to members of the clergy, and from agencies to agricultural producers – it has been apparent to me that we are all in this together. Although there are many times that various stakeholders seem to be at odds with each other, common ground is always within reach. Tom Barrett, a former U.S. Representative from the state of Wisconsin stated that "If the rain spoils our picnic, but saves a farmer's crop, who are we to say it shouldn't rain?" I have always found a strong sense of reality and truth in this simple statement. As a modern society, we are all part of an ever-changing landscape in which we shape our lives, from earning an income to raising our children – and we have to understand that our future depends on our ability to understand each other's needs. We all have a vested interest in sustaining and improving the Minnesota River basin for future generations and we all need to continue to take action and work together.

Progress is not made by those that sit back and wait for someone else to ask them to dance, but rather by movers and shakers that generate concepts, build support, and implement ideas. There is much work yet to be done, but the accomplishments of those that serve in this basin have made a difference, and evidence of progress is everywhere. How we measure progress is not an easy question to answer, but I hope that as you work your way through this document, you gain an appreciation for the amazing quality, quantity, and diversity of conservation and restoration efforts implemented here - dedication to a resource that has made the Minnesota River basin a better place to work, live, and recreate.

## Sincerely,

Dr. Shannon J. Fisher, Minnesota River Board Executive Director

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## Introduction

Watershed and water quality management has changed dramatically in the Minnesota River basin over the past 20 years, but how do we measure progress associated with these efforts? One might add up the number of conservation practices installed or the amount of sediment reduced as a result of those practices. We may want to look at the diversity of fish found in the river or the growing interest in fishing. Maybe it is as simple as who comes out to pick up trash and haul away leaves to the compost site before it ends up in the river. Signs of progress are everywhere in the basin; from the significant reduction of phosphorus flowing out of wastewater treatment plants to the rising level of civic engagement, and the resurgence of people using the river for recreational purposes. Progress may be difficult to measure, but it is nonetheless evident.

One of the many media-related organizations taking a special interest in the Minnesota River basin is the Mankato Free Press, who has been writing about a healthier river but also reminding people there is still much more to be done to improve, restore and protect this significant state and national resource. A recent editorial spelled out their opinion of Minnesota River progress:

In many ways, the ongoing restoration of the Minnesota River is a story of success. The water is less polluted, animals and aquatic organisms are seeing an encouraging rebound and appreciation for the value of the river continues to grow.

A rebound in the fish population has been one of the more obvious success stories. Anglers will attest that there are more fish and more species of fish. Mussel numbers, too, have improved although not to the extent of the resurgence of fish.

Every year in July, the community of Franklin -Catfish Capitol of Minnesota - holds Catfish Derby Days on the Minnesota River. This event attracts both diehard fishermen and those just looking for a family-fun event. People come from all over the Midwest to try their luck at catching one of the large catfish found in the Minnesota River.



The return of one animal in particular – the otter – is certain to bring enjoyment and encouragement to those in the river valley. Wiped out by pollution and trapping early in the last century, the re-introduced otter population is steadily making the river and its tributaries home. For most people, seeing the playful otters is a sight matched perhaps only by the now common sight of bald eagles.

Stricter state regulations have led to phosphorus levels dropping significantly. Cities across the basin have built new treatment plants that discharge a fraction of the phosphorus of the old plants. A ban on phosphorus in lawn fertilizer has further helped. It attests to the value of targeted and sensible regulation accompanied by the financial assistance needed to meet goals.

Even with a multitude of progress indicators, there are still problems and concerns to be addressed and solutions to be found. Research has suggested that runoff from our landscape is having potentially serious consequences on our downstream neighbors – from Lake Pepin to the Gulf of Mexico. Agriculture remains critical to our basin's economic vitality, but it has also often been implicated as a significant contributing factor to our water quality challenges.

Not everything has shown improvement. Nitrate levels are still a concern and the pressure of development and farming has a growing impact on the rivers. Being in the midst of some of the richest farmland in the country brings special challenges. Increased farmland drainage the past decade or so appears to have brought one of the biggest challenges to the basin. Water from millions of acres of land is rushing too fast to the rivers, bringing increased erosion, pollution and flooding threats.

The statement above brings forth several arguments that require additional research and agricultural drainage is only one factor influencing water quality in the Minnesota River basin. Others, like emerging contaminants of concern (*e.g.*, endocrine disuptors), are only beginning to be understood and their ecological impacts need further assessment. Other issues certainly include ongoing loss of wetlands, prairie, forests and set-aside land; the rising level of water used by industries, cities and others; stormwater management, availability of funding to continue cleaning up the Minnesota River; and how to balance volunteer efforts versus regulation.

Ultimately, all of us living in the Minnesota River basin can be proud of the work that has been done. The level of commitment and innovation exhibited by our citizens, nonprofit organizations, landowners, civic groups, farmers, government agencies and others to improve, protect and restore water quality demonstrates that people deeply care for this resource. At the same time, however, we need to remain vigilant regarding what still needs to be accomplished to create a healthy, vibrant Minnesota River we all can enjoy today and in the future.



Those new problems, like the past ones, can be improved with dedication, reasonable regulation, technological advances and public support. The public support is easier to get these days. That, perhaps, is one of the biggest successes in our valley: a renewed appreciation for the value and beauty of the Minnesota River.

## Background

The Minnesota River cuts through south-central Minnesota on a 335 mile journey from Big Stone Lake on the South Dakota border to its confluence with the Mississippi River at Fort Snelling. Encompassing close to 20 percent of Minnesota's landmass, this large basin drains 16,770 square miles or roughly 10 million acres in the state, along with a small portion of northern Iowa and

eastern South Dakota. Twelve major watersheds make up the Minnesota River Basin, with the Yellow Medicine-Hawk Creek Watershed split into two administrative units. Over 10,000 years ago when the water from glacial Lake Agassiz spilled southward it created the glacial River Warren. This immense and powerful glacial river carved out the present-day Minnesota River Valley during a catastrophic event. As a result, the channel of the Minnesota River is constantly shifting and changing due to the large amount of space it has available on the valley floor.

A great gash, 335 miles long and as much as 250 feet deep and five miles wide, runs diagonally across central Minnesota from Browns Valley through Mankato to Minneapolis. This gash cuts through young glacial materials, older marine and terrestrial deposits, and into ancient heat-borne stone. It exposes some of the world's oldest known rocks. Across its floor flows a relatively diminutive silt-laden, meandering river. The valley and river, as the state, is known as the Minnesota – "cloudy waters." – Constance Jefferson Sansome



The Minnesota River valley is truly the most striking and scenic feature of all south-central Minnesota. It is a narrow sliver of wooded hill slopes in the vast plains to north and south, and it holds within it a diversity of geologic features such as rugged granite knobs on the valley floor, boulder-gravel river bars, broad sandy terraces, gentle colluvial slopes – and a stream along the axis that is almost tiny in context of these major features. – H.E. Wright, Jr.

The Dakota called the river Minnesota or *Minnay Sotar* which has been translated a number of different ways. Some say it means "smoky-white water" or "like the cloudy sky water," expressing the notion the Minnesota River has always had a somewhat turbid condition – especially downstream of its confluence with the Blue Earth River. The French named it *Riviere St. Pierre* and then it became known as St. Peter's River by early trappers and traders.

Some of the earliest explorers like Jonathan Carver, Joseph Nicollet and George W. Featherstonhaugh filled their journals with entries of both transparent and turbid waters, riverbanks of white sands, extensive wild rice beds, and abundant wildlife.

From the brink of this prairie I had a fine view of the river and the country around. The stream had a graceful serpentine course, and the trees on its left bank were beautifully distributed in natural clumps and lines, and everything assisted in the perfect and general embellishment of the scene; even the uninterrupted solitude of the full enjoyment. – George W. Featherstonhaugh, "Canoe Voyage up the Minnay Sotar"

American and European settlers started to push into the Minnesota River Valley after the signing of the Traverse des Sioux Treaty in 1851. From that time on this landscape filled by native prairie, wetlands and shallow lakes began its transformation into one the most productive agriculture regions in the world. Today over 92 percent of the land-use tied to primarily corn and soybean crop rotation and livestock production.

All of this alteration including the construction of cities, roads and other infrastructure changed the Minnesota River in ways not fully understood until people started to notice the water quality problems of our rivers and declining aquatic and terrestrial life. By the 1980s, the river was increasingly being described in a degraded condition – algal blooms, unhealthy fish populations, murky waters, excessive nutrients, bacteria and sediment, not able to support aquatic life and recreation, etc.

If Featherstonhaugh were alive today, he would find a different river. Once clear waters are murky and brown. White sand bottoms have turned to mud. Streambanks are eroded and bare. Much of the wildlife are long since gone. Wetlands, which once protected the valley against flooding and erosion have all but disappeared. Soil, pesticides, fertilizers, oil and grease, toxic chemicals, garbage, and septic system wastes have all found their way to the river. – The Minnesota River Reclaim a Legacy handout

On September 22, 1992, Governor Arne Carlson stood on the banks of the Minnesota River in Bloomington holding up a jar of dirty river water and declared it was time to clean up this waterway. "Our goal is that within 10 years, our children will be swimming, fishing, picnicking and recreating at this river," said Governor Carlson.

Carlson's bold statement followed with the completion of a four-year comprehensive study of the Minnesota River Basin. The report issued in January of 1994 stated, *The Minnesota River is one of the state's most highly polluted waters, particularly from nonpoint sources of pollution.* Recommendations were brought forward by this study and later through the "Working Together: A Plan to Restore the Minnesota River" by the Minnesota Citizens' Advisory Committee.

Governor Arne Carlson's call for action and the concentration of resources by the federal, state and local government, nonprofit entities, farmers and citizens resulted in far-reaching initiatives including the enrollment of over 100,000 acres in the Conservation Reserve Enhancement Program (CREP) and in conservation programs including other efforts involving civic engagement, water quality monitoring, installation of conservation practices, and government action. Many people agree that improving and protecting water quality in the Minnesota River Basin has a lot farther to go but we seem to be on the right track.



Mussel Survey on the Chippewa River





## **Executive Summary**

In December of 1994, the Minnesota River Citizens' Advisory Committee issued "Working Together: A Plan to Restore the Minnesota River" as part of the ongoing effort to improve and protect water quality in the basin. The Minnesota Pollution Control Agency (MPCA) created this citizen's advisory committee to help define reasonable and effective ways to reach established water quality goals.



A group of 30 people including citizens, farmers, business owners, nonprofit and government staff from across the Minnesota River Basin met more than 30 times over a two-and-half year period to gather information on the river, discuss the river's problems and come up with potential solutions. According to the report, they represented the basin's geographical and cultural diversity along with *members from Big Stone Lake to the mouth of the river and representatives from several state and local agencies*.

This committee developed ten recommendations for improving water quality, biodiversity and the natural beauty of the Minnesota River and to help achieve the goal of a fishable and swimmable river by the year 2002:

- Restore floodplains and riparian areas,
- Restore wetlands,
- Manage drainage ditches and storm sewers as tributaries,
- Improve land management practices,
- Monitor water quality throughout the Minnesota River basin,
- Establish a "Minnesota River Commission" to oversee the cleanup effort,
- Establish local joint powers agreements,
- Improve technical assistance to local governments,
- Engage the general public,
- Enforce existing laws.



The Minnesota River Board has been charged by the State Legislature to assess or evaluate the *results and progress of projects in the 12 major watersheds of the Minnesota River Basin* (language from the Minnesota River Board Bill). This report will examine a number of factors including the ten recommendations set forth by the Citizens' Advisory Committee to serve as a reference point to see how far the original members feel the efforts to improve water quality in the basin has come since 1992 when Governor Arne Carlson said, "Our goal is that within 10 years, our children will be swimming, fishing, picnicking and recreating at this river."

The Minnesota River Progress Report is one example of telling the story of what has been happening under the effort to improve and protect water quality in the basin. We will also highlight individual success stories and provide information related to conservation practices, land-use, and water quality data to provide a fuller understanding of what has been accomplished in the Minnesota River Basin over the last twenty-five years. To help evaluate the ten recommendations we surveyed all reachable members of the Minnesota River Citizens' Advisory Committee to give us their perspectives about what has been accomplished and what areas still need improvement. Each committee member ranked the recommendations on a scale from 1 to 6 (1 low and 6 high) and also provided examples of its progress and challenges. Survey excerpts and summarized comments follow:

#### **Recommendations:**

- 1. Restore floodplains and riparian areas 4.2 ranking:
  - What worked: This has probably been the single greatest accomplishment [from the Citizens' Advisory Committee recommendations], principally because of the Conservation Reserve Enhancement Program (CREP). Timing was also critical, following on the heels of large flood events in '93 and '97. Many acres in the floodplain had become unfarmable, making programs such as CREP and Reinvest in Minnesota Resources (RIM) very attractive.



There was a reason this recommendation was number one on the list. It has become more and more culturally unacceptable to farm the floodplains.

- ✓ Lack of success: Originally, the plan called for enrolling 200,000 acres under Conservation Reserve Enhancement Program but only half was completed. There is limited value in restoring floodplain and riparian areas if you don't also address serious hydrologic alterations in the uplands from agricultural drainage and urban development. Anything done in the riparian areas will quickly be overwhelmed by floodwaters consistently reaching the mainstem from the developed uplands. The entire system of land use must be addressed at once if this river is ever going to improve significantly. We have reached a point where opposition to public ownership precludes new or expanded permanent easement-type land retirement programs.
- ✓ Additional progress is needed: More funding for programs like CREP targeted in critical areas within a sub-watershed. Much more work is needed to obtain compliance with ordinances requiring a 50 foot setback from public waters. In addition, target the first and second order streams with riparian vegetated cover. Tackle hydrology issues by using riparian areas, water storage, etc. to temporarily hold water to decrease the energy in the system and reduce sediment transport.

## 2. Restore wetlands - 2.8 ranking:

- ✓ What worked: There are some wetlands restored through RIM, Wetlands Reserve Program (WRP) and CREP, although it is still a small amount compared to the amount drained.
- ✓ Lack of success: Until we address drainage as a fundamental root cause of poor water quality, we will not see an improvement in water quality. Non-floodplain

wetlands are hard to get restored because of the valuable cropland needed in the restoration.

✓ Additional progress is needed: Reducing the volume of water during runoff events (rain, snowmelt) is the number one challenge facing the Minnesota River. Wetland restoration needs to be a big part of the solution. We need to significantly increase the percentage of land that is wetland. What is needed is a serious initiative to restore large complexes, including drained lake basins, throughout the basin.

## 3. Manage drainage ditches and storm sewers as tributaries - 2.9 ranking:

- ✓ What worked: There seems to be some awareness that ditches and storm sewers are part of the tributary system, thanks to education efforts. A Board of Water and Soil Resources (BWSR) study looking at buffers on ditches identified many of the county ditches have a one-rod buffer. The only progress on this front is through the state's regulatory program for major cities NPDES permitting [National Pollutant Discharge Elimination System]. Storm sewers are getting a lot of attention these days through stepped up management by cities and citizen involvement by the Friends of the Minnesota Valley, which has helped raise awareness and created measurable reductions in phosphorus from community storm water.
- ✓ Lack of success: The point here was to make landowners accountable for the quality of water that left their property and to hold them to water quality standards. Much more needs to be done. Participation varies greatly from county to county, ranging from very high to almost no buffers in some areas. There has been a lot of attention given to this area of research but little implementation on a large scale. Politically, it is not possible to manage drainage ditches in any way other than what we are seeing. With respect to public drainage ditches, this seems like an untenable proposition and not worthy of pursuing at this time.



Additional progress is needed:
It may be that some of the emphasis on "two-stage ditches" and similar technologies will lead to improved ditch management over time. The education process needs to continue, especially with regard to tile. The BWSR ditch study identified that there is still a need for buffers in some areas. In critical areas the one-rod buffer is insufficient for water quality protection.

## 4. Improve land management practices - 3.8 ranking

- What worked: Respondents gave this a fairly high rating owing mostly to the widespread adoption of conservation tillage, reduced tillage, and no tillage management across most of the Basin. The change is very noticeable compared to conditions in the early 1990's. The results are very noticeable as well. There are fewer blackened snowdrifts in winter, there seems to be a lot fewer rills and gullies following rainstorms, and fewer instances of dust storms. I think one of the most effective concepts is the "farm the best, buffer the rest" slogan. Encouraging producers to enroll marginally producing land in the various setaside programs seems to be a win/win undertaking. These marginal lands often are in or near riparian corridors, making them all the more valuable from a water-quality perspective.
- ✓ Lack of success: Cropping systems have not changed over the years; it is still predominantly corn and soybeans. For example, in the agricultural areas, we are still farming corn and soybeans the way we are because of farm commodity payment schemes. In urban areas, we continue to plan far-flung, low-density communities because the price of oil has been and remains artificially cheap.
- ✓ Additional progress is needed: We need fundamental reforms in the national farm legislation if we are ever to get away from the destructive effects of cornsoybeans rotations. Local zoning could address poor urban/suburban development plans. More attention is needed to inventory priority management areas within the basin, watersheds, and sub-watersheds so that resources can be directed toward landscapes that are most critical. A gradual introduction of regulatory controls would also be helpful.



Breaking drainage tile for a wetland restoration in Hawk Creek Watershed

- 5. Monitoring water quality throughout the Minnesota River Basin 4.6 ranking
  - ✓ What worked: This continues to be a very successful activity across the basin, yielding data that can be used to influence decisions leading to changes on the landscape. The data has also been valuable in evaluating change over time. The mainstem, major tributaries, and selected tributaries are now being monitored using consistent methodologies across the basin, with the data collected into a central data base (MRBDC) at the MSUM Water Resources Center. Much more data is available in an easy to understand format with it being analyzed and interpreted. *The State of the Minnesota River* Water Quality Monitoring Reports are an example of this.

- ✓ Lack of success: It will be difficult to sustain the level of monitoring we have been accustomed to, but it may also become more important owing to growing demands for measuring the results of the range of Best Management Practices (BMPs) being promoted and installed across the basin.
- ✓ Additional progress is needed: Monitoring will need to be applied at smaller and smaller scales as we move our work to the Priority Management Zones. We will need to determine whether BMPs are effective at that scale. It is important to make sure the monitoring results and dissemination of findings from the major and minor tributaries get reported back to the people who live in the respective watersheds. There is a need for a single website that provides access to all the monitoring data. As the Citizens' Advisory Committee report states, we need to know where we are now, what effect our cleanup efforts are having, and when we have reached our goals.

## 6. Establish a "Minnesota River Commission" to oversee the cleanup effort - 2.7 ranking:

- ✓ What worked: The Minnesota River Board (MRB) went a long way toward this. The MRB was created as an alternative to the Commission. Adding a technical advisory committee is a good step.
- ✓ Lack of success: Success of the MRB has been limited by the nature of its charter. MRB is good but a broader representation would enrich the group. There are groups that do not have representation on the Minnesota River Board. The MRB does not really oversee the cleanup efforts.
- ✓ Additional progress is needed: Strengthening the resolve of the MRB to enact policies and promote actions that may, at times, be unpopular could lead to more effective results. Communication among the myriad stakeholders remains spotty at best, limiting the ability of the stakeholders to collaborate.

Senator Dennis Fredrickson and Representative Terry Morrow speaking at a Minnesota River Board meeting in Gaylord.



## 7. Establish local joint powers agreements - 3.6 ranking:

- ✓ What worked: There are a great many boards and organizations functioning within the basin. Not all are joint powers based, but that doesn't limit their productivity. Groups of this nature play an important role in focusing attention on major watersheds and offer an easy access point for local residents.
- ✓ Lack of success: There is a lot of concern about the financial viability and credibility.
- ✓ Additional progress is needed: Some form of local funding needs to be developed to alleviate near total reliance on state, federal and foundation grants. All the major watersheds need to have a focused organization that people can call to discuss implementation issues.

## 8. Improve technical assistance to local governments - 3.6 ranking:

- What worked: The state provides financial and technical services to local government to help build local capacity to enact land use changes to restore water quality. The MPCA has done a good job providing local governments with technical guidance regarding their stream monitoring efforts, standardizing methods and providing technical training.
- ✓ Lack of success: We may be seeing a decline in the level of technical assistance from its peak in the late 1990s due to chronic state and local budget shortfalls. There have been no real changes over the past 10 to 15 years. Budgets have limited almost all staff growth. Once local capacity begins to erode (which is beginning to happen) we will have a very difficult time restoring it.



## 9. Engage the general public – 3.7 ranking:

- ✓ What worked: This was and is a good idea. Much work has been done to try to engage the public. They should get an A for effort. We have seen steady progress in recent years on this recommendation, and we expect to see more in the years to come. This has arisen as a consequence of many longtime, dedicated people living and working in the basin that have simply not given up. Nonprofit organizations in cooperation with government agencies have done an outstanding job here.
- ✓ Lack of success: There is so much more that needs to be done to encourage true civic engagement not just citizen consultation. It's hard to have a sense of urgency when people are not connected to the river. We could do a better job on the social side of things. Most of the focus is technical (acres of BMPs, model results, TMDLs, monitoring). We are only reaching a very small percent of the public. The public is not responding. They seem to be too busy trying to make a living to be engaged or it just isn't high on their priority list.
- ✓ Additional progress is needed: We need to continue to reach out to people at their level of understanding and in ways that are comfortable for them, rather than us. At minimum we need more people "in the field" with social science skills to match the natural science skills already in play. A serious paradigm shift is needed. We need to encourage the development of local citizen leaders that can lead neighbors to change land practices rather than the government doing it. Citizen-led watershed

management is the future. Government should play the role of consultant, supporter, educator at a small and personal scale (Township or smaller). We need to understand that civic engagement is not education. Education is a part of civic engagement, but the two are fundamentally different in their goals. Harnessing the power of the web and creating interactive (Web 2.0) sites would go a long way toward enabling citizens to engage in the process. Agencies need to recognize citizens as equal partners and identify ways to collaborate with the public. Providing funding to citizen-based initiatives through the Clean Water portion of the Legacy Amendment funds would help. Marketing of proven methods for conservation farming, set-aside of marginal lands, application of buffer strips, etc. still needs more effort.

#### 10. Enforce existing laws - 3.2 ranking:

- ✓ What worked: Unsewered communities, regulated MS4 (Municipal Separate Storm Sewer System) communities, and decreased phosphorus discharges by point sources are results of regulatory requirements (especially enforced phosphorus reductions in WWTP permits).
- ✓ Lack of success: Non-compliant septic systems, inadequate buffers, and other issues are still not enforced. Many counties are still allowing farmers to break buffer strip laws.
- ✓ Additional progress is needed: Studies and reports over the last few decades have consistently called for better enforcement of existing laws, rules, and regulations. Yet, as we know, there are many constraints to carrying forward with the recommendation. It would seem that until such time as a majority of local residents demand adherence to the law, we will be left with the sort of lax enforcement we've come to know.



## **MINNESOTA RIVER BASIN**

At ten million acres and covering all or parts of 37 counties in the state and smaller sections of Iowa and South Dakota, the Minnesota River Basin is large and under constant threat of its water resources. The basin starts at the South Dakota border and moves from a mostly rural landscape to a major urban setting at its confluence with the Mississippi River. In between you will find communities of all sizes dominated by cropland along with a few remaining sections of native prairie, forests, wetlands and shallow lakes all connected by the Minnesota River and its many tributaries. Approximately 870,000 people call the Minnesota River Basin home with a vast majority of them living in the Lower Minnesota River Watershed.





## MINNESOTA RIVER BASIN

Organizations across the Minnesota River Basin have formed partnerships to develop basinwide strategies to improve water quality and focus more on public outreach. These partnerships feature nonprofit organizations, government agencies, citizens, landowners, recreational users, farmers and many others all interested in protecting the Minnesota River as a valuable and unique resource.

## 1. Minnesota River Board

Formed in 1995, the Minnesota River Board (MRB) is a joint powers board comprised of 27 counties within the Minnesota River Basin. The mission of this organization is to provide leadership, build partnerships, and support efforts to improve and protect water quality in the Minnesota River Basin. Led by county commissioners, the MRB strives to seek ongoing input from stakeholders across the basin including citizens, nonprofit organizations, and government agencies. The MRB assists in the coordination of cleanup and promotion efforts among the 12 major watersheds: (1).



It advises on the development and use of monitoring and evaluation systems; (2). Conducts public board meetings including an annual forum and watershed tours along with

ongoing information and education programs; and (3). Advises on the development of projects within the basin including the distribution of funding.

One of the MRB's strongest partnerships is with the Minnesota Pollution Control Agency (MPCA). These two entities have worked together to improve water quality through financial support, monitoring assistance, along with conducting workshops, seminars and conferences. Both organizations played key roles in putting on the Minnesota River Summit in 2007 and keep political leaders informed about important issues impacting the Minnesota River Basin.

The MRB has also worked with organizations like the Greater Blue Earth River Basin Alliance to develop and launch the Conservation Marketplace of Minnesota, an ecosystem credit trading program in three watersheds including the Blue Earth River and the middle and lower stretches of the Minnesota River (see page 73). Another important outreach program the MRB is involved with is the annual Shallow Lakes Forum, partnering with the DNR, MPCA, Ducks Unlimited, BWSR and other organizations. 2. MN River Water Resource Professionals Assembly

An assembly sponsored by the Minnesota River Board on October 1, 2009 brought out over 200 people to hear presentations on a variety of basin-related issues, participate in discussions related to those topics and network with other professionals. Held at Jackpot Junction, the group heard from Kevin Bigalke on "Approaches for Effective Watershed Management; Kay Clark and Dave Bucklin on "Partnering Opportunities," an overview of progress since the Minnesota River Assessment Project by Scott Kudelka, along with Matt Drewitz and Larry Gunderson on funding opportunities for conservation practices. Out of this assembly came the formation of a proposed Basin Professionals Advisory Team to provide input about technical matters to the Minnesota River Board.



## 3. Resident Perceptions of the MN River

Minnesota State University Mankato, Minnesota Pollution Control Agency, Friends of the Minnesota Valley and Minnesota River Board partnered to hire St. Cloud State University to conduct a random phone survey of over 4,000 people in the Minnesota River Basin on their perceptions of the basin.

Over 79 percent of the callers participated with 673 adults being interviewed. Eighty percent of the respondents felt the Minnesota River was somewhat or very polluted. Over 80 percent of the respondents said it will take 5 to 10 or over 10 years to clean up the Minnesota River with 76% saying it should take less than 5 years and 16 percent identifying 5 to 10 years.

In terms of being responsible for protecting water quality for future generations, 96 percent agreed or

strongly agreed with this statement. When it came to willingness to contribute to the clean-up efforts of the Minnesota River, 48 percent said they would be willing to contribute something compared to 35 percent who said no



and 17 percent responded with I don't know.

## 4. Conservation Reserve Enhancement Program (CREP)

As the largest, private-lands conservation effort in the state, the Conservation Reserve Enhancement Program

(CREP) brought together local, state, and federal officials, conservation groups, and interested landowners to work collectively to restore critical floodplain areas in the Minnesota River basin. Over 100,000 acres with more than half being wetland restorations were



enrolled into permanent easements over a four year period, officially ending in September of 2002.

CREP combined the U.S. Department of Agriculture's Conservation Reserve Program (CRP) with the state's Reinvest in Minnesota Resources Program (RIM) to set aside environmentally sensitive land in the 37 county Minnesota River Basin for natural resource benefits including water quality improvements, soil erosion prevention and wildlife habitat benefits.

Facts on CREP: 2,456 easements, average easement size: 41 acres, median easement size: 24 acres, 45,296 riparian acres, 54,495 wetland restoration acres and 673 marginal pasture acres.



## 5. CREP Land Stewardship Project

This educational assistance campaign informed landowners about proper land management practices and opportunities to implement them in the Minnesota River Basin. Sponsored by the Minnesota Association of Soil and Water Conservation Districts, Minnesota River Board, BWSR, NRCS, and DNR, the project hired three foresters to provide technical assistance to help private landowners design riparian buffer plantings to reduce sedimentation and nutrient loading into the Minnesota River and its tributaries. Forest Stewardship Plans were prepared to give landowners information needed to make ecologically sound management decisions. These foresters helped prepare 26 stewardship plans covering more than 3,000 acres; technical assistance on tree plantings for over 7,590 acres of riparian buffers and 1,608 acres of timber stand improvements of non-CREP acres within the basin, technical assistance for livestock exclusion on 290 acres of forests and riparian areas, and to improve wildlife habitat and water quality on 1,150 acres of non-CREP land.

## 6. Minnesota River Integrated Study

The U.S. Army Corps of Engineers (Corps), St. Paul District recently received an appropriation of \$350,000

from the U.S. Congress to launch an integrated study of the Minnesota River Basin. Depending on continual funding from Congress, this study is estimated to cost \$8.4



million over a four year period. Models will be developed utilizing both new and old data to provide a guide how best to meet water quality goals.

In order to create effective models, the Corps will be partnering with organizations like the Minnesota Environmental Quality Board and the State of Minnesota, who will be providing aerial reconnaissance data to be used to develop a detailed, topographical analysis of the basin and land-use practices. The Corps also plan to work with the Minnesota River Board to help coordinate the work.

According to the Corps, these tools will enable examination of existing conditions, forecasting of future conditions and simulation of alternative to identify ecologically sustaining and economically and socially desirable management actions. The system will address watershed, water quality and ecosystem restoration needs at the minor and major watershed scales.



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## 7. Minnesota Elevation Mapping Project

The goal of this project to develop and deliver a seamless high-accuracy digital elevation map of the State of Minnesota including the Minnesota River Basin to better manage resources, provide decision-makers with more

accurate information, and to facilitate the flow of data among all levels of government from local, state and, federal agencies. Accurate topographic information will greatly enhance the ability of decision makers and resource managers to understand how water interacts with the landscape and provides the



foundation for developing innovative, effective, and defendable resource management strategies.

Data will be collected to FEMA flood plain mapping standards to support integration with existing data and generation of two foot contours. For the first phase of the project a set of counties will take part in the mapping including Brown, Chippewa, Cottonwood, Douglas, Faribault, Jackson, Kandiyohi, Lac qui Parle, Le Sueur, Lincoln, Lyon, Martin, Murray, Nicollet, Pipestone, Pope, Redwood, Renville, Sibley, Swift, Waseca, Watonwan, and Yellow Medicine.

## 8. Minnesota River Basin Sediment Report

A multi-agency group led by Johns Hopkins University issued a report summarizing current research on



sediment sources in the Minnesota River Basin in August of 2009. The "Identifying Sediment Sources in the Minnesota River" report stated much of the evidence indicates most of the of the sediment entering Lake Pepin comes from the Minnesota River Basin and the rate of the sediment delivery has increased ten-fold over the past 150 years. Primary factors

in the report point to the basin's geological history, climate, and land use. The report cites other findings and also the need for more research. Sponsored by MPCA, other organizations involved in the project included the National Center for Earth-Surface Dynamics, U.S. Geological Survey, Minnesota Geological Survey, Water Resources Center at MSUM, NRCS, University of Minnesota, and Science Museum of MN. Key Findings:

1. Most of the sediment delivered to Lake Pepin comes from the Minnesota River, and the rate of this supply has increased ten-fold over the past 150 years.

2. Some subwatersheds contribute most of the sediment

to the Minnesota River. 3. Sediment sources within tributaries. including those with large sediment yield, are not evenly distributed. 4. In order to direct restoration efforts, it is necessary to determine not only the regions that contribute the most sediment to the Minnesota River, but also the specific location and mechanism by which sediment is introduced.

5. Changes in sediment storage along the Minnesota River influence sediment delivery at the mouth.



## 9. Farmfest's AgriPreneurship Pavilion

A diverse selection of partners come together annually to promote rural and sustainable economic opportunities in the Minnesota River Basin at FarmFest in early August each year. This tent focuses on Sustainable Agriculture, Rural Entrepreneurs and related issues. Visitors to this pavilion can find out about alternative energy, alternative animal farming, conservation development, organic agriculture, orchards, sustainable agriculture and vineyards. One initiative over the last two years has involved promoting conservation drainage. The Agricultural Drainage Management Coalition and AgriDrain Corp. of Iowa, along with the Minnesota Department of Agriculture, the Minnesota River Board, Friends of the Minnesota Valley are key partners in this initiative designed to make the greater public aware of drainage options for producers.

## **10. Water Resources Center**

Based out of Minnesota State University Mankato, the Water Resources Center (WRC) was created in 1987 by biology professor Henry Quade to serve as a regional research center and study water quality. Today, the WRC employees both full-time researchers along with graduate and undergraduate students from a wide



range of departments including: biology, civil engineering, city planning, environmental science and geography to assist with a diverse selection

of research practices. The students receive both academic and practical applications along with a handson experience. The full-time staff manage projects with assistance from the students in wetland assessments, use of global information systems, and analysis of bacterial and sediment pollution. In 2008, the WRC received \$1.2 million to continue its applied research, including water quality monitoring, communication efforts, and civic engagement in the Minnesota River Basin.

## 11. Minnesota River Basin Trends Report

A comprehensive, reader-friendly overview of the Minnesota River Basin was completed in fall 2009 by the Water Resources Center in conjunction with MPCA and other organizations. The report covers the basin's history, land use, demographics, water quality, recreation and emerging trends. Charts, graphics, maps and photos help explain how some parameters have been improving while others are either static or continuing to decline. The report's forward reads, "As you will see, many actions and projects have been put in place to try to understand and improve the water quality across the



basin. Cleaning up the rivers and lakes in the basin is a complex and challenging endeavor that will take time. Some progress has been made and much still needs to be accomplished. Many diverse groups across the basin are working together to improve ecosystem health for future generations." According to the Minnesota River Basin Trends Report, there has been a decrease in phosphorus and

sediment levels, River otters and bald eagles are making a comeback, while mussel numbers remain static, and nitrate levels are a mixed story.

## **12.** Project Spotlight - Minnesota River Experts: An Educational Field Trip Online

A team at the MN State University Mankato WRC will be creating a one-stop online resource for questions and information related to the Minnesota River Basin. The proposed web site will bring together scientists and advocates as experts to cover a wide range of topics – erosion, water quality, improving fish populations, conservation practices and the wildlife that make the

river their home. Visitors to the site will have a chance to take a natural resource journey through the Minnesota River Basin and have their auestions answered by experts in the field with videotaped responses. A committee of agency staff and



citizens will be assembled to come up with a wide range of perspectives to help people understand a complex, diverse Minnesota River Basin. People will be able to access the site through the web and at four public sites across the basin – St. Peter Treaty Site History Center, Ney Nature Center near Henderson, Regional River History Center at New Ulm and the offices of Clean Up the River Environment in Montevideo.

## 13. State of the MN River Water Quality Report

First published in March of 2002, this report assembles data collected by multiple agencies and organizations to present the information that allows for relative



comparison between the mainstem Minnesota River sites as well as the major tributaries in the basin. The report presents water quality data on sediment, phosphorus, nitrogen, bacteria, nitrates in drinking water, pesticides and mercury from most of the major tributaries, four

mainstem sites and a number of minor tributaries. Agencies involved in preparing the report include MPCA, MN Department of Agriculture, and the MSUM Water Resources Center.

## 14. Minnesota River Focus Area

Clean Water Partnership Phase I diagnostic assessments were completed in nine major Minnesota River watersheds through local government partnerships and assistance by the U.S. Geological Survey. The assessments identified priority water quality problems and directed best management practices to specific land areas primarily intended to reduce nonpoint source pollution. The Natural Resource Conservation Service expanded the delivery of the Wetland Reserve Program to improve water quality in these major watersheds by entering into cooperative agreements with the U.S. Fish and Wildlife Service, the Minnesota Waterfowl

Association, and Ducks Unlimited. Over 7,000 acres enrolled in the program within the Minnesota River Basin. Other partners in the project include the National Park Service, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, BWSR, DNR and MPCA.



## 15. Effects of Agricultural Land Retirement

The U. S. Geological Survey and BWSR secured a grant from the Legislative-Citizen Commission on Minnesota Resources (LCCMR) to evaluate the effect of agricultural retirement (set-aside) on stream quality. The research partnership chose three small watersheds with similar landscape features in the Minnesota River Basin with the exception of the amount and location of agricultural setaside land.

Two watersheds – the Chetomba Creek and West Fork Beaver Creek of the Hawk Creek Watershed – have seen dramatic water quality improvement after the implementation of a variety of conservation practices including land retirement. These two sub-watersheds were compared to the South Branch Rush River which hasn't seen the level of Best Management Practices installation

installation.



Results of the study came to a number of conclusions: (1). Increasing Index of Biotic Integrity (IBI) scores with increasing percentage of retired land; (2). Decreasing total nitrogen concentrations with increasing percentage of retired land; (3). Lowest nitrogen and phosphorus concentrations in the sub-basin with the highest retired land percentage and (4). Better correlation of IBI score with percentage of land retired closer to the stream.

## 16. Conservation Drainage Symposiums

In 2008 and 2009 a diverse group of organizations – Clean Up the River Environment (CURE), Coalition for a Clean Minnesota River (CCMR), the Friends of the Minnesota Valley, Minnesota River Watershed Alliance, Minnesota Department of Agriculture, and a Conservation Drainage Coalition held a total of six Conservation Drainage Symposiums across the Minnesota River Basin.

Overall, the goal of the symposiums focused on educating the public about conservation drainage, a relatively new technology for holding water on the land and providing water quality benefits such as reduced levels of nutrients and sediment.

Each symposium highlighted the opportunity to learn about the use of conservation drainage technology



to increase farm profitability while addressing water quality and quantity issues in the Minnesota River Basin. The public events were designed to build relationships among producers, citizens and

government agencies to work toward finding common ground by establishing trust and constructive interaction.

## 17. Fingerprinting Glacial Sediment

The overall goal of this pilot project was to involve the University of Minnesota students in the testing methods to determine the sources of turbidity in the Minnesota River. During the course, the program instructors introduced multiple methods to allow students to apply critical thinking skills and identify the most promising approach. Two choices to determine sources of turbidity in the Minnesota River were looked at -(1). To collect samples and geo-chemically map the entire watershed and (2). Conduct a reference-lake approach, which was determined to be a more economical method. Using the reference-lake approach, students and instructors studied the radionuclide abundance in sediment accumulating naturally in "reference lakes" to determine the best way to integrate the nature of surface erosion over time in small watersheds.

## 18. Minnesota River Sips of History Trail

A coalition of wineries, breweries and historical sites developed and are promoting a "Minnesota River Sips of History Trail" highlighting unique features of the Minnesota River Valley. The trail promotes sustainable agricultural, tourism and the importance of a diversified economic community.



People can visit three wineries – Crofut Family Winery & Vineyard (rural Jordan), Morgan Creek Vineyards (rural New Ulm) and Fieldstone Vineyards (Morgan), two breweries – August Schell Brewing Company (New Ulm) and Brau Brothers Brewing Company (Lucan) and three historical sites – R.D. Hubbard House, Blue Earth County Historical Society Heritage Center (both of Mankato) and the John Lind House (New Ulm) to experience the diversity of the Minnesota River Valley and efforts to showcase locally owned businesses.

## 19. Organization Spotlight – Minnesota River Watershed Alliance

A network of citizens, nonprofit organizations and government agencies, the Minnesota River Watershed Alliance (Watershed Alliance) communicates the benefits of an ecologically healthy Minnesota River Watershed to others and who actively work towards its improvement and protection. The Watershed Alliance is a loosely organized action-oriented group of watershed advocates that meets four times a year.

Every year the Watershed Alliance picks one action item to focus on. In the past this has included a Conservation Lands Easement Initiative to permanently protect critically sensitive land, assisting with putting on the Minnesota River Summit in 2007 and launching the



MN River Paddler Program that rewards people who paddle rivers in the Minnesota River Basin with a patch or decal as a positive way to connect people to this valuable resource. The Watershed Alliance has also been involved with communication initiatives – a weekly update, quarterly

newsletter and bi-weekly newspaper column all focusing on the Minnesota River Basin.

## 20. Minnesota River Celebration

Over 175 people gathered at the Mankato Hilton in September of 2008 to talk about issues related to the Minnesota River Basin and see a presentation by Tim

Krohn and John Cross of the *Mankato Free Press*. Tim and John paddled down the entire length of the Minnesota River – 335 miles – from Big Stone to Fort Snelling. People packed in to hear them talk about their experiences and see incredible photos



of their adventure during three presentations. A number of tables were set up with people talking about riverrelated issues including Lawnscaping and Water Quality, Saving the Granite Outcroppings, Citizen Efforts and Monitoring, and Fishing and Recreation Opportunities. Other adventures, Sean Bloomfield and Colton Witte were there to discuss their drip from Chaska to the Hudson Bay.

## 21. Chaska to York Factory in Forty-Nine Days

Two high school teenagers started out on April 28, 2008 as snowflakes blew in the air to paddle from Chaska to the York Factory on the Hudson Bay in Manitoba Canada. Colton Witte and Sean Bloomfield paddled 49 days up the Minnesota River, down the Red River of the North, across the massive Lake Winnipeg and through some amazing whitewater rivers on a 2,250 mile journey. They retraced the same canoe trip that Eric Sevareid and Walter Port took in 1930 starting at Fort Snelling and ending up in the same place. Witte and Bloomfield like many Minnesotans had read Sevareid's book "Canoeing with the Cree" and inspiration became reality. Along the way they were helped by people all over the Minnesota River Basin with food, notes of encouragement and even a ride to help portage their canoe. After the journey, Sean and Colton made presentations on their incredible journey all over the basin including the Twin Cities, Montevideo, New Ulm and St. Peter.



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#### 22. Voyage down the Minnesota River

Tim Krohn and John Cross of the *Mankato Free Press* newspaper paddled the entire length of the Minnesota River in 1998 to see first-hand what was happening with the river after the initial push to improve water quality. The two men wrote a series of articles on their 11-day trip covering a wide range of topics and opinions about the status of the Minnesota River.

On the 10<sup>th</sup> anniversary of their initial journey, Krohn and Cross paddled the 335 miles of the Minnesota River and again produced 11 days of stories for the

Mankato Free Press. On this trip the two men were able to compare what they saw on both paddles to get a better understanding of how the Minnesota River and its surrounding landscape has changed both in positive and negative terms.



After their 2008 trip, Tim Krohn and John Cross made numerous presentations across the basin highlighting their unique observations of the Minnesota River.

#### 23. Minnesota River Summit

On January 10 and 11, 2007, over 180 people from a diverse selection of backgrounds gathered for an extended conversation on how to build a more powerful and collaborative effort to protect and improve all facets of the Minnesota River Basin. An interactive discussion took place over the day and half between participants representing agriculture, business, tribal, local, state and federal government, education, nonprofit organizations, watershed projects, elected officials and individuals.

One member from each of the different groups sat together to take part in an ongoing conversation on how build new networks and brainstorm how to



improve water quality in the Minnesota River Basin. Out of this positive atmosphere the group identified a number of critical issues and trends facing the basin: Hydrology – water supply and demand; Population Changes – sprawl and

uncontrolled development; Energy Issues – ethanol and biofuels; The Farm Bill; and Lack of responsibility – leadership. **River Advocate – Senator Dennis Fredrickson** Senator Dennis Fredrickson of New Ulm has served in

the Minnesota Senate since 1980 and been an advocate for the Minnesota River including the efforts to restore and protect this valuable resource. Senator Fredrickson has also been a champion of the Clean Water, Land and Cultural Legacy Amendment and serves on the Legislative – Citizen Commission on Minnesota Resources (LCCMR).

Senator Fredrickson has been a champion of the Minnesota River including water quality efforts and

improving recreational opportunities. He helped designate a number of MN Water Trails in the basin including on the Redwood and Cottonwood Rivers. As a long-time advocate of the environment, Senator Fredrickson has received many awards – Minnesota Center for Environmental Advocacy's Long Portage Award and the Nature Conservancy's Government Relations Award. Here are a few reflections from Senator Fredrickson about the Minnesota River: *Citizen involvement is especially important in cleaning up non*-

point pollution. People get involved when it is an issue about which they care. Activities that get people to the river like canoeing or boating, fishing, enjoying a multitude of activities with friends by the river remind people that they don't have to travel "up north" to enjoy our water resources. Community events like River Blast, river clean-up days, and canoeing flotillas bring people to the river which builds support for enhancing water quality.



An excellent place to start engaging citizens with the river is youth activities. The activities can be entirely recreational, or they may be scientific or educational. I have never seen a student stand in water with a seine and not get excited at seeing for the first time the small critters living in the water. Curiosity leads them to wonder why they find few riffle beetles but many pouch snails for example. The answer helps them understand water pollution and how human activity affects the river.

## 24. Native Plant Communities and Rare Species of the Minnesota River Valley Counties

The DNR's Minnesota County Biological Survey focused on 17 counties bordering the Minnesota River to pull



together information on the geological history, presettlement vegetation, current vegetation, rare plants and animals (mammals, birds, reptiles and amphibians, fish, and freshwater mussels). The report also covers a complete county by county checklist of vascular plants for the region. Surveys of the MN River Valley

began in 1990 and wrapped up ten years later.

## 25. Working Together for the Minnesota River

A diverse group of partners in the Minnesota River Basin have come together to produce a video documentary and create a data clearinghouse and interactive website to accelerate the cleanup of the Minnesota River. This ground-breaking project has been endorsed and supported by a wide range of partners: Friends of the

Minnesota Valley, Coalition for a Clean Minnesota River (CCMR), Clean Up the River Environment (CURE), Water Resources Center at MSUM, Minnesota River Watershed Alliance, MPCA, U.S. Geological Survey and the High Island Creek and Rush River Watershed Implementation Projects.

A one-hour documentary, produced in collaboration with Ron Schara Productions, will air on KARE 11 television in late summer or

fall 2010. The documentary will cover the geological history of the river (depicted in a state-of-the art computer animation) and cultural history of the basin from the earliest inhabitants through the development of large-scale agriculture and urban centers. Part of the documentary will cover water quality issues, successful conservation stories and the history of civic engagement.

Working Together for the Minnesota River: Collaboration Through Communication will also develop a comprehensive website to bring more attention to the Minnesota River and work to inspire the public to continue restoration efforts. This website will become a gateway for citizens, academic institutions, nonprofit organizations, government agencies, businesses, and natural resource professionals interested in the Minnesota River Basin to communicate, share information and develop ongoing partnerships.



## 26. Minnesota River Valley National Scenic Byway

From the South Dakota border near Browns Valley all the way down to Belle Plaine, the Minnesota River National Scenic Byway (MRVSB) promotes the diversity of attractions, communities and recreational opportunities found in the Minnesota River Basin. The Byway focuses on three themes: Agricultural – "Food for

> a Nation," "A River Legacy" – natural history and beauty of the valley, and "Struggles for a Home" – the history and tradition of people who have lived here.

The Minnesota River Valley National Scenic Byway Alliance is made up organizations, agencies and citizens working together to highlight what is happening in the Byway. Alliance members have led the effort on a variety of projects including hosting the 2008 Minnesota Scenic Byway

Workshop in Montevideo, developing and producing a series of interpretive panels marking significant discovery sites along the Minnesota River, and releasing a 20-minute Scenic Byway DVD. The Alliance has also looked at a National Heritage Area designation for the

Minnesota River Valley.





## 27. Wetland Restoration Program

A local, state and federal partnership brings together two easement programs to restore wetlands on privately owned lands. The state's Reinvest in Minnesota (RIM) Program leverages federal funds through the Federal Farm Bill with the Wetlands Reserve Program (WRP). This valuable partnership offers competitive payment rates for landowners to restore wetlands that have been drained with a history of being cropped.

Funding comes from the Natural Resources Conservation Service (NRCS) and the Minnesota Board of Water and Soil Resources (BWSR). Priority for the



program is given to those areas that have experienced the greatest wetland losses like the Minnesota River Basin, which has seen over 90 percent of it original wetlands drained or filled.

According to BWSR, restoring wetlands on privately owned lands provides many public benefits including enhancing wildlife habitat, improving water quality and reducing potential flood damage in targeted areas. In the Minnesota River Basin over 12,200 acres (154 contracts) have enrolled into the program.

## 28. CRP Riparian Permanent Easement Program

The Minnesota Board of Water and Soil Resources (BWSR) began to offer a new conservation easement option called the RIM reserve Clean Water Fund Riparian Buffer program. Any land enrolled in the federal USDA Conservation Reserve Program (CRP) along a waterway can be permanently protected with a conservation easement. Landowners receive a competitive payment

rate to establish native vegetation buffers along lakes, streams and ditches of no less than 50 feet and no more than 100 feet. Over 623 acres our of 73 contracts have been enrolled into this permanent easement program in the Minnesota River Basin. Monies for the program come from the Minnesota Clean Water Fund. This conservation program received the 2009 Partnership of the Year award from the Minnesota Environmental Initiative.

## 29. Wastewater Treatment Plants

In the Minnesota River Basin hundreds of millions of dollars have been invested to upgrade wastewater treatment plants, concentrating on reducing the discharge of phosphorus into waterways. A Phosphorus General Permit was developed by the State of Minnesota in 2005 to reduce phosphorus discharged by point sources including 47 of the 152 permitted municipal and industrial wastewater treatment facilities. These facilities were given the choice of upgrading their systems or purchasing trading credits to meet the water quality-based effluent limits. Facilities across the basin have build new or upgraded their current systems with 47 meeting the 2010 limits ahead of schedule.



One of the new wastewater treatment facilities was built by the City of Willmar to meet the new regulatory requirements and meet the projected growth over the next 20 years. The \$86.2 million project includes the construction of a new wastewater treatment facility and conveyance system that replaces the city's aging and outdated wastewater treatment process with emerging treatment technology to protect the Minnesota River. Phosphorus discharge will be reduced from 9 milligrams per liter to less than 1, the current State standard.



## Minnesota River Watershed Conservation Practices

## **Best Management Practices**

A diverse selection of government agencies, watershed projects and nonprofit organizations offer technical assistance and cost-share for a wide variety of conservation practices to help improve water quality by holding both soil and nutrients on the landscape. The following charts illustrate Best Management Practices (BMPs) recorded in the Minnesota River Basin from 1997 to 2008. Data Source: the Board of Water and Soil Resources (BWSR) LARS (Local Government Annual Reporting System) 1997-2002 and eLINK reporting system (2003-2008). The number of BMPs in the chart reflect only the actual contract for the BMP and not the acres contained in that BMP or other BMPs installed in the basin but not recorded in either of these two programs.



Wind Erosion - practices that prevent the movement of soil by wind including cover crops and

Well Sealing - sealing of abandoned wells to prevent groundwater contamination.

#### Stream/Ditch Bank Stabilization

- using materials like rip rap, willow cuttings, rock weirs, etc to stabilize the banks of streams and ditches.

Sheet/Rill Ephemeral Control prevents soil erosion through practices like crop rotation, grass waterways, critical area plantings, contour buffer strips, etc.

Gully Stabilization - practices include terraces, diversions, water and sediment control basins. etc.

Filter Strip Projects - planting of native grasses, trees and other plants to act as a buffer along

Feedlot Pollution Reduction the use of waste storage facility. composting facility, nutrient

Other - this included categories labeled education, existing public road, agricultural development, mulching, etc.

## **Minnesota River Watershed Conservation Practices**





## Minnesota River Watershed Water Quality

Water quality data have been collected throughout the Minnesota River Basin during the past thirty years and studies 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. Researchers have analyzed almost thirty years worth of water quality data from the Minnesota River at Jordan and Fort Snelling. Trend analyses indicated increasing nitrate-N concentrations in the last ten years. Decreasing trends in total suspended solids and total phosphorus were found over the entire period.

## Total Suspended Solids 2000-2008



## **Total Suspended Solids (TSS)**

The transport of sediment is a natural function of rivers. Modification of the landscape has accelerated the rate of erosion of soil into waterways. Increased runoff has resulted in stream bank erosion. Elevated sediment (suspended soil particles) has many impacts. It makes rivers look muddy, affecting aesthetics and swimming. Sediment carries nutrients, pesticides, and other chemicals into the river that may impact fish and wildlife species. Sedimentation can restrict the areas where fish spawn, limit biological diversity, and keep river water cloudy, reducing the potential for growth of beneficial plant species.

For a five year period starting in 2002, the TSS load was 1.8 million tons at Judson and 5.4 million tons at St. Peter, a 300% increase. Nearly all of the increased load can be attributed to the TSS supply from the Blue Earth and Le Sueur rivers, which discharge into the Minnesota between the two gauges. The 2002-2006 TSS load of these rivers was measured at 3.2 million tons. (Wilcock, 2009)

## Phosphorus

Phosphorus-enriched streams are commonplace in the Minnesota River Basin. Phosphorus stimulates the growth of algae and elevated phosphorus concentrations often lead to eutrophication, which is characterized by undesirably high levels of algal growth. An overabundance of algae and sediment contributes to increased turbidity and reduced light penetration. Water clarity is greatly reduced under these conditions, impairing recreational use and aesthetics of the river environment.

Total Phosphorus (TP) concentrations in the tributaries show substantial variation across the Basin. During 2000 to 2008, the median TP concentration in the Minnesota River mainstem reach from Judson to Fort Snelling was 0.31 mg/L. Concentrations in the major tributary streams show excessive leaves of TP leading to high levels in the mainstem.

## Total Phosphorus 2000-2008

Average Flow-Weighted Mean Concentrations in milligrams per liter



#### Nitrate-nitrogen

Nitrate-nitrogen is important because it is biologically available and is the most abundant form of nitrogen in the Minnesota River Basin streams. Like phosphorus, nitrate can stimulate excessive and undesirable levels of algal growth in waterbodies. In recent years, this problem has been particularly severe in the Gulf of Mexico where development of a hypoxia zone (low oxygen levels) has been linked to excessive amounts of nitrate carried to the Gulf by the Mississippi River.

The watersheds shown in orange and red on the map have concentrations that exceed the drinking water standard (10 mg/L). Most of the nitrate in the Minnesota River comes from agricultural drainage. The highest concentrations in the basin are found in the Greater Blue Earth River (Blue Earth, Watonwan and Le Sueur), Cottonwood River Watershed, High Island Creek Watershed and the highest in the Rush River Watershed.

## Total Nitrate-Nitrogen 2000-2008

Average Flow-Weighted Mean Concentrations in milligrams per liter



## E. coli Bacteria Summer Concentrations

E. coli Bacteria Geometric Means in colony forming units per 100 milliliters (cfu/100 ml) for sites with at least 20 samples 2001-2008



#### E. coli

Disease-causing organisms (pathogens) in water bodies are difficult to measure, so indicators like *E. coli* bacteria are used to illustrate the likelihood that a water body contains pathogens. Although viruses and protozoa cause many of the illnesses associated with swimming in polluted water, monitoring for *E. coli* will tend to indicate fecal contamination.

In the Minnesota River Basin, streams monitored for *E. coli* are often to exceed water quality standards. *E. coli* levels are elevated across the entire Minnesota River Basin with over 90 percent of monitored streams exceeding health standards (126 cfu/100 ml for *E. Coli*). Data show the highest concentrations in the eastern portion of the Basin. Many streams require a 80 to 90 percent reduction in bacteria levels to meet standards. Many of the rivers and streams across the basin have been listed as "impaired waters" and not suitable for swimming because they exceed water quality standards for bacteria.

## Minnesota River Watershed Land Use

Row crop agriculture is the predominant land use in the basin. The Minnesota River Basin consists of 10.85 million acres (9.5 million acres within Minnesota). In 1992, there were 8.52 million acres of agricultural land (78.6%) and ten years later showed a slight reduction to 8.46 million acres (78%). Other land uses are classified as grassland/shrub, urban, wetlands, open water, forest, and barren land. Notable changes in land use from 1992-2001 includes a slight decrease in agricultural lands and an increase in wetlands, open water, and urban lands. The amount of land in crops remained relatively stable over the same time period.

Early explorers' accounts and paintings provide glimpses of what the landscape resembled before widespread European settlement. Many explorers wrote descriptions about the rich flora and fauna, describing a landscape covered in tall grass, wetlands, shallow lakes and forested areas.



## LOWER MINNESOTA RIVER WATERSHED

As the most populated major watershed in the Minnesota River Basin with over 500,000 people, the Lower Minnesota River Watershed is a mixture of urban, suburban and rural areas. The watershed starts out in the western end dominated by agriculture and small communities before transforming into a major metropolitan region with a mixture of industry and the Minnesota River Valley National Wildlife Refuge along the river channel. This type of geographic diversity is not found anywhere else in the basin. Today, the rapidly growing and changing watershed is vulnerable to urban sprawl, increased stormwater runoff, invasive species, sand and gravel mining, plus the loss of cropland and natural areas to ongoing development pressures.





The final 15 miles of the Minnesota River remain isolated from the world in spite of being amid a major metropolitan area. White egrets, bald eagles, great blue heron and a doe with her fawn on the river bank were still present, if not as great of numbers as farther upstream. Still, it's easy to know you are no longer on a rural river. – Tim Krohn, July 16, 2008

## LOWER MINNESOTA RIVER WATERSHED

Projects involving improving water quality in the Lower Minnesota Watershed have been undertaken by Soil and Water Conservation Districts, Watershed Districts, Clean Water Partnerships, state agencies, nonprofit organizations, landowners, and individual citizens. Projects have ranged from protecting unique natural features to city cleanups, to restoring wetlands, to a variety of conservation practices and transforming an individual's farming operation.

## 1. Nine Mile Creek Watershed District

As the first urban watershed district (1959) formed in Minnesota, Nine Mile Creek was awarded DNR's Watershed District of the Year in 2009 for its innovative approaches to improve water quality, their extensive public input processes, robust education and outreach programs, and their efforts to work with the DNR on legislative issues.

One major project of the District involves remeandering or re-channeling approximately 8,500 feet of the creek in the city of Hopkins to stabilize the



steambanks, its natural habitat and make it more suitable for fish and wildlife. The ambitious \$4.5 million project will transform this "glorified drainage ditch" that had been

straightened in the 1960s and 70s back to its original meandering channel to stop erosion and make it more attractive to fish and wildlife. By adding curves and stones to the stream bottom, the District hopes to slow down water letting sediment settle out of the current and inject more oxygen into it. This type of channel restoration work may expand into Edina.

In the Bloomington section of Nine Mile Creek, the city has began to stabilize the bank by adding rip-rap in some places and putting in rock veins boulders placed at strategic angles in the water to direct flow to the center of the creek, away from the banks and edges of walking trails.

Nine Mile Creek Watershed District offers costshare grants to residents, corporations and local governments in Eden Prairie, Minnetonka, Edina, Richfield and Hopkins to install stormwater and water quality improvement measures. Eligible projects include rain gardens, porous asphalt and pavers, green roofs, cisterns and restoring stream banks and shorelines with native plants.

One such project involves the City of Bloomington working with homeowners to plant large rain gardens to filter storm water runoff before flowing into the Nine Mile Creek. Cuts in the curb system will direct this runoff from streets, yards and buildings allowing water to soak into the ground and reduce the volume of flow into Nine Mile Creek.

Other projects implemented by Nine Mile Creek Watershed District include a lake drawdown on Northwest and Southwest Anderson lakes in Eden Prairie conducted to control curly-leaf pondweed and reduce phosphorus-feeding algae blooms. Chemicals were also used on approximately 20 acres to kill off the weeds in NW Anderson Lake and 20 acres in SW Anderson where water remained to kill off the curly leaf pondweed.

In addition, Nine Mile Creek Watershed District constructed water quality and infiltration basins, monitored water quality, and sampled fish. The District also produced a 50<sup>th</sup> anniversary book documenting the history of Nine Mile Creek Watershed.

2. Organization Spotlight: Friends of the MN Valley Formed in 1982 as a nonprofit entity to advocate for the Minnesota River Valley National Wildlife Refuge, the Friends of the Minnesota Valley partner with a wide



range of organizations to improve and protect the lower valley's natural resources. In addition to their city clean-ups and restoration

Leadership in Stewardship.

work, Friends are involved in promoting water level control structures that allow producers to seasonally adjust field water levels depending on the season to either lower it or preserve soil moisture.

In 2010, Friends will be launching a "Community Clean-Ups for Water Quality Toolkit" Project in partnership with the Freshwater Society. This toolkit will feature a set of DVDs and manual explaining the importance of clean-up projects and provide practical information on how communities can conduct their own clean-ups.

Other initiatives involve restoring the old Cedar Avenue Bridge trail connection, publishing the book "Dream Hunter: A National Wildlife Refuge Manager's Memoir" by Ed Crozier and will be working in New Ulm, Le Sueur and Henderson to generate new entrepreneurship business opportunities linked to natural resource conservation.

## 3. Community Clean-ups for Water Quality

Over the last eight years, the Friends of the MN Valley has put on 66 community clean-ups across the Lower Minnesota River Watershed. As a result over 8,400 pounds of phosphorus (equal to 6 million pounds of

oxygen-depleting aquatic growth) and 47,000 pounds of trash have been removed from waterways. Volunteers cleaned up leaves, dirt and other organic materials from city streets to keep it out of storm water systems.



One example is the City of Arlington who has been conducting a month-long effort since 2004 to collect organic debris from all runoff-sensitive areas. This prevented 4,200 pounds of phosphorus and nitrogen from entering surface water.

Another successful event was the Black Dog Earth Clean-up sponsored by Excel Energy saw 32 volunteers haul over 700 large bags of garbage from parking areas, the wildlife observation deck, around Black Dog Lake and part of the Black Dog Road. Items collected included sofa cushions, a television set, a bag filled with eighteen diapers, a metal headboard and a car engine.



## 4. Eagle Creek Riparian Protection

As the last known stream with a self-sustaining trout population in the Metro Area, the DNR, City of Shakopee



and a property developer worked together to protect Eagle Creek with a 200-foot buffer on both sides of the creek's western branch. Thirty-five acres have been

designated as an aquatic management area with an earthen berm or grassy swale built behind houses that diverts storm water from running into the creek protecting the creek and Minnesota River. Eagle Creek Watershed also contains the unique geologic feature, "boiling spring."

## 5. Lower Minnesota River Watershed District

This watershed district was established in 1960 to provide local participation for the construction of a nine foot navigation channel by the U.S. Army Corps of Engineers. Today, the Lower Minnesota River Watershed District continues to be actively involved in the channel's ongoing maintenance.

On the water quality side of its work, the District assisted the DNR in negotiations with property owners to purchase sections of the Seminary Fen site, conducted a gully inventory in the cities of Carver, Chaska, Chanhassen, Eden Prairie and Bloomington with field work

done by the Minnesota Conservation Corps and retrofitting of storm water drainage at the Minnesota River Wildlife Refuge Center in Bloomington by modifying catch basin and adding rain gardens in partnership with the USFWS and the Friends of the Minnesota Valley.

## 6. Slope and Riverbank Erosion Study

The Lower Minnesota River Watershed District hired Wenck & Associates to conduct a study on slope and riverbank erosion issues and develop a plan to protect bluff-top homes overlooking the Minnesota River Valley in Eden Prairie. Structure concerns focus along a 1,200 foot section of the river's north bank and about 540 feet of the bluff face above the water. According to this report, the overall stability of the slope shows that the properties on the bluff are well within the acceptable minimum factor of safety. Over the last few years, the natural erosion process has been accelerated due to numerous factors ranging from increased drainage to climate change. By using historical records and river photos, it has been determined the Minnesota River has cut 115 into its north bank since 1967 at a rate of about three feet a year.

To stabilize the streambank without pushing the problem downstream, Wenck recommended building

about seven bumper-like rock vanes along the river's north bank at a cost of about \$1 million to stop erosion and rebuild the



bank. Strategically placed piles of rock or rock vanes into the current will direct the water flow away from the bank while encouraging sediment to drop out and reinforce the river's edge. To control storm water erosion of the bluff face, Wenck prescribed grading it, planting it with vegetation and conveying storm water down the side of the slope directly into the river with pipes or on a riprap channel. The Lower Minnesota River Watershed Board will select an erosion-control strategy before drawing up engineering plans to determine the cost.



7. Minnesota River Valley National Wildlife Refuge

A \$26 million settlement from the Metropolitan Airports Commission has been used to purchase over 4,000 acres for one of four urban national wildlife refuges, along with the construction of a new visitor center. One 600acre section was acquired within the MN River floodplain near Carver with help from the Friends of the MN Valley and NRCS. The site features five miles of hiking trails. To restore the land back to a more natural landscape, former cropfields have been stripped of tile and drainage systems and seeded to native prairie along with wetland restoration and construction of dikes. Part of the land purchases has focused on waterfowl production areas.

## 8. Long Meadow Lake Drawdown

In fall 2009, the U.S. Fish and Wildlife Service lowered the water level of Long Meadow Lake low enough for



native plants favored by ducks and herons to reestablish themselves. This 1,200 to 1,500 acre lake in the Minnesota River Valley National Wildlife Refuge is a key stop for

waterfowl on their spring and fall migrations. Unfortunately, a variety of native plants diminished after repeated flooding from the Minnesota River, creating water levels too high for some of the plants that ducks like to eat. A new water control structure installed by the U.S. Army Corps of Engineers at the cost of \$805,000 prevents the river from backing up into the lake. A drier than average summer emptied the lake along with help from a Youth Conservation Corps crew that battled dambuilding beavers throughout the summer.

## 9. Seminary Fen

One of only about 500 calcareous fens in the world, 106acres of the Seminary Fen was purchased by the DNR for

\$1.3 million in 2008. Seventy-three acres have been designated as a Scientific Natural Area (SNA), allowing allowing for public access and some limited improvements. Located along Assumption Creek in



Carver County, the DNR, Lower Minnesota River Watershed District and others are working to buy additional land to protect this important natural area, once home to a seminary and before that a sanitarium.

## 10. Scott County Landowner Outreach

Over 200 Best Management Practices (BMPs) have been installed under the Scott County Cost Share and Incentive Project. Started in 2006, the project prevented 5,275 tons of sediment and 7,380 pounds of phosphorus from flowing into lakes, rivers and other waterbodies in Scott County on an annual basis. The main focus of this project is to encourage landowners to make wise stewardship decisions by reducing or removing barriers. Funds were secured from the Scott County Watershed Management Organization and local project participants to supplement state and federal monies. More than \$2.75 million has been leveraged to assist landowners with the installation of conservation practices. The project utilized new scientific information to target those BMPs and areas that would have the most effect on improving water quality in Scott County.

## 11. Sand Creek Watershed

Scott County Watershed Management Organization is conducting a TMDL and impaired waters resource investigation of the Sand Creek Watershed. The purpose of the project is to compile watershed information – land cover, feedlot locations, geomorphology, drained wetland inventories, erosion surveys, collect two years of water quality data, develop water quality models and complete a diagnostic study and implementation plan. The study set the following reductions in order to meet the TMDL or impaired water requirement: 59 percent in sediment and 85 percent in phosphorus.



## 12. Cedar Summit Farm

This family farm located 50 miles southwest of the Twin Cities has quit applying herbicides on their crops and moved to a rotational grazing system with a grasslegume pasture for their dairy cattle. They wanted to cut costs and are proud of the benefits to the environment and community. Surveys by the DNR and other researchers have documented an abundance of frogs, grassland nesting birds, and fish. This family-operation is an organic certified, grass-based creamery.

## 13. Streambank Stabilization Project

Scott Soil and Water Conservation District stabilized a DNR public watercourse with a direct outlet into the Minnesota River. Prior to this stabilization project, the banks had a vertical drop of up to 20 feet, causing a soil loss of about 255 tons and 400 pounds of phosphorus



A series of six weir dams and rock chutes were installed and the banks reshaped, mulched and seeded to grass and stabilized the side slopes on this site that had become unstable and hazardous for farming equipment. Funding was provided by the Metropolitan Environmental Partnership and the Environmental Quality Incentive Program (EQIP) through the Natural Resource Conservation Service (NRCS).

## 14. Habitat Restoration Projects

Monies from the Environmental Trust Fund and the Carl & Verna Schmidt Foundation were used to restore 580 acres of wetland, upland and shallow lake habitat within



the Lower Minnesota River Watershed and some of the Minnesota River Basin. A coalition of partners including Friends of the Minnesota Valley, Le Sueur SWCD and U.S. Fish & Wildlife Service restored Lake Renneberg, a 120 acre

shallow lake drained by a county ditch by installing a variable crest water control structure. Temporary drawdowns of water levels on Lake Renneberg will help stimulate plant germination and invertebrate populations.



## 15. Belle Plaine State Wayside Clean-up

One of the toughest areas for a clean-up project along the Minnesota River is an old salvage area at Belle Plaine filled with large metal objects protruding from or lying in an landscape filled with dense willow thickets, tall grass and nettles, beaver ponds and dams, washed out roads and frequent flooding bringing siltation from the Minnesota River. Less than 10,000 tires remain at this difficult site compared to 300-400,000 that have been removed, and over 135 truckloads of salvage yard scrap. Starting in 1999, the DNR's Adopt-a-River Program has been leading the clean-up effort on the 60 acre site.

On June 7, 2008 – National Trails Day – the DNR and the Minnesota 4-Wheel Drive Association hauled out over 100,000 pounds of rubbish and scrap from the sites' wetlands. Over one-third of the material was shipped to recycling firms, including 227 car and heavy truck tires and metals. Other partners involved in the clean-up were DNR Parks & Recreation, Metropolitan Mosquito Control District and Alter Metal Recyclers.

In October of 2009, 48 club members of the Minnesota 4-Wheel Drive Association brought their 4 x 4 trucks to tackle the debris-laden former auto-parts junkyard with added machine muscle. The trucks were used along with trailers and skid loaders to get at some of the harder items using electric winches to pull heavy objects out of the river silt. More than 100,000 pounds of auto and truck metal and junk were hauled out filling 16 dumpsters. Some of the more interesting objects included fuel-oil tanks and a fiberglass boat embedded in almost a foot of silt. A total of 600 partially buried tires were also pulled out and disposed of by the Metropolitan Mosquito Control District. More tires and scrap will need to be removed to restore and manage this site as a unit of the Minnesota Valley State Recreation Area.



The center is also known as the site where local junior high students discovered a large number of deformed

frogs which helped led to extensive scientific research across the country. Today, college professors and students from local institutions continue to conduct research including a frog-migration

frog-migration project tracking frog movement from wetlands to the river and a Monarch Butterfly Tagging Program. The program is designed to educat



designed to educate families about the monarch butterfly and create an interest in conservation issues.

## 16. Seven Story Farm

A small-scale, diversified enterprise specializing in woody florals, small fruits and nuts, Seven Story Farm is located near Belle Plaine. Grower, Heidi Morlock,

is very concerned about biodiversity on her farm and works to integrate native plants into her marketing and farm plans. Seven Story Farm also showcases an example of an on-site, restored wetland. The farm, along with Rural Advantage and the University of Minnesota Extension sponsored a



"Sustainable Small Farm Experience" to people interested in sustainable agriculture, the small farm, small-scale renewable energy, and much more. Morlock shared her experiences with establishing, managing, and marketing the many diverse features of the farm. Another discussion focused on her experiences with beginning a sheep production and on-farm renewable energy via a wind generator.

## 17. Ney Nature Center

Located a bluff overlooking the Minnesota River Valley near Henderson, this nonprofit, learning center has been offering environmental-related education programs to the public since 1996. The Ney Nature Center consists of a learning center and 450 acres of restored wetlands and native prairie and wooded areas. An additional 300 acres donated by the Ney family is a DNR wildlife management area.

## **18. Henderson Birding Focus**

Civic leaders from the river town of Henderson sponsored a hummingbird count and public event in August of 2009 to draw attention to the importance of the

> Minnesota River Valley to song birds, especially during migration. Staff from the University of Minnesota Extension Service conducted a humming bird banning exercise with help from citizens to track the migration of these birds. Experts were also on hand during "Hummingbird Hurrah, a celebration of everything hummingbird" to answer questions. The Minnesota River Valley is identified as an Important Bird Area, one of only 35 places in Minnesota because it has good habitat – a variety of

trees, cover and water.

The City of Henderson also features Henderson Feathers, a resource center on birds operated as a mini-Minnesota Valley Birding Science Museum. One of the



highlights is an expansive collection of salvaged bird specimens that Art and Barb Straub have collected for years and used for school presentations. To let people see the preserved birds up close, each species is stored in clear plastic storage tubes. The collection also

contains nests, habitat examples and other general information about bird identification.

19. River Advocate Spotlight - Art & Barb Straub Art and Barb Straub chose to live in an apartment instead of a fancy home in order to focus on restoring the 200 acres of wooded and prairie land they own overlooking the Minnesota River near Le Sueur. Owned by the Straub family for over 150 years, it is becoming an island of trees and grasses in an everexpanding sea of development.

As ceaseless educators and good stewards of

the land the Straub's enjoy bringing people of all ages out to their property to get a taste of the natural world and see what the valley was like before being transformed by Euro-American settlement. Over the years they developed an intimate knowledge of the landscape along with an understanding of both the positive and negative.



They take their environmental show on the road, showing off all the artifacts found in the Minnesota River at a wide range of public presentations. For all their conservation efforts, Art and Barb Straub were presented the first-ever Elaine Mellot Award from the Friends of the MN Valley.

## 20. City of Le Sueur

After years of turning its back on the Minnesota River, this community of 4,300 has embraced an effort to do its part improving water quality. In 2006, the Cities of Le Sueur and Henderson joined together to construct a wastewater facility outside the river's floodplain to prevent untreated sewage from being discharged during high water events.



Over the last few vears city-wide cleanups have resulted in the removal of both garbage and phosphorusbearing debris from roadsides and riverbanks and ultimately

keeping it out of the Minnesota River. The City of Le Sueur also changed its street sweeping schedule to remove leaves and soil from the streets before spring rains washed the undesirable material into the storm sewers. Future ideas for improving water quality include moving the city's compost area - a huge potential source of phosphorus pollution, out of the floodplain, along with planning additional parks and trails.

## 21. Illegal Dump Site Cleanups

Many counties across the basin are plagued by illegal dumpsites. In 2006, Sibley County Environmental Services began to tackle the job of cleaning up long-time illegal dump sites, especially those near the Minnesota River Valley. Under a pilot program with Kelso Township, Sibley County cleaned up a 40 to 50 year dump site located in Rush River Watershed. Funded through a solid waste fee placed on real estate taxes by the county,

these illegal dump sites are a serious environmental and community concern. Runoff and leaching of chemicals can contaminate both surface- and ground-water which has an effect on public health, public safety and health of aquatic organisms.

## 22. Jessenland Unit of the Minnesota Valley National Wildlife Refuge

The Minnesota Valley Trust and the U.S. Fish and Wildlife Service worked together to purchase 512 acres in Faxon and Jessenland townships in Sibley County. Frequently flooded cropland will be

restored by planting native grasses and establishing an oak savannah along with breaking tile lines to create a 25

acre wetland restoration. The Trust sees this as an important piece of property to protect critical habitat for wildlife and public enjoyment. Funding came from a number of sources including a Metropolitan Conservation Corridors from the Minnesota Environment and Natural Resources Trust Fund and the Carl and Verna



Schmidt Foundation. The U.S. Fish and Wildlife Service say the land is an integral part of the 7,000-acre restoration of floodplain forest, wetland and bluff habitat along the Minnesota River.

## 23. City of Lafayette Stormwater Project

On August 21, 2009, the City of Lafavette completed a storm drain stenciling project to raise awareness about the link between city storm drain systems and water quality. A water conscious Lafayette citizen by the name of John Paulson headed up the project with assistance from city and watershed staff. A message "No Dumping, Drains to River" with an image of a fish among aquatic plants was stenciled at all the storm water drain openings in the city.



## 24. Lake Titloe Beautification Project

A group of residents, business owners, government staff and others have been working for the last seven years to improve water quality in Lake Titloe, located on the north side of Gaylord. A monitoring project run by Dr. Bryce Hoppie from Minnesota State University Mankato is collecting samples in the Lake Titloe Watershed (3 lake inlets, 2 lake sites and the lake outlet) to help the Lake Titloe Committee get a better understanding of how much water is entering the lake and the level of pollutants including sediment. Part of this effort includes a weather/monitoring station set up in the lake recording real-time measurements including temperature, rainfall, chlorophyll a and total phosphorus.



Efforts to improve the lake's water quality started with a bonded grant from the State of Minnesota to redirect the stormwater draining off Lincoln Avenue away from the lake into a retention pond. Partnering with MSUM, SEH Engineering, Sibley SWCD, Rush River CWP and the DNR, the Lake Titloe Group will assist in the implementation of conservation practices to reduce the amount of pollution entering the lake. Promotion of the practices will range from wetland restorations to sediment holding ponds to rock tile inlets to rain gardens, with three already constructed in the City of Gaylord near the lake.

## 25. Mueller Farm

Landowners in the Rush River Watershed, Mike and Mary Mueller have transformed their farm of mostly cropfields into a native prairie / wetland restoration by embracing the economic benefits of various conservation practices. Over the years they have enrolled their farm land into a diverse selection of federal and state programs (Reinvest in Minnesota, Conservation Reserve Program, Wetland Mitigation Bank Program and Conservation Reserve Enhancement Program).



The wetland restorations have increased the number of waterfowl, pheasants, white-trail deer and other wildlife on their land. The Mueller's understand the importance of agriculture and a need to balance it with wetlands and native prairie to help improve water quality and wildlife habitat. Their ultimate goal is to put most of the land into perpetual conservation easements and had some of their land accepted into the Wetland Reserve Program in 2008. Finally, they hope to see their second farm placed under public ownership to let people enjoy the work they have done.

## 26. Jaus Organic Farm

On land his great-grandfather homesteaded in 1877, Martin and Loretta Jaus run an organic dairy farm in western Sibley County. The Jaus don't use chemicals or genetically modified organisms in their dairy operation and use a rotational grazing system. Their cattle move between 25 paddocks allowing each one to rest for almost a month, allowing the root system to rebuild. A rotational grazing system and diverse crop rotations build up the soil's organic matter on their 410-acre farm.

They have also restored an 11-acre wetland prairie, planted five miles of shelterbelts and enrolled land into the Conservation Reserve Program. The Jaus see their operation benefiting the small family farmer because it shows how you don't need to maintain hundreds of cattle on thousands of acres utilizing chemicals and the need for larger machinery – all which need major capital.

> Martin and Loretta Jaus stand in front of their dairy barn built in 1928



## 27. Rush River Clean Water Partnership (CWP)

As one of the most polluted tributaries to the Minnesota River, Rush River has excessive concentrations of sediment, phosphorus and nitrogen. To help improve its water quality the Rush River Clean Water Partnership (CWP) has helped install/fund close to 200 Best Management Practices since 2006: Cover Crops (2,161 acres), Filter Strips (102 acres), Rock Tile Inlets (127), Slotted Risers (40), Terraces (8), Water & Sediment Control Basins (2), Wetland Restorations (12 acres), Rain Barrels (50), Rain Gardens (1), and Septic System Upgrades (111).

In conjunction with High Island Creek CWP, Rush River CWP puts out the quarterly River Watcher newsletter, held a rock tile inlet field demonstration and hosted three Fecal Coliform Bacteria TMDL public open houses. The Rush River CWP has also put on two small group manure and nutrient management planning workshops, continued the long-term monitoring effort at the Rush River outlet site and hosted a display booth at the annual Sibley County Fair.



**28. High Island Creek Clean Water Partnership (CWP)** This CWP got started in 2001 with a diagnostic study of this 153,000 acre watershed. Spread out across the counties of Sibley, Renville and McLeod, the watershed suffers from high levels of fecal coliform bacteria, total phosphorus, nitrate-nitrite nitrogen, and total suspended solids along with excessive peak flows.



Under an implementation phase initiated in 2004 the CWP has helped install a wide range of BMPs: Slotted Risers (37), Rock Tile Inlet (87), Removal of Open Intakes (6), Grade Stabilization Project (1), Water & Sediment Control Basin (3), Terrace Repair (6), Terrace (1), Diversion (1), Bendway Weir Project (1), Cover Crops (2,908 acres), Wetland Restorations (206 acres) and Filter Strips (123.9 acres), Rain Gardens (3), Rain Barrels (50), SSTS Upgrades (Sibley – 43, McLeod – 15 and Renville – 4).



High Island Creek Clean Water Partnership also put on two small-group manure and nutrient management workshops, and three fecal coliform bacteria open houses, developed a web site, published 24 six-page River Watcher newsletters sent out to over 2,000 people.



## 29. City of New Auburn Rain Gardens

The City of New Auburn located on the western shore of High Island Lake has launched a program to treat all its stormwater draining directly into the lake and creek with 43 rain gardens instead of installing an expensive curb and gutter system that would result in putting extensive piping under the city. Residents and other volunteers have committed to the project by providing labor and equipment to construct seven rain gardens over the last years with a large one planned for 2010 on the north end of town.

### 30. Friends of High Island

Friends of the Minnesota Valley sponsors a Watershed Initiative Program to develop a strong citizen network, coordinate with partners on habitat and wetland restoration projects, and work with landowners to reform land use practices to help reduce pollution entering the Minnesota River. In conjunction with the Friends of High Island, this program has installed 16 slotted risers, 32 rock tile inlets, four open tile inlets, planted 610 acres in cover crops, distributed 50 rain barrels, closed a manure pit, and completed nine septic system upgrades in the High Island Creek and Rush River watersheds.



Friends of High Island are also working with the DNR, High Island Creek Watershed District, High Island Creek Clean Water Partnership, Friends of the Minnesota Valley and other partners to conduct a drawdown of High Island Lake to improve water quality, encourage submergent vegetation growth and benefit wildlife habitat. Walleye fry will be stocked in the lake come spring by the DNR if there is a hard freeze. Repopulating the lake with more desirable fish like walleye will help improve water quality by keeping flathead minnow populations in check.

A new culvert installed at the outlet was paid for by the Friends of High Island through their annual



fundraisers and will facilitate current and future drawdowns. The group also launched a barley straw erosion control project to decrease the amount of phosphorus entering High Island Lake.

Monitoring of water quality will be done downstream to determine the effectiveness of the barley straw as a pollutant filter and erosion control measure.

## 31. Project Spotlight - Barley Straw

The idea behind utilizing barley straw to reduce phosphorus levels came to the Friends of High Island after seeing a presentation on this unique conservation practice at the 2009 Shallow Lakes Forum. After a

number of discussions the group decided it was worth testing out on water flowing into High Island Lake. In May, twenty-eight volunteers gathered to bale the barley straw



into 15 to 20 feet long bales using a Christmas Tree Baler. Over two days the group put together the bales and installed them in two of the lake tributaries in 5 separate locations. Water quality samples collected throughout the summer and fall showed a localized significant reduction of phosphorus. The group felt it was a positive learning experience and plan to fine tune the process for the 2010 season.

## 32. Thomas Wetland Project

Doug and Dee Thomas of Henderson converted land that had been cropped into wetlands and upland buffers on property they own near High Island Creek. The Friends of the Minnesota Valley helped the Thomas' complete a project creating two wetlands and planting native plants and grasses. Located adjacent to the bluffs of both the Minnesota River and High Island Creek, the land is sensitive to erosion and runoff issues. According to Doug Thomas, "This project is a way for us to do our part in helping the health of the two rivers. There is a lot of erosion coming off those gullies and we want to do something about it."

"It is our hope that others situated in similar areas will consider this option for their land and see the benefits of ownership." – Doug Thomas



Doug and Dee Thomas founded the New Minnesota Country School Henderson to help young people understand the real world and consequences of uninformed decision making, with an emphasis on nature, sustainability and personal responsibility. The New Minnesota Country School has been recognized with numerous awards and selected as one of eight charter schools in America to be successfully closing the achievement gap. 33. CREP Wetland Restorations - Sibley County

The largest wetland restoration in Sibley County is located along State Highway 19 creating a highly visible



educational opportunity. Completed in 2003 under the Conservation Reserve Enhancement Program (CREP), the 161 acre site features 91 acres of restored wetlands and 70 acres of native prairie. Sibley SWCD manages this permanent easement along with assisting the High Island Creek and

Rush River clean water partnerships with installing conservation practices including promoting the use of alternative open intakes and conservation tillage practices.

## 34. Jean William's Farm

Over the last 50 years, this landowner in Carver County has restored almost 78 acres of native prairie



grasses and wildflowers, 43 acres of wetlands and additional conservation enhancements. These practices include six acres of tree planting, and installations

of four cross vane rock weirs, and three cedar tree revetments to stabilize the banks of Carver Creek running through the property. Some of the land has been enrolled into the Big Woods Heritage Forest Stewardship program along with other permanent protection easements.

## 36. Lower Minnesota Valley Wetlands Conservation Initiative

The Migratory Bird Conservation Commission awarded a \$1 million grant to fund Phase II of a multi-year initiative to restore and enhance breeding and migratory habitats for waterfowl and other wildlife in the Lower Minnesota River Valley.

Funded from the North American Wetlands Conservation Act (NAWCA), seven partners – Pheasants Forever, Ducks Unlimited, Gary Renner, DNR, MN Valley National Wildlife Refuge Trust Inc, Shell Rock River Watershed District and the U.S. Fish and Wildlife Service – pledge to complete over \$3.2 million in habitat restoration and enhancement, easement acquisition, and fee-title acquisition over a two-year period.

This partnership of federal, state and private entities propose to restore 405 acres of wetland and grassland habitats, enhance habitat on 2,067 acres, and acquire fee-title on 527 acres within the project area on both public and private lands. The initiative focuses on accelerating the restoration and enhancement of grasslands and wetlands along with the associated wildlife populations which depend on those habitats.



## 35. Wetland Reserve Program - Carver County

Carver SWCD staff worked in cooperation with the National Resource Conservation Service (NRCS) to

convince landowners Donald and Barbara Wagener (73 acres) and an adjoining site (6 acres) owned by Ronald and Miriam Hilk to enroll these two pieces of property just west of Lake Waconia into a permanent easement under the Wetlands Reserve Program (WRP). NRCS highlighted the enrollment



with a WRP 2-million acres ceremony to mark the national goal of increasing wetlands across the United States.

## Future Project Spotlight - Blue Lake WTP

Named for the an obscure backwater on the Minnesota River, the Metropolitan Council is spending \$28 million to extract methane gas from wastewater solids. According to officials, in addition to energy savings the biomethane production adds to the reliability of the wastewater system. The plant is required to reduce discharge into the Minnesota River to meet water quality standards. As the third largest wastewater plant in the state, the Blue

Lake Wastewater Treatment Plant (WTP) serves 275,000 people from Lake Minnetonka to Prior Lake and treats 26 million gallons of wastewater daily.

## Lower Minnesota River Watershed Conservation Practices and Land Use



watershed, and individual-project basis from 1997 to 2008. The number of conservation practices reflects only actual contract and not the acres. There are additional conservation practices installed in the Minnesota River Basin but not recorded in either LARS or eLINK.



NOT SPECIFIED

0%

OTHER CALCULATED

POLLUTION REDUCTION

## Lower Minnesota River Watershed Pollution Reduction

The charts below summarize water quality data from 2000-2008 in the Lower Minnesota River Watershed for High Island Creek, Rush River and Sand Creek. These charts illustrate Flow-Weighted Mean Concentration (FWMC). FWMC is calculated by dividing the total load (mass) for the given time period by the total flow or volume. It refers to the concentration (mg/L) of a particular pollutant taking into account the volume of water passing a sampling station over the entire sampling season. Conceptually, a FWMC would be the same as routing all the flow that passed a monitoring site during a specific time frame into a big, well-mixed pool, and collecting and analyzing one sample from the pool to give the average concentration (State of the Minnesota River 2000-2008 Report).



## High Island Creek

The High Island Creek Watershed (HICW) started monitoring in 2001. There were two spikes in TSS levels, one in 2001 and the other is 2004. Successive years after these spikes, the trends show a steady decline. In 2004, HICW began its first phase of implementation, providing landowners with a variety of ways to reduce sediment from entering the nearby waterway. This could have possibly affected the downward trend in TSS with the landowner participation in these programs. In HICW, the highest TSS rates occur at the eastern end of the watershed located in the Minnesota River bluffland. This area is characterized by its steep ravines and gullies leaving it vulnerable and highly erodible.

## **Rush River**

The Rush River Watershed (RRW) started monitoring in 2003. In 2004, TSS levels peaked and have stayed relatively stable to slightly decreasing ever since then. In 2003 the Rush River began with a diagnostic study to determine the water quality. March 2006 started the Rush River Watershed Implementation Project, in which the project provides cost share and incentives to keep the sediment in place and prevent further erosion. Like HICW, the RRW sees its highest TSS rates at the eastern end of the watershed which is also located in that Minnesota River bluff-land area.



## High Island Creek

Like TSS, levels of TP in High Island Creek peaked in 2004. Levels of TP in 2001 through 2004 were very high, but the overall trend shows a major decline through 2008. In HICW, phosphorus loading is attributed mostly to agricultural runoff and stream bank/gully erosion. In both cases, the phosphorus input is closely associated with soil erosion. With the TSS levels trending downward, it is assumed that TP levels will also continue its downward trend.

## **Rush River**

The Phosphorus levels in the Rush River Watershed (RRW) peaked in 2004 but overall the trends show a slight decline. With the TSS trends the way they are, Phosphorus levels are expected to decrease slightly in the future as well. In RRW the TP levels are highest in the North Branch of the Rush River as well as on the eastern end of the watershed. During the diagnostic study it was discovered that Gaylord, Winthrop, Gibbon, Lafayette and Waldbaum treatment plants accounted for only 4% of the TP load at the outlet of the watershed. The majority of the TP load was occurring from non-point sources.



## HI-Nitrate-Nitrite (NO2-NO3)

Unlike the parameters of TSS and Total Phosphorus, Nitrate levels continue to steadily increase at all the monitoring sites. Monitoring results from 2001-2008 show an overall average of 12.7 mg/L which would be elevated above the Minnesota state drinking water standard of 10.0 mg/L. However, the highest levels in the watershed consistently have been found at monitoring site 9P, representing the outlet of the sub-watershed Buffalo Creek before it enters High Island Creek.

## **RR-Nitrate-Nitrite (NO2-NO3)**

Nitrate levels of the RRW have displayed a slight decline through the years. Monitoring results from 2003-2008 show an overall average of 19.0 mg/L which is much higher than the Minnesota state drinking water standard of 10.0 mg/L. Nitrate levels peaked in 2004 with a FWMC of 22.57 mg/L. RRW is noted in the State of the MN River Report to have the highest concentrations of nitrogen in all of the MN River Basin. This could be due to the extensive tile drainage system this watershed has in place as well as the over application of Nitrogen from producers.