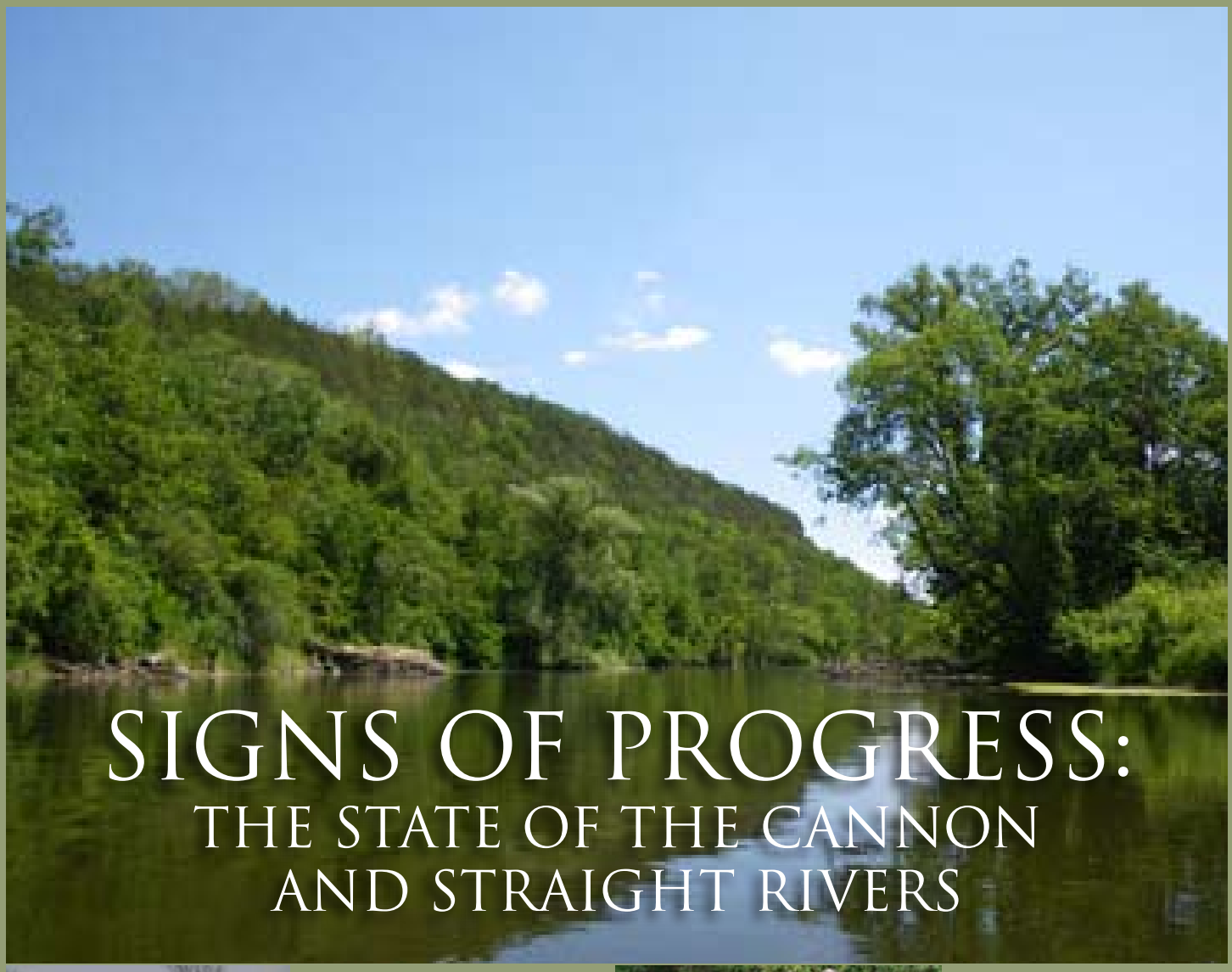

SIGNS OF PROGRESS:
THE STATE OF THE CANNON AND STRAIGHT RIVERS

Dear Reader,

Clean water. So vital to our lives and something we all value. At the Cannon River Watershed Partnership we envision a time when the waters of our area are healthy, when it is safe to swim in all the lakes and rivers, when we can eat fish without worry, enjoy a canoe trip free from garbage in the river, and all drinking water is clean. In order to achieve this vision, it is important for the people who live and recreate in this area to understand some information about the water, land and wildlife, to get out on the water and to take action to improve the water. This document is our attempt at providing some of that information and sparking your interest in getting involved.

Many good things have happened in the last fifty years. In 1958 a memo from the DNR indicated the Cannon River by Faribault was uninhabitable for fish due to industrial pollution of the water. The river has come a long way since then. We no longer discharge raw municipal sewage to the rivers, industrial facilities treat their discharge to limit pollution, cities are doing a better job with street runoff, and farmers are working to improve their practices to protect the water. There are signs of progress such as the comeback of the Bald Eagle and some of the streams and lakes showing improvements. There is still a long way to go in some areas and we hope you will be our partner in working toward making the needed changes a reality.

Special thanks to the Water Resources Center at Minnesota State University Mankato for compiling much of this document and to the Minnesota Pollution Control Agency for providing the funding to make it happen.

Beth Kallestad
Executive Director
Cannon River Watershed Partnership

February 2011

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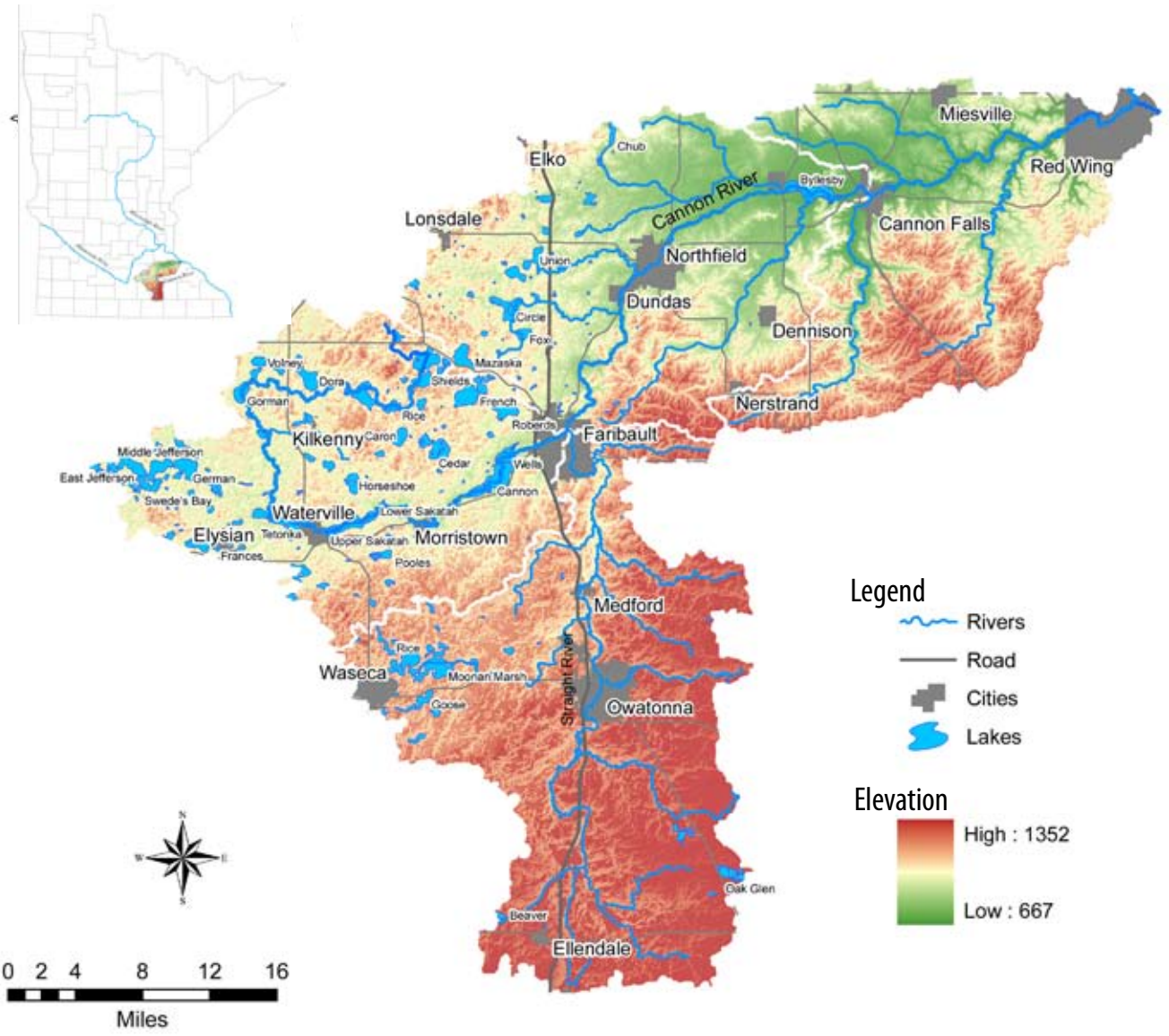
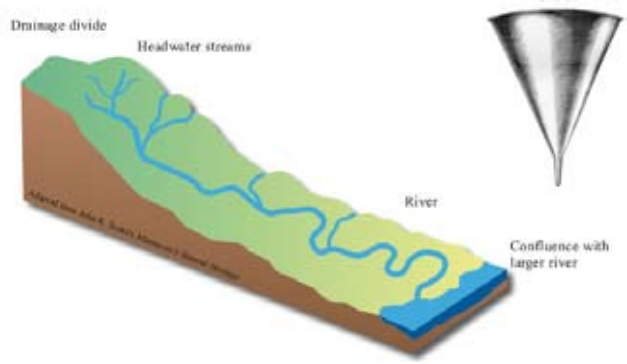
TABLE OF CONTENTS

Cannon River Watershed



The two main rivers in the Cannon River watershed are the Cannon and Straight. The Cannon River originates in Shields Lake and flows west before turning south and then east as it goes through Waterville, and on to Faribault. The Straight River begins in Oak Glen Lake south of Owatonna. It flows directly north and joins the Cannon at Faribault. From Faribault, the Cannon flows north through Northfield, and finally turns east. It travels through the Byllesby Reservoir and Cannon Falls and finally drains to the Mississippi River just north of Red Wing. The Cannon River watershed covers 946,440 acres and includes parts of six counties—Steele, Rice, Goodhue, Le Sueur, Dakota, and Waseca.



What is a watershed?

A watershed is the land area that drains water to a body of water such as a particular stream, river, or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. A watershed is like a funnel—collecting all water within the drainage area and channeling it into a water body.

Monitoring the River's Condition

The purpose of monitoring is to provide assessments of the current status of the lakes, streams, and rivers in the Cannon River watershed with respect to water quality standards and goals, identify problem areas, and detect changes in water quality with time.

Monitoring

State and federal agencies, watershed staff and citizens all perform water quality monitoring across the Cannon River watershed.

Citizen Monitoring

The Cannon River Watershed Partnership organized its volunteers to participate in the MPCA's Citizen Stream Monitoring Program (CSMP) and Citizen Lake Monitoring Program (CLMP) in 1999 to monitor the watershed's lakes, rivers, and streams. For rivers and streams, volunteers take transparency tube (water clarity) and stream gage readings along with other water quality measurements. Lake monitors lower a secchi disk (shown on page 7) into the lake to measure water clarity.

The data that citizen monitors collect is extremely valuable in understanding the long term trends and changes in our water. Currently there are about 60 citizen monitor volunteers in the watershed. Due to the large number of streams and lakes in the watershed, CRWP is always looking for motivated and interested citizens willing to participate in its citizen monitoring program.

Monitoring Season and Methods

Monitoring season length is typically April 1 (or ice out) through September 30. This period typically captures the months when the majority of flow occurs and when nutrient and sediment loads are expected to be the highest.

Carleton College

Monitoring with transparency tube

B.J. Norman, a citizen monitor with transparency tube

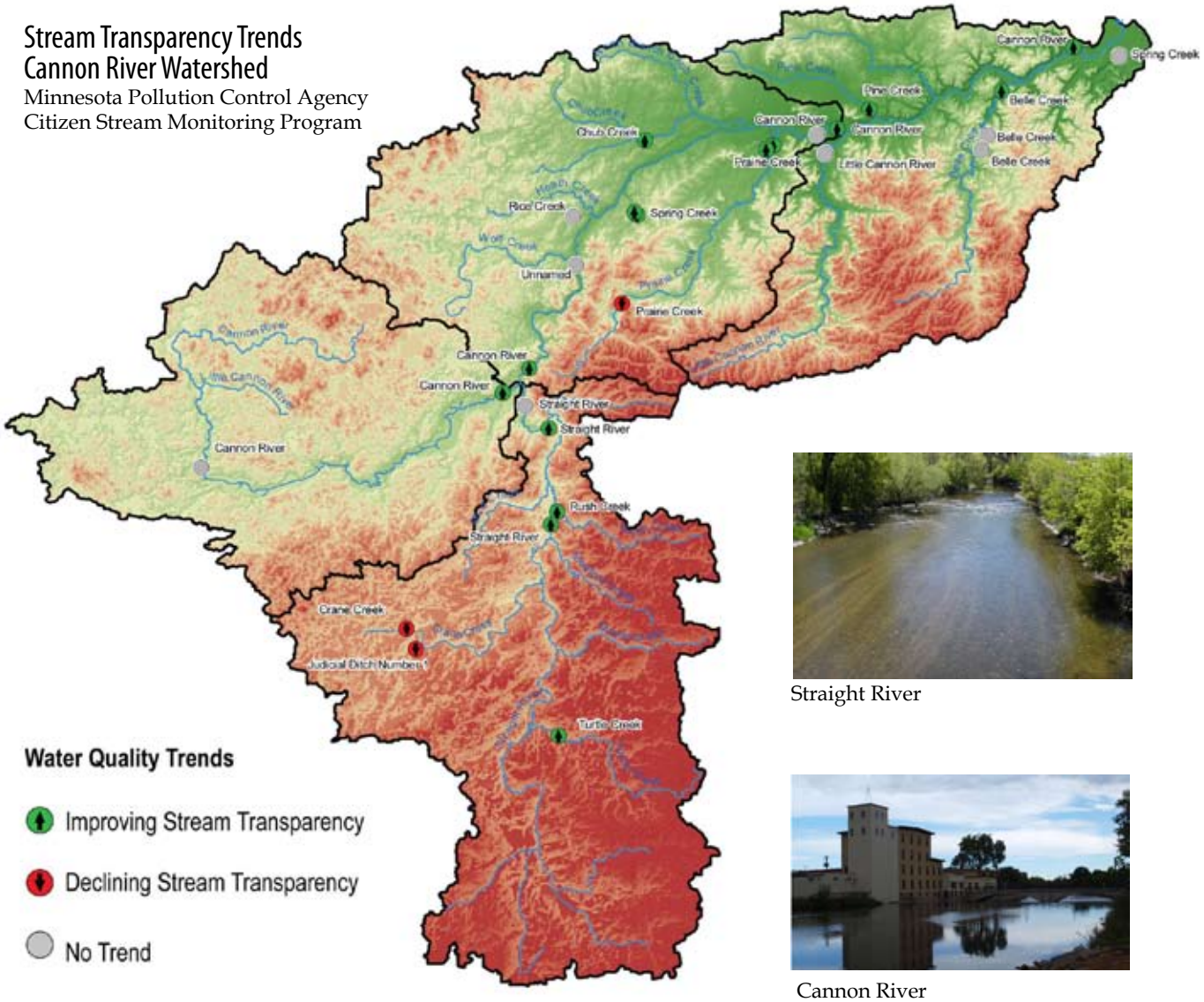
Get Involved: Become a Citizen Monitor

Help better understand your watershed by measuring a number of water quality parameters on an area lake or river. To Learn More, see the "Get Involved" section:

- Cannon River Watershed Partnership
- Minnesota Pollution Control Agency, Stream and Lake Monitoring Programs

John Van Burgen, a citizen monitor collecting samples from Spring Creek

The map below illustrates that many streams and rivers in the Cannon River watershed have become clearer since the MPCA started its citizen stream monitoring program. Trends results show: 15 streams with increasing clarity, 3 with decreasing trends, and 9 with no trends. The increased clarity is likely due to decreasing erosion and sediment in the watershed. Currently, there is not enough data to show if nutrients and bacteria levels are increasing or decreasing in our streams and rivers. As more data is collected in the coming years we will be able to see if these pollutants are decreasing as well. See pages 14-16 for more information on current pollution problems.

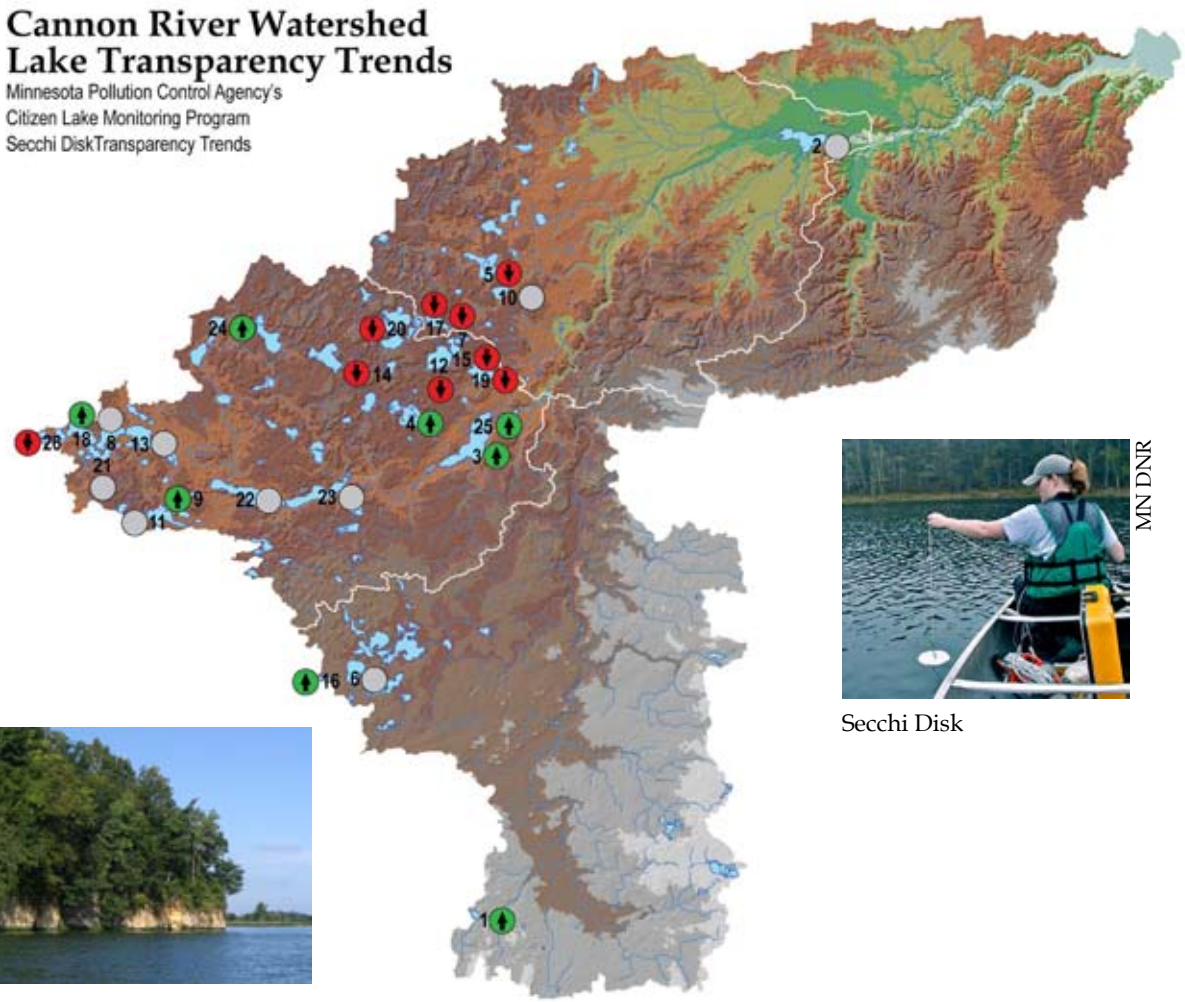


Straight River

Cannon River

The map above illustrates trends in stream and river transparency data collected across the Cannon River watershed by Minnesota Pollution Control Agency's Citizen Stream Monitoring Program. Trend analyses were performed using transparency tube data over available years of data.

The map below illustrates that there are mixed results for lake transparency trends over the past 30 years. Nine lakes show lake clarity increasing, 8 lakes show lake clarity decreasing, and 9 show no trends. Like with streams and rivers, there is not enough data to show if nutrient (phosphorus) levels are increasing or decreasing in our lakes. As more data is collected in the coming years we will be able to see if nutrient levels are decreasing.



MN DNR

Secchi Disk

Water Quality Trends

- Improving Lake Transparency
- Declining Lake Transparency
- No Trend

Lake Monitoring Sites
(Monitoring Years - All available data between years)

1 Beaver (1997-2008)
2 Byllesby (1992-2008)
3 Cannon (1989-2008)
4 Cedar (1979-2008)
5 Circle (1983-2008)
6 Clear (1985-2008)
7 Dudley (1992-2008)
8 East Jefferson (1987-2008)
9 Fish (1996-2008)
10 Fox (1970-2008)
11 Frances (1987-2008)
12 French (1978-2008)
13 German (1985-2007)
14 Hunt (1995-2008)
15 Kelly (1993-2008)
16 Loon (1992-2008)
17 Mazaska (1992-2008)
18 Middle Jefferson (1991-2008)
19 Roberds (1987-2008)
20 Shields (1993-2008)
21 Swede's Bay (1997-2008)
22 Tetonka (1986-2008)
23 Upper Sakatah (1998-2007)
24 Volney (1987-2008)
25 Wells (1999-2008)
26 West Jefferson (1987-2008)

The map above illustrates trends in lake transparency data collected across the Cannon River watershed by Minnesota Pollution Control's Citizen Lake Monitoring Program. MPCA selected all available Secchi Disk data from STORET, the US EPA's national water quality database. The statistical package Systat was used to perform the Seasonal Kendall test to determine whether the data for each lake exhibited increasing or decreasing trends.

Historical Overview


smallmouth bass
© Joseph Tomelleri

Water quality in the Cannon River Watershed has markedly improved since the 1930s and 1950s when the streams were characterized by fish kills and point-source pollution problems from sewage and industrial waste. Prior to the1930s the Cannon and Straight rivers were known for their smallmouth bass fishery. In 1937 there were two large fish kills due to pollution from canning operations, one by pumpkins and the other with corn waste being directly discharged into the rivers. Owatonna was the first city to build a wastewater treatment plant in 1939 while Faribault didn't get one until 1954, after a citizen vote defeated the proposal in the 1930s.

In 1958, the Department of Conservation (Today's MN DNR) examined pollution on the Cannon River at Faribault. According to Donald Woods of the DNR, "there had been repeated instances of pollution since 1956 even with the installation of a municipal sewage treatment plant. This pollution has made the river unfit for most fish, particularly Small Mouth Bass. Occasionally, pollution gets so bad that oxygen depletion results and fish are killed."

Fish surveys were conducted in the 1970s and 1980s by the DNR on both the Cannon and Straight Rivers through the use of electro-fishing, which temporarily stuns the fish to allow them to be collected and counted. These surveys recorded a diverse selection of fish including northern pike, walleye, rock bass, black crappies and black bullheads. The reports noted a number of water quality concerns including sediment runoff causing turbid waters and point-source pollution still being a concern.

Present Condition

Fish are associated with healthy rivers and have historically been studied as biological indicators. Today, both the Cannon and Straight Rivers have high fish diversity. On the Straight River, 35 to 40 species of fish have been documented, with the Cannon River 42 species above Lake Byllesby and 47 species respectively below the dam. There are four trout streams in the watershed, one of which (Rice Creek a.k.a. Spring Brook) has a natural population of brook trout that the DNR uses to help restock other streams in the state. The DNR stocks walleye, northern pike, smallmouth bass, and trout in various parts of the watershed.

Gamefish in the Cannon River and Tributaries

Walleye
Bluegill
Largemouth Bass
Smallmouth Bass
Channel Catfish
Northern Pike
Brown Trout
Brook Trout

In September 2010, the DNR conducted fish surveys on the Cannon River between Pine Creek and Trout Brook. DNR staff were impressed with the diversity, number and size of fish they saw including smallmouth bass (17 to 19 inches), walleyes (20 to 30 inches) and brown trout (up to 20 inches). They also recorded decent numbers of channel catfish along with plenty of rough fish like suckers, redhorse, carp and sheepshead. On the other hand, there were few panfish like crappies and bluegills.


14 lb 10 oz Carp (*Cyrpinius carpio)* caught by Justin Watkins on the Cannon River

One of the more recent surveys was conducted on Cannon Lake (1,591 acres west of Faribault) in August of 2009. They found an abundant walleye population along with yellow perch, white bass and white sucker. The survey also recorded 22 channel catfish with no observations of largemouth bass (Haggerty, 2010).


channel catfish
© Joseph Tomelleri

HISTORICAL SNAPSHOT

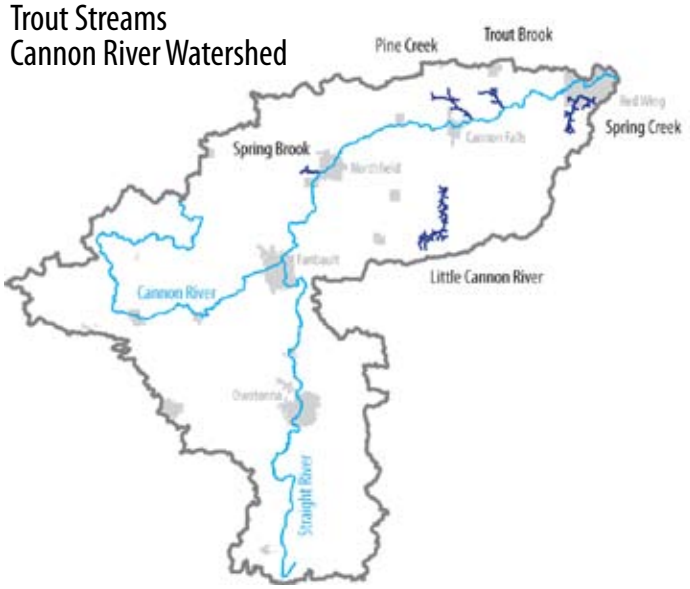
Northern Pike and the Straight River in the 1980s


northern pike
© Joseph Tomelleri

Northern Pike were the most important gamefish in the Straight River in 1980s. DNR fisheries report stated that it will be critical in future years to protect what little access to spawning areas remains for this species. Channelization and wetland drainage permits in particular should be examined closely to ensure future habitat destruction does not take place.

A 1983 DNR Fish Survey stated *"Agricultural land use of the watershed has caused degradation of stream physical characteristics and extremes in discharge fluctuations. Channelization and drainage of adjacent wetlands has severely restricted access for spawning norther pike to these areas. Municipal pollution from the City of Owatonna degrades water quality downstream for several miles and may be the major limiting factor for gamefish in this reach. Water quality probably limits overall gamefish abundance in this stream."*

Trout Streams
Cannon River Watershed



Designated Trout Streams

Brook and Brown Trout

Introduction of non-native brown trout into many streams in the watershed have made the region a hotspot trout fishery. Many of the spring-fed tributaries of the Cannon River from Cannon Falls to the Mississippi are prime habitat for brown trout.

Rice Creek (a.k.a Spring Brook), one of the regions only naturally reproducing trout streams, contains brook trout (near Dundas/ Northfield, MN).


Trout spawning bed


Brook trout


Trout Brook

What are Mussels?


Tom Roster

Mussels are a member of the Mollusks, the second largest group of animals in the world and can be found on every continent except Antarctica. As a freshwater organism, mussels live in permanent bodies spending their entire life partially or completely buried on the bottom of rivers and lakes. North America supports the largest number of mussels at close to 300 species with 48 here in Minnesota. Of those species, 25 are listed as endangered, threatened, or of special concern and two considered to have been extirpated.

History of Mussels

Before the start of Euro-American Settlement in the 1850s, the Cannon River Watershed supported a diverse mussel fauna. At least 25 species were once found in the Lower Mississippi River of Minnesota according to D.L. Graf. Over time the diversity and population of mussels have been severely impacted by a number of factors. Three of the major factors involve the transformation of the natural landscape to one dominated by agriculture, construction of dams and the harvesting of mussels for the commercial shell industry at the beginning of the 20th Century. By the 1940s, it was considered a rarity to find a mussel in the Cannon River Watershed.

TIMELINE

1904	Northfield News article complained about the mess left by pearl seeking "clam (mussel) hunters."
1920s	Residents of the Cannon Falls area remember the Cannon River being paved with clams (mussels).
1930s	Clammers or mussel hunters regularly harvested and shipped mussel shells to supply the button industry.
1940s	Finding a living mussel becomes a rarity, casualties of the depression and the economic opportunity shell sales offered its victims.
1987	Mike Davis of the MN DNR's Nongame Wildlife Program conducts a comprehensive mussel survey of the watershed. A total of 1,344 live mussels representing 15 species were found at 61 sampling stations located across the Cannon River Watershed.
1998	A mussel survey of 9 sites is conducted on the Cannon River and tributaries by Michael C. Swift of St. Olaf College and Gary E. Wagenbach of Carleton College.
2008-10	The Minnesota DNR maintained a monitoring station on the Cannon River over this three-year period.

Mussel images: http://cruisingamerica-halcyondays.com/towns.htm

Buttons and Pearls

The Cannon River mussel fauna was abundant and diverse enough to support a commercial shell industry into the 1920s (Davis, 1988). The mussel fauna in the Cannon drainage has decreased since European settlement due to human impacts.

Mussel Surveys

Three major mussel surveys have been conducted in the Cannon River Basin: the first in 1987 by Mike Davis of the Minnesota DNR; a second by Michael C. Swift of St. Olaf College and Gary E. Wagenbach of Carleton College in 1998 and finally the Minnesota DNR maintained a mussel monitoring station from 2008 to 2010.

1987 Davis Survey

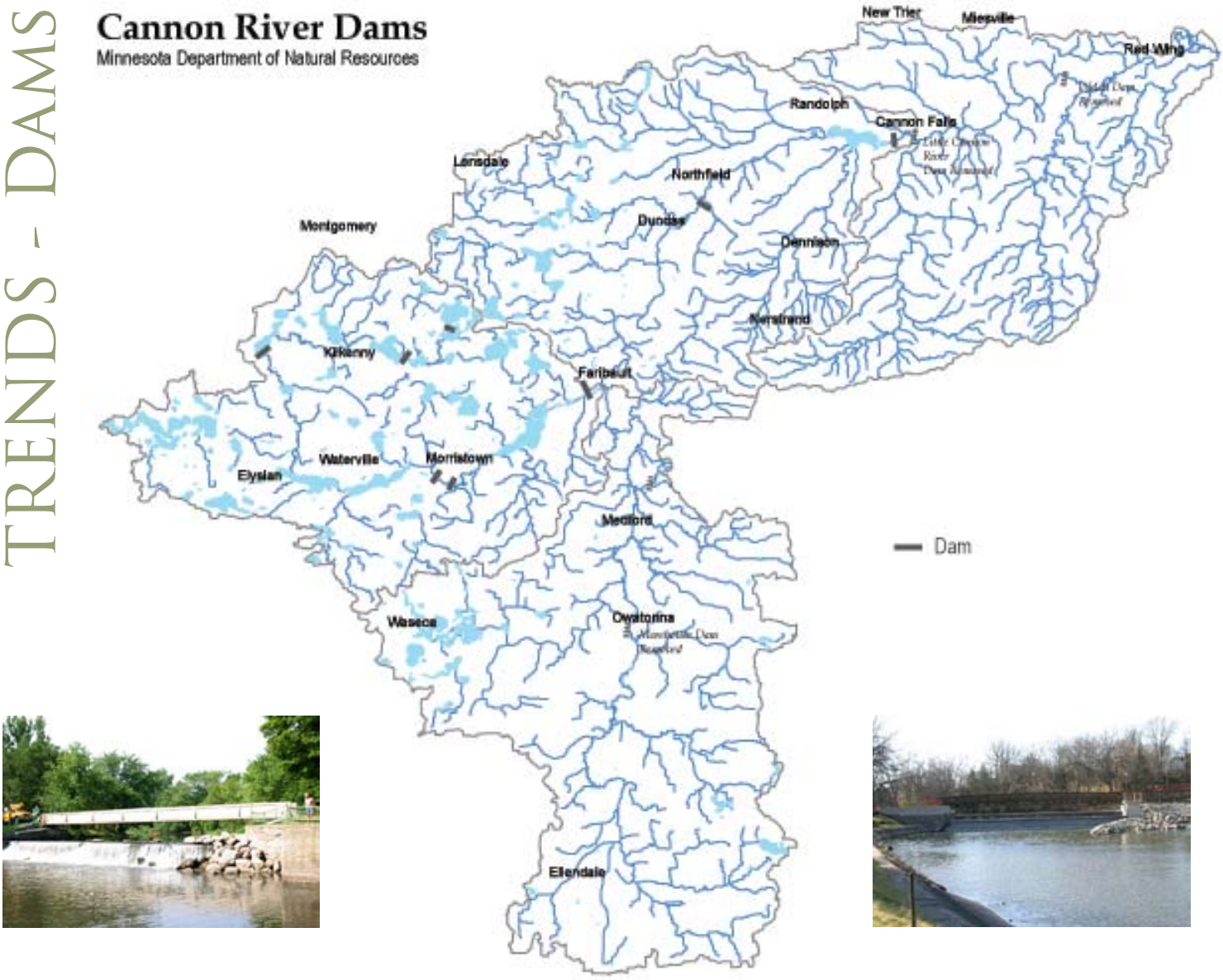
A total of 1,344 live mussels representing 15 species were found at 61 sampling stations located across the Cannon River Watershed. Of special importance, Davis discovered a new live Minnesota mussel species – the *Actinonaias ellipsiformis* (Ellipse). They also saw evidence of massive distributional disruption and mussel species extirpations in several areas of the watershed drainage. Another discovery was a very large, densely populated mussel bed within the tailwaters of an old mill dam. Davis estimated the 27 meter by 14 meter bed contained 18,685 mussels.

Future Surveys

In 2011, the MN DNR will conduct a more comprehensive mussel survey for the Cannon River Watershed.

"Eleven species of mussels are still present in the Cannon River after post Euro-American settlement loss. Mussels filter water and eat small particles. Restoration of these water cleaning animals could be accomplished by modifying or removing dams that will enhance migration of fish that serve as necessary hosts for young mussels."

- Gary Wagenbach, Retired Carleton College Professor, Rice SWCD Supervisor, CRWP Board Member



Dams

Dams were built all across Minnesota and nine dams are still in place on the Cannon River to harness power from rivers, control water elevation levels, or as historic mill sites. Along the Cannon River, five dams act as fish barriers - Morristown, King's Mill and Woolen Mill in Faribault, Ames Mill in Northfield, and Lake Byllesby; three dams are passible during high flows (Shields Lake, Gorman Lake, and Schmidtke's in Waterville); and one is passible year-round (Rice Lake Dam) (Carlson, 2004). One of the biggest concerns with dams is that they prevent fish movement upstream along with impacting fish breeding and colonizing of new areas. When dams limit fish migration there can be severe consequences to diversity and population numbers if a stretch of river experiences a fish kill. Mussels are also impacted by dams because they count on specific fish to serve as larvae hosts and for movement to other areas in a river.

In the last fifteen years, three dams have been removed on the Cannon and Straight Rivers. The dam at Welch was removed in 1994. See the restoration success story on page 22 for more information. In 2001, the Little Cannon River dam in Cannon Falls was removed. And in 2006, the Morehouse Dam on the Straight River in Owatonna was partially removed. In recent years there has been discussion in Northfield of removing the Ames Mill Dam, which would create a free flowing Cannon River from Faribault to Lake Byllesby.

TRENDS - EAGLES

Bald Eagle (*Haliaeetus leucocephalus*) populations in Minnesota have made a dramatic recovery since DDT was banned and they came under the protection of the federal Endangered Species Act in 1978.

The results of DNR's 2005 statewide bald eagle survey reflect a steady increase in Minnesota's bald eagle population over the past thirty years. The growth of the state's bald eagle population appears to be slowing, but remains at a healthy level.

John Tittle- rwnaturenotes.net

Eagle in the Cannon River

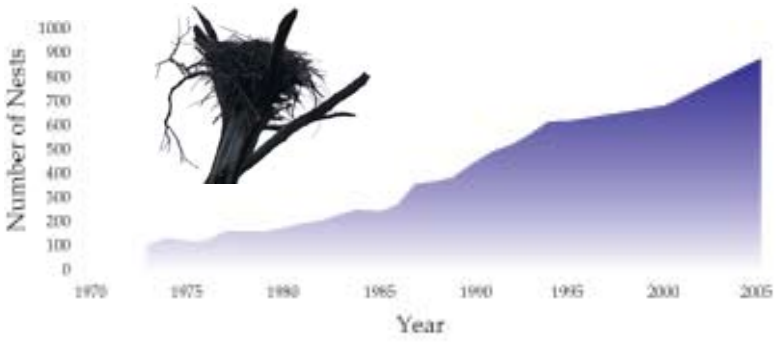


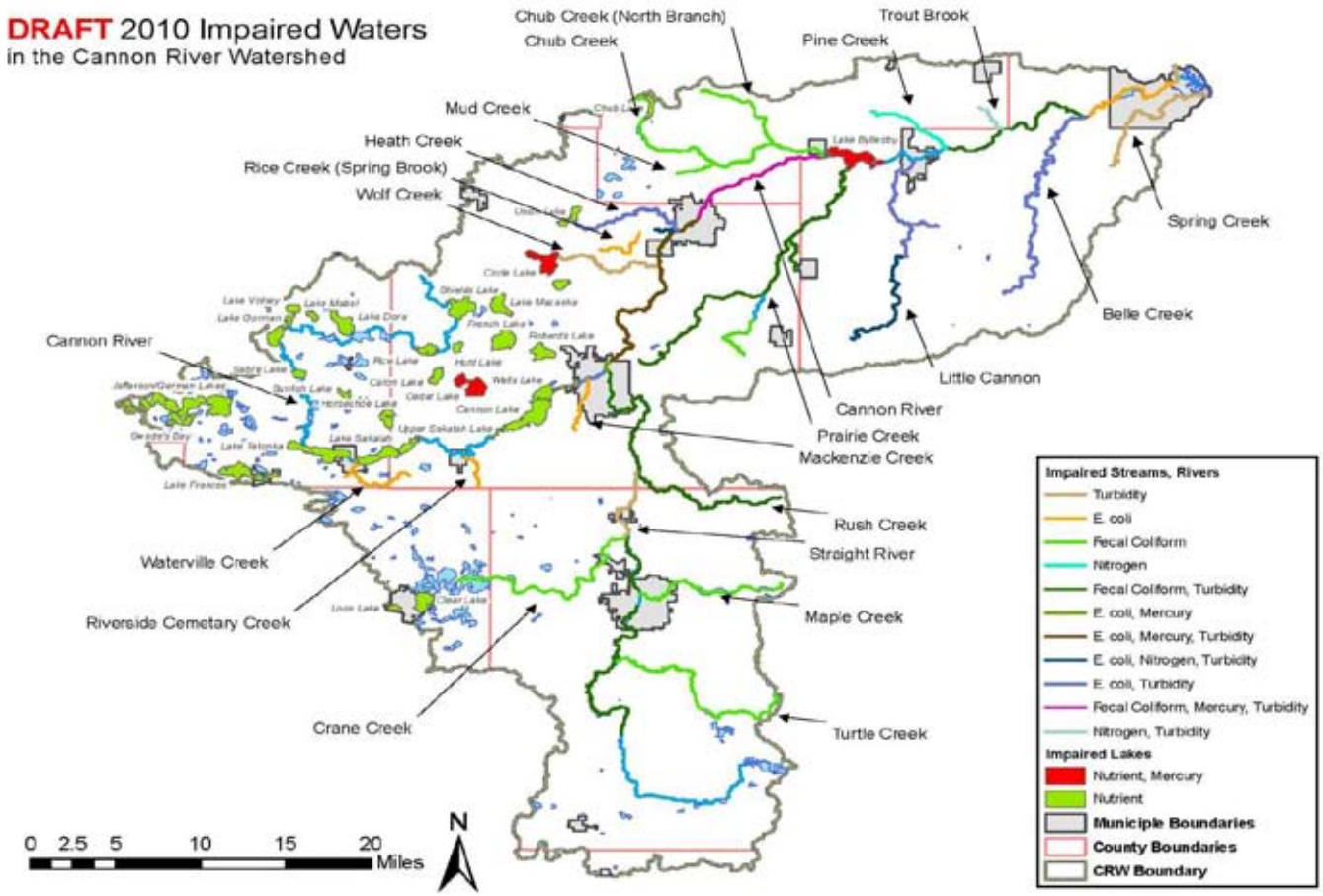
Chart illustrating the number of known Bald Eagle nests in Minnesota, 1973-2005. Source: DNR, 2005

"In the thirty some years that I have been paddling the Straight and Cannon rivers, only in the last decade or so has the bald eagle become part of the landscape. I first discovered an eagle's nest on the Cannon north of Faribault in 2004 while kayaking. Although I don't know when it was originally built, I have witnessed 16 fledglings born in this nest since then. There is nothing finer than watching one of these eagles spot a fish swimming or floating near the surface of the water. As it drops out of a tree, it approaches its prey in a shallow glide and snatches the fish out of the water with a quick swipe of its talons.

I believe that the fact that the eagle has made these gains in the watershed is due largely to the improvements in the water quality. Eagles sit at the top of the food chain, making them more vulnerable to toxic chemicals in the environment, since each link in the food chain tends to concentrate chemicals from the lower link. These majestic birds have made an exceptional comeback similar to the growth in numbers of several game fish such as the small mouth bass and the walleye."
– Gary Mogren, Former CRWP Board Member, River Enthusiast

Waters that Don't Meet State Water Quality Standards - Impaired Waters

While most of the rivers and some of the lakes are getting clearer, there are still pollutants that are causing problems and are the focus of conservation efforts. Below is a map of the Cannon River watershed showing impaired waters. A water body is considered impaired if the water quality in the stream or lake does not meet one or more of Minnesota's water quality standards. Water quality standards are set on a wide range of pollutants. The primary pollutants of concern are turbidity (dirt), nutrients (phosphorus), and bacteria.



July 2008 (7-09-08)

August 2008 (8-07-08)

August 2008 (8-25-08)
Cannon River downstream of Lake Dora

Excessive Erosion & Sedimentation leads to Brown Rivers

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, greatly reducing their appeal for people who enjoy boating, fishing, or swimming. Sediment carries nutrients, pesticides, and other chemicals into the river that impact fish and wildlife species. Fine-grained sediments that settle on streams beds cover desirable rock and gravel that form essential habitats for invertebrates and fish.

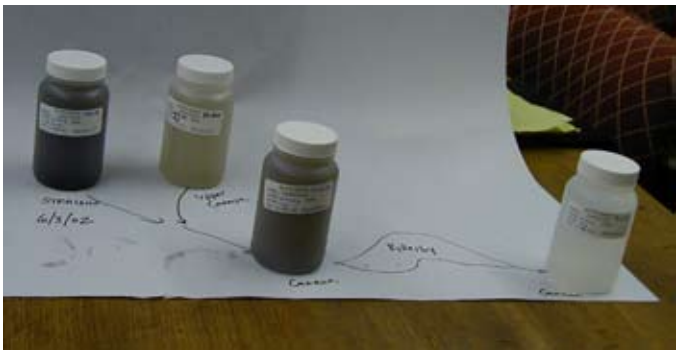
While page six highlights that we have made progress over the last twenty years reducing erosion of sediment (dirt) into the streams and rivers of the watershed, there is still much work to be done.

What is Turbidity?

Turbidity refers to how clear the water is. The greater the amount of sediment in the water, the murkier it appears and the higher the measured turbidity.

The confluence of Wolf Creek with the Cannon River August 2007

Agricultural erosion on Belle Creek May 2008



This photo illustrates the difference in water quality samples throughout the Cannon River watershed for a particular rain event (in 2002). For this event, the differences among the lobes and Cannon River are striking. The Straight River is very dark colored (turbid) while the Cannon River downstream of the Byllesby Dam was running almost clear.

T-tube on Straight River 8-13-10

Elevated Nutrients lead to Green Lakes and Rivers

Excessive amounts of nutrients, namely phosphorus, create a fairly constant nuisance algae presence in the majority of area lakes. Phosphorus-enriched streams and lakes are commonplace in the Cannon River Watershed.

Byllesby Reservoir 2003

What is Phosphorus?

Phosphorus is an important nutrient for plant growth. Elevated phosphorus levels stimulate algal growth and often lead to undesirable conditions. Excessive algae growth, death, and decay can severely deplete the oxygen supply in the river, endangering fish and other forms of aquatic life. Low dissolved oxygen concentrations can be a concern particularly during low-flow times or in slow-flowing areas. Large total phosphorus loads can have major impacts both locally and on lakes the Cannon and Straight flow into, such as Lake Byllesby and Lake Pepin on the Mississippi River.

Phosphorus Sources

Point-source phosphorus comes mainly from municipal and industrial discharges to surface waters. Nonpoint-source phosphorus comes from runoff from agricultural lands, urban areas, construction sites, manure transported in runoff from feedlots and agricultural fields, and human waste from noncompliant septic systems.

Roberds Lake August 2004

Bacteria leads to Unsafe Swimming

What are *E. coli* Bacteria?

Escherichia coli (abbreviated as *E. coli*) are a large and diverse group of bacteria. *E. coli* is a type of fecal coliform bacteria which are associated with human or animal wastes. They are commonly found in the intestines of animals and humans.

The presence of indicator bacteria *(E.coli* and fecal coliform) indicate sewage or animal waste contamination and potential presence of disease-causing organisms. *E. coli* and Fecal Coliform bacteria are used as markers for water contamination. There are hundreds of strains of the bacterium *E. coli* and most strains are harmless and live in the intestines of healthy humans and animals. However, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses.

Sources of E. coli

Fecal coliform and *E. coli* bacteria found in rivers and streams comes from human, livestock, pet, and wildlife waste. Bacteria can be directly transferred to surface waters from noncompliant septic systems, wastewater treatment plants and urban stormwater systems. Other sources include spills or runoff from feedlots or manure storage facilities, runoff from agricultural lands that receive manure applications, and direct deposition into waterways by wildlife or grazing animals.

Human HIstory - Native Americans

People began to inhabit the Cannon River Watershed after the most recent glaciers retreated (10-12,000 years ago). (Carlson, 2004) The Cannon River valley is one of Minnesota's most important archeological areas. Using information gathered from burial mounds and village sites, archeologists have pieced together a picture of life here in prehistoric times. By 1,000 A.D. the area near the junction of the Cannon and Mississippi rivers was a major center of Indian life. The Oneota Indian culture was probably the closest prehistoric Minnesota people came to an urban society. The Oneota lived in large villages on the river terraces, cleared and cultivated land in the river bottoms, hunted and fished in the river

http://www.prairiemoon.com

Stiff gentian

Early Explorer's Accounts

French Explorer Joseph Nicollet traveled through the Cannon River in 1838 making observations. The following is an excerpt from his field notes. Sunday, September 16, 1838 . . . We … crossed Cannon River... The river is about 60 yards wide, 3 feet water and has a very swift current . . . . After crossing we traversed a prairie with rough weeds... and some damp places the … [– stiff gentian] was in the most beautiful state of perfection. Region of les bois francs (Big Woods) begins at the ford on the left bank of the Cannon River. (There is also) a mixture of prairie and clusters of hardwood trees [a savanna region].

Nicollet also traveled along the Straight River and noted: "Main fork [Straight River] 30 feet wide, clear and rapid, at the ford ½ foot deep. Cannon River 40 feet before the junction [with the Straight], clear and slow. Thirty-five feet after the junction, deep and slow" (Bray, 1976).

reflections.mndigital.org/u?/good,327

Cannon Falls 1880s

Minnesota Historical Society

Cannon River at Welch (1923)

Euro-American Settlement

The Cannon River was originally named La Riviere aux Canots ("The River of the Canoes") by French fur trappers. In the 1800s Europeans set up fur trading stations. They hunted buffalo and beavers that lived in the area. Both were hunted to extinction in the area by 1880s. The name "Straight" River comes from the Dakota word "Owatonna" translated as "honest, morally straight."

As settlers moved into the area, they harvested timber and grew wheat and other crops. The wheat was ground to flour in mills along the river. By 1877 a wheat boom dominated the Cannon River Valley. Fifteen flour mills operated along 20 miles of the river between Faribault and Northfield. The mills were powered by hydropower, available to mill owners by damming the river (Carlson, 2004). By 1910 wheat production declines after repeated crop failures caused by soil exhaustion and insects, See timeline on following page for additional information.

2 million Years Ago - Glaciers grind across what is now MN retreating and returning numerous

10,000-12,000 Years Ago - Final glacier retreats ending the Ice Age.

1,000 A.D. Confluence of the Cannon and Mississippi rivers is home to the Oneota Indians and used as a transportation route.

1600s

1600s French fur traders move into the area setting up trading posts.

1700s

1700s French fur traders named the Cannon River, "la Riviere aux Canots" meaning "the river of canoes" after discovering the Dakota hide their canoes in the Cannon River Bottoms. Eventually, the mispronunciation of the name led to it being called the Cannon River.

1800s

1826 Euro-Americans began to permanently settle the Cannon River valley.

1850s Cannon Falls becomes a stopping place as thousands of settlers move through the area and building of the railroad.

1852 The Dakota signs Treaty of Mendota with U.S. Government opening up the area to Euro-American settlement.

Minnesota Historical Society

Cannon Falls Mill 1856

1859 Cannon River Valley experiences short-lived ginseng boom as the Big Woods are cleared for railroad ties, lumber and barrels.

1877 A wheat boom dominates the Cannon River Valley. By 1877 there are 15 flour mills operating along 20 miles of the river between Faribault and Northfield alone.

Minnesota Historical Society

Threshing 1920

1900s

1890s Euro-American settlers start a "Pearl Rush" by collecting mussels for button making causing a sharp decline in the mussel population.

1910 Wheat production declines after repeated crop failure caused by soil exhaustion and insects. Only 1 of 15 mills continues to operate between Faribault and Northfield.

1937 Two fish kills are the result of canning operations (pumpkins and corn waste) being directly discharged into the rivers.

1958 A Department of Conservation (MN DNR) memo describes what is being dumped directly into the rivers: Wash water, dyes, hot water, blood, plant wastes and Sulfuric acid.

1967 MN Pollution Control Agency is established by State Legislature.

1972 Clean Water Act is enacted.

1980 The Cannon River is one of only seven rivers in Minnesota to be designated as a Wild and Scenic River. Added in 1980, this state designated stretch runs from Faribault to the Mississippi River.

1990 The Cannon River Watershed Partnership (CRWP) is founded as a citizen nonprofit organization working with government agencies and local citizens "to protect and improve water and natural resources in the watershed.

CRWP
Cannon River Watershed Partnership

Flooding in the Cannon River Watershed

A river's riparian zone or flood zone allows a river to naturally overflow its banks during winter snowmelt or intense rain storms. Normally, this doesn't present a problem except in times of extreme weather events combined with a human impacted floodplain that could involve structures, crop fields, roads, etc. The amount of impervious surface, man-made drainage systems and lack of natural water storage can also have a dramatic affect on the severity of flooding. To put it simply, a flood takes place when the capacity of the river channel exceeds its ability to hold all the water draining from a watershed. Flooding can also provide numerous benefits like recharging groundwater, settling out sediment and supporting wildlife habitat.

In the Cannon River Watershed, there have been significant past flooding events causing damage in communities along both the Cannon and Straight rivers. Flood events occurred on the Cannon River in March 1949, July 1951, June 1954, April 1965, April 1969 and March 1973. Prior to the 2010 flood, the largest flooding event took place in April of 1965 due to rapid spring snowmelt and heavy rains. According to hydro geologists, it was more than twice as large as any other flood that had been recorded on the Cannon River.

2010 Flood

Over the two-day period of September 22-23, 2010, southern Minnesota was hit with a 100-year storm. Water levels on many southern Minnesota rivers and streams approached or exceeded all-time highs. Numerous communities experienced major flooding including Owatonna, Faribault and Northfield. The Minnesota Climatology Working Group reported this event had some of the most significant "flash floods" in the state's climate history.

Northfield Historical Society

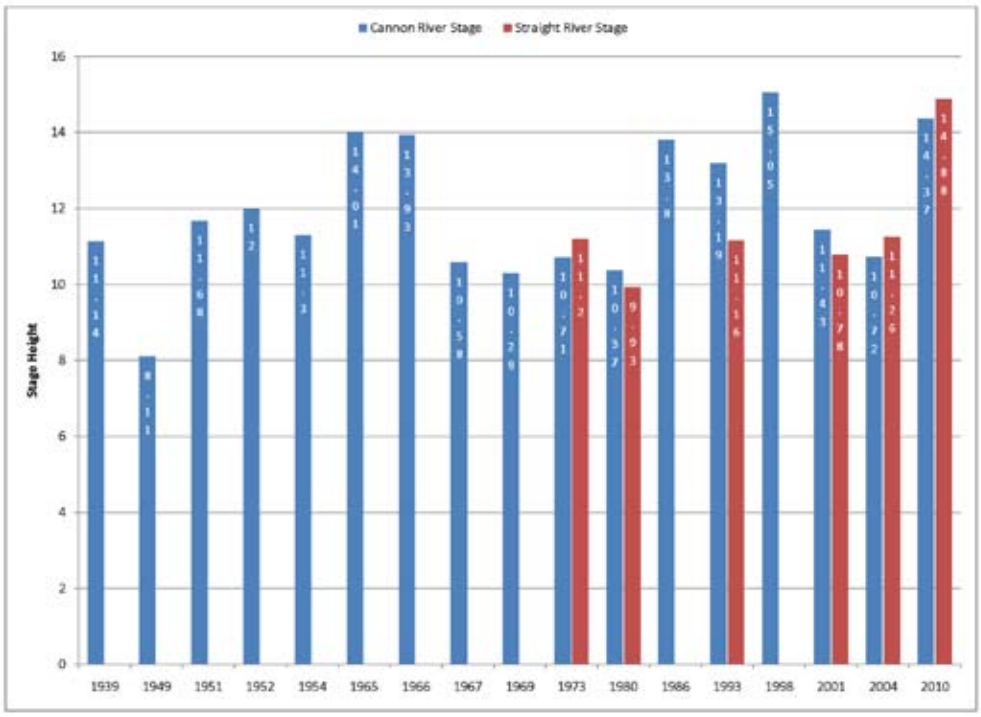
Cannon River Flood 1881

Northfield - Carleton College flooded field 2010

Owatonna flooding 2010

Historic Flooding: Cannon and Straight Rivers

USGS Stage Height



Point Sources - We've come a long way

The historic accounts below show dramatic sources of pollution entering the Cannon River--dyes discoloring the water, sulfuric acid solution, canning waste, and turkey blood and parts.

1958 Memo from State of Minnesota Department of Conservation – Game and Fish

Cannon River at Faribault

Repeated instances of pollution of the Cannon River at Faribault have been noted since 1956, despite the installation of a municipal sewage treatment plant. This pollution has made the river unfit for most fishes, particularly smallmouth bass. Occasionally, pollution gets so bad that oxygen depletion results and fish are killed. The major offenders have been the Faribault Canning Company and Faribo Turkeys. Other industries have occasionally made impossible adequate treatment of sewage at the municipal plant and pollution has resulted.

- ***Minnesota Mercury Inc**. – Manufacturer primarily of metal cabinets and parts for IBM in Rochester, occasionally dumped 1,000 gallon lots of 10% sulfuric acid into sewer lines, resulting temporarily in partial deactivation of treatment facilities at the municipal plant.*
- ***Faribault Woolen Mills** – Wash water and dyes previously have caused trouble. The dyes still discolor the treatment plant effluent occasionally, but not enough to be harmful.*
- ***Faribo Turkeys, Inc** –Turkey heads and offal (internal organs) are washed, drained, and group up to be sold as mink food. Further treatment of blood is necessary and methods are under consideration for improvements. Earlier this year before installation of larger screens, the plant wastes were too much for the municipal plant to handle and had to be dumped directly into the river.*
- ***Faribault Canning Company** – In 1957, the fermentation juices from a corn silage stack located at the factory were flowing directly into the Cannon River. The result was oxygen depletion and grown of large masses of sewage fungus. Fish, including Walleyes, were killed and drifting sewage fungus was carried as far as Northfield.*

Pollution Reported in 1977 DNR Fishing Report

Source	***Substance discharged***
Cannon Falls water	*Municipal sewage*
Minnesota Malting Company	*Untreated barley germination*
Mineral Springs Center	*Domestic wastewater*
Welch	*Domestic wastewater*

- *The discharges from the Minnesota Malting Company into Cannon Fall's municipal wastewater system resulted the overload (BOD- 580% and Total Suspended Solids – 200%).*
- *Industrial and municipal pollution has been a problem.*
- *Stream Bank Erosion – Sheet erosion was present in the agricultural areas of the valley bottom and uplands.*

Bacteria

Bacteria levels in the 1970s were extremely high according to monitoring records from 1977. The MPCA Standard (for 2B river) set a limit of 200 fecal coliforms per 100 milliliters of water. In 1977, two monitoring stations were analyzed for fecal coliform. The mean coliform count at US Highway 61 was 2,096 per 100 milliliters and at Randolph was 8,513 per 100 milliliters. In the 1970s, many small towns without sewage treatment facilities often discarded sewage by dumping it directly into streams, rivers, and lakes (MDNR, 1979).

Restoration Success Stories

Straight pipe outlet from historic trench into Straight River.

Hope Sewer System

For decades the small town of Hope (south of Owatonna) dumped raw sewage into the Straight River before completing a new sewer system in 2008 at a cost of nearly $1 million. Residents of this community had been trying to update its sewer system since the 1970s.

Ice melt in Straight River from straight pipe outlet.

The original sewer line from Hope to the Straight River was dug in the 1930s by a Works Progress Administration (WPA) crew. Men on this WPA crew dug the trench mostly by hand reaching seventeen feet deep. At the time this trench was considered progress for Hope since germs associated with raw sewage no longer caused sickness among the residents. Hope's sewage still goes to the Straight River, but now only after it is treated. Hope was assisted by CRWP's small community wastewater program. You can find information on current small community projects on www.crwp.net

Lake Volney Shoreland Restoration

Lake Volney is a 268 acre lake near the town of Le Center. The Lake Volney Association has been working with the Le Sueur County Environmental Services office to improve the lake's water quality. One project involved a shoreline restoration at the Lake Volney County Park beach. The beach had a very long slope that was mowed from the road right up to the water's edge. Consequently, an eroding shoreline washed beach sand into the lake. Funds from MPCA and the County Park Department in 2009 were used to stabilize the shoreline with native plants. The beach was moved away from the water's edge to stabilize the bank and native plants were seeded in this area. Native plants with deep roots protect the shoreline from erosion unlike traditional lawn grass. This also provides great wildlife habitat. This restored shoreline at thecounty beach fills a gap between earlier native grass planting by the DNR, creating a long section of restored shoreline on the lake.

Before - Eroding Shoreline Lake Volney Shoreland

After - Native Grasses and Restored Shoreline Lake Volney Shoreland

Trout Brook Watershed

Trout Brook is a tributary to the Cannon River located in southeast Dakota County. Impaired for turbidity, the Trout Brook Watershed is made up Karst topography, steep landscapes, and mostly agricultural land. This type of topography leaves the watershed susceptible to flashy runoff and downstream gully erosion. A number of landowners on the downstream end approached the Dakota SWCD to see about fixing extreme gully erosion issues on their properties. The size and scope of on-site fixes proved to be cost-prohibitive and difficult to maintain without control of upstream land use and water runoff retention measures.

Dakota SWCD started the restoration process by breaking the watershed into 7 sub-watersheds to survey and assess upstream properties with significant gully erosion issues. Landowners were contacted collectively from each sub-watershed to review identified conservation practices and gauge their individual interest. Nearly all landowners agreed to install some type of runoff reduction practice on their property. A $150,000 Clean Water Fund grant from Board of Water and Soil Resources (BWSR) to the North Cannon River Watershed Management Organization (NCRWMO) provided technical assistance and cost-share for the installation of runoff reduction practices within the watershed in 2010 and 2011. Baseline water quality monitoring examining overall effectiveness of the installed conservation practices will be conducted in the Trout Brook Watershed by Dakota SWCD and NCRWMO.


Trout Brook

Straight River Marsh Restoration

The Straight River Marsh area once covered almost 10,000 acres filled with native plants and functioned as a bountiful place for wildlife. Wildflowers and majestic oaks dotted the landscape. In 1915, the first ditch was dug through the marsh to allow farmers to drain their land for pasture and crop production. Barges were brought in to dredge channels that ran along the routes of the two streams flowing through the marsh. Nearly a century later, this landscape is being returned back to its original condition. Landowners have signed 31 conservation easements covering 1,700 acres along with 600 publicly owned acres bringing the total of restored land to over 2,300 acres. This is almost 25% of the original marsh area.

Cannon River – Welch Dam Removal (1994)

Originally constructed in the 1890s to power an adjacent mill, the Welch Dam blocked the Cannon River (a Minnesota Wild and Scenic River) for over a century. The dam prevented fish migration, created water quality and sedimentation problems, and posed a safety hazard for paddlers along with being obsolete for approximately 30 years. In 1994, the Minnesota DNR removed the Welch Dam for $46,000, saving an estimated $75,000 from the projected removal estimate. Numerous fish species like muskellunge, flathead catfish, bowfin, longnose gar, mooneye and gizzard shad are now being reported in the 12-mile stretch above the former dam for the first time in decades. The dam removal has also greatly enhanced paddling opportunities and safety conditions at the site. "The removal of the Welch Dam is a perfect example of what can happen to fish. It creates all-new fishing opportunities," said Al Schmidt, a fisheries biologist for the Minnesota DNR (American Rivers, 1999).


Cannon River at Welch

Get Involved

As a resident of the Cannon River Watershed there are many ways for you to get involved to help clean up the water and protect the natural resources. Below are organizations you can get involved with and support.

Cannon River Watershed Partnership

This nonprofit organization strives to engage people to protect and improve the water quality and natural systems of the Cannon River watershed. Volunteers are needed to help with the Annual River Clean-up, serve on the Board of Directors, assist with both stream and lake monitoring, help raise funds for the Cannon River Watershed Partnership, work in the office and promote the organization's various programs.
Contact: Leslie Kennedy, Volunteer Coordinator; 507-786-3915, leslie@crwp.net
Website: http://www.crwp.net

CRWP
Cannon River Watershed Partnership

Minnesota Pollution Control Agency – Stream and Lake Monitoring Programs

Both of these programs provides the tools to help volunteers monitor a favorite stream or lake to help determine its condition, understand water quality issues and promote shared responsibility for the protection of Minnesota's water resources. As a stream monitor you will measure a number of parameters including transparency, appearance, recreational suitability, precipitation and stream stage. Those interested in lakes will collect water transparency data by using a Secchi disk.
Stream Contact: Laurie Sovell; 651-757-2750; http://www.pca.state.mn.us/water/csmp.html
Lake Contact: 651-296-6300; http://www.pca.state.mn.us/water/clmp.html

Minnesota Waters

As a state-wide nonprofit organization, Minnesota Waters is dedicated to protecting and improving the health of the state's lakes and rivers. Minnesota Waters provides the training, connections and support to empower citizens to take action to save the state's lakes and rivers. Contact: 320-257-6630; http://www.minnesotawaters.org/

River Ramblers

This organization is dedicated to leisurely paced river paddling by offering both quiet and whitewater trips. River Ramblers places emphasis on enjoying the great outdoors by encouraging both individual and family involvement. Normally each year there is a number of opportunities to paddle in the Cannon River Watershed. For more information go to www.river-ramblers.org

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