

1999 AND 2000 ANNUAL REPORTS
COMPREHENSIVE LOCAL WATER PLAN

SUBMITTED TO:

Stearns County Board of Commissioners

Stearns County Comprehensive Local Water Plan
Advisory Committee

Area Legislators

SUBMITTED BY:

Stearns County Environmental Services Department

April 2001

LEGEND
1999 AND 2000 ANNUAL REPORTS
COMPREHENSIVE LOCAL WATER PLAN

ADMINISTRATION AND COORDINATION	1
Funding	2
Accomplishments	3
Important Water Planning Related Documents	4
Water Plan Update Process	5
Water Plan Assessment Areas	5
Water Resource Integrity	7
EDUCATION AND INFORMATION	8
MONITORING AND DATA COLLECTION	11
Stearns County Nitrate Testing	12
Stearns County Lake Monitoring Program Summary	13
Summary of Lake Assessment Projects	15
Summary of 1999 Citizen Lake Monitoring Program	17
Summary of Trends From Todd County 1999 Citizen Lake Monitoring Program of Border Lakes With Stearns County	18
Summary of Trend From Wright County 1999 Citizen Lake Monitoring Program of Border Lakes With Stearns County	18
Citizen Lake Monitoring Program	18
Summary of Clean Water Partnership Projects	24
Citizen Stream Monitoring Program	26
INVENTORY AND MAPPING	28

LAND AND WATER TREATMENT	28
Buffer Program	29
REGULATION, ORDINANCES, AND PLANNING	29
Ordinances	29
Planning	30
Wetland Management Issues	34
Wetland Evaluation Tools and Guidance	35

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Stearns County Comprehensive Local Water Plan Organizational Flowchart	1
2	Water Resources Management and the Relationship to Water Planning Efforts	8
3	Minnesota's Ecoregions	14
4	Citizen Stream Monitoring in Minnesota	27
5	City of Melrose Wellhead Protection Area	30
6	City of Cold Spring Drinking Water Supply and Management Area	31
7	City of New Munich Wellhead Protection Area	32
8	Wetland Ecological Units in Minnesota With County Boundaries	35

LIST OF GRAPHS

<u>Graph</u>		<u>Page</u>
1	Landuse in Stearns County by Percent Land Cover	3
2	Workload in Relation to Water Resources	3
3	Transparency of Big Lake Based on Secchi Disk Readings	19
4	Transparency of Cedar Island Lake Based on Secchi Disk Readings	19
5	Transparency of Grand Lake Based on Secchi Disk Readings	19
6	Transparency of Big Fish Lake Based on Secchi Disk Readings	20
7	Transparency of Bolting Lake Based on Secchi Disk Readings	20
8	Transparency of Big Watab Lake Based on Secchi Disk Readings	20
9	Transparency of Knaus Lake Based on Secchi Disk Readings	21
10	Transparency of Horseshoe Lake Based on Secchi Disk Readings	21
11	Transparency of Pelican Lake Based on Secchi Disk Readings	21
12	Transparency of Rice Lake Based on Secchi Disk Readings	22
13	Transparency of North Browns Lake Based on Secchi Disk Readings	22
14	Transparency of Sylvia Lake Based on Secchi Disk Readings	22
15	Transparency of Clearwater Lake Based on Secchi Disk Readings	23
16	Transparency of Caroline Lake Based on Secchi Disk Readings	23
17	Transparency of Big Birch Lake Based on Secchi Disk Readings	23
18	Transparency of Little Birch Lake Based on Secchi Disk Readings	24

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	1999 and 2000 Water Plan Budget	2
2	Costs Associated With Water Plan Related Educational Activities	11
3	Stearns County Nitrate Water Testing Results	12
4	Comparison of Lake TSI With the North Central Hardwood Forest Ecoregion for Lakes Monitored During 1999	15
5	Summary of 1999 Stream Data Collected by Volunteers	26
6	Conservation Structures and Practices Implemented by the Stearns County SWCD During 1999 and 2000	28
7	Acres Enrolled into the 1999 and 2000 Buffer Program	29

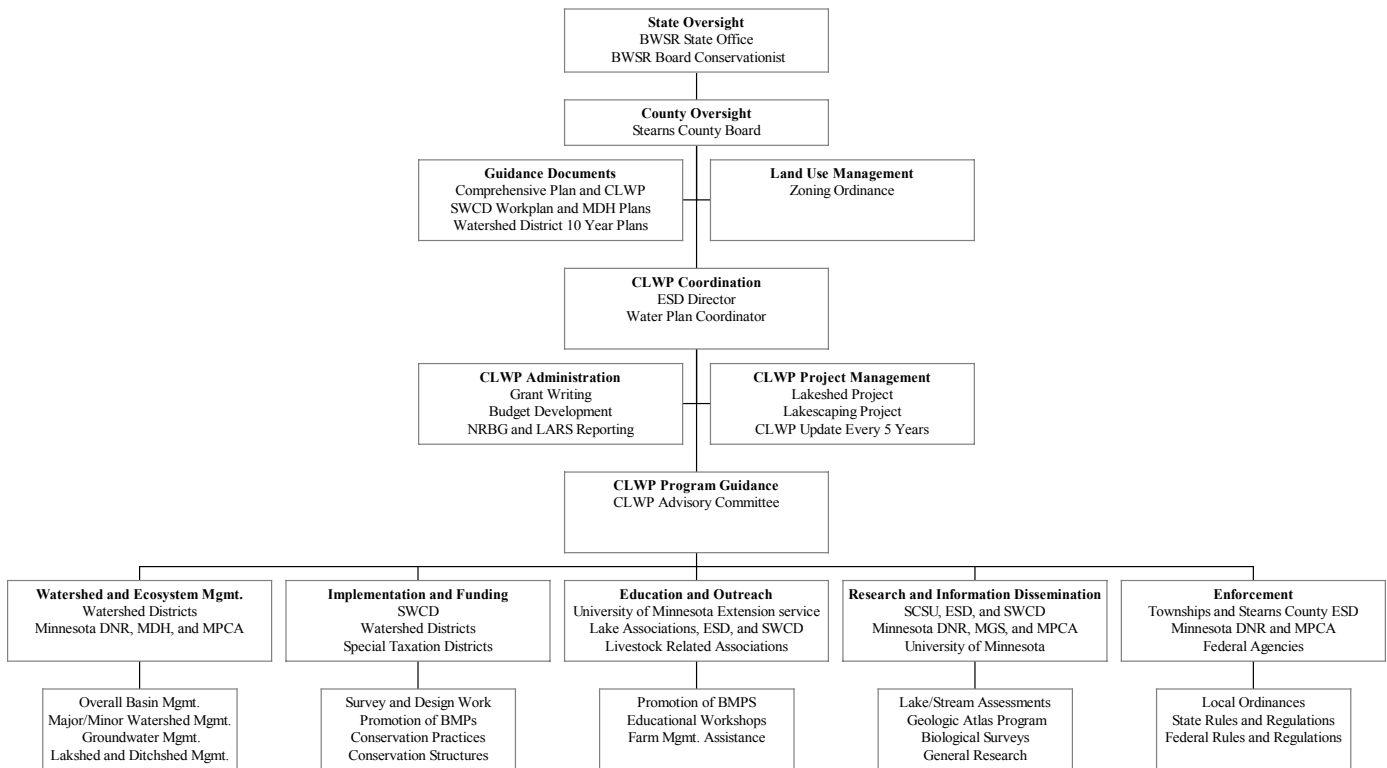
1999 – 2000 ANNUAL REPORTS COMPREHENSIVE LOCAL WATER PLAN

1. ADMINISTRATION AND COORDINATION

The Stearns County Comprehensive Local Water Plan (CLWP) is administered by the Environmental Services Department (Figure 1). During 1999 and 2000, various projects and initiatives were completed and initiated by the Department via the Water Plan Coordinator with assistance from Department staff and other local, state, and federal agencies.

The Department works closely with the Stearns County SWCD, Watershed Districts, municipalities, and townships at the local level regarding natural resources management. Regarding state agencies, the Department cooperates with the Minnesota Board of Water and Soil Resources, Department of Health, Department of Natural Resources, Department of Agriculture, Minnesota Pollution Control Agencies and others to implement the County Water Plan. Regarding federal agencies, the Department partners with the USDA Natural Resources Conservation Service, United States Geological Survey, and others to work towards sustaining the various ecosystems of the County.

Figure 1. Stearns County Comprehensive Local Water Plan Organizational Flowchart



A. Funding

Regarding funding, the Department receives an annual Natural Resources Block Grant (Table 1) from the Minnesota Board of Water and Soil Resources to administer this program. The Department has also received funds in the past via the Challenge Grant process from the Minnesota Board of Water and Soil Resources. In 1999, the Department received a \$30,000 Challenge Grant to promote and develop manure management and planning efforts. As grant funds become available, the Department will apply for funds that correlate to the goals, objectives and actions items identified within the Water Plan pending staff availability, time, and other resources.

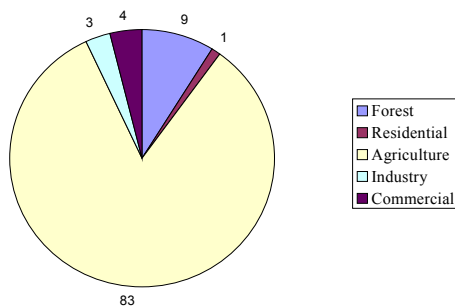
Table 1. 1999 and 2000 Water Plan Budget

	1999	2000
EXPENDITURE	LOCAL WATER PLANNING	LOCAL WATER PLANNING
ADMINISTRATION/ COORDINATION	48,657	10,816
EDUCATION/ INFORMATION	2,000	2,187
MONITORING/ DATA COLLECTION	20,500	15,128
INVENTORY/ MAPPING	5,000	8,124
LAND & WATER TREATMENT	27,000	5,000
REGULATION, ORDINANCES & PLANNING	0	4,532
TECHNICAL STAFF SERVICES	2,000	872
EQUIPMENT/ SUPPLIES	2,000	3,401
TOTALS	107,157	50,060
REVENUE		
1999 and 2000 NRBG	18,750	18,750
MATCH	88,407	31,310
TOTALS	107,157	50,060

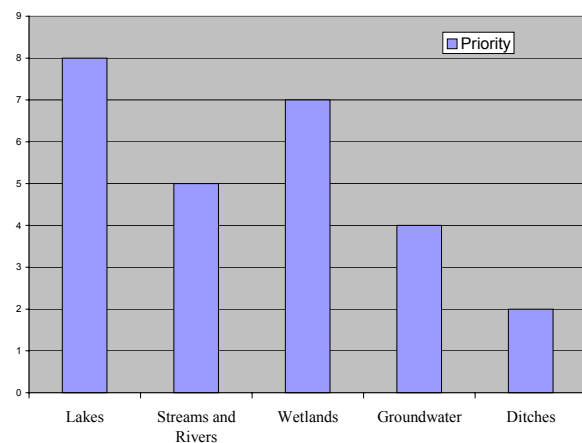
B. Accomplishments

Regarding accomplishments, in 1999 the Minnesota Board of Water and Soil Resources published a report titled, "Comprehensive Local Water Plan - A Decade of Protection – 1989 to 1999". Within this report, each County in Minnesota that had an approved Comprehensive Local Water Plan outlined 10 important accomplishments from 1989 to 1999. The Department has a copy of this document and can be viewed upon request. The significance of this document is that it has been used to illustrate the impact that County water plans have upon the environment to legislators and policy makers. Stearns County accomplishments are outlined below and were based on land-use and workload related issues (Graphs 1 and 2).

Graph 1. Landuse in Stearns County
By Percent Land Cover



Graph 2. Workload in Relation to Water Resources



NOTE: Priorities in Graph 2 are based on a scale of 1 to 10 with 10 being the highest priority.

- A. Initiated the Comprehensive Local Water Plan.
- B. Implemented a feedlot program and completed a feedlot inventory.
- C. Hired additional staff to enforce individual sewage treatment systems and shoreland ordinances.
- D. Established a very effective wetland program.
- E. Completed a county geologic atlas.
- F. Developed a useable GIS database.
- G. Digitized the Stearns County soil survey.
- H. Established a Point of Sale Upgrade Program for individual sewage treatment systems.
- I. Completed training for the Planning Commission and Board of Adjustment and improved their decision making process.
- J. Established good working relationships with townships, cities, watershed districts, and state agencies through the water planning process.

C. Important Water Planning Related Documents

Over the last five years, a number of important Water Planning related documents have been published by various agencies. These documents provide guidance to local natural resources managers when prioritizing projects/initiatives to implement conservation practices, structures, and Best Management Practices based on a minor watershed approach. The following is a list of these documents:

State of Minnesota Documents:

1. Upper Mississippi River Basin Information Document 2000.
2. Minnesota Watermarks – Gauging the Flow of Progress (2000 – 2010).
3. Preparing for Minnesota Water Plan 2000 (Environmental Quality Board)
4. Comprehensive Local Water Planning – A Decade of Protection (1989 – 1999).
5. Soundings – A Minnesota Water Plan Assessment (1998 - Environmental Quality Board).
6. Minnesota Water Plan (1991).
7. MPCA Non-point Pollution Manual (1994).
8. The State of Watershed Water Quality Management in Minnesota (1997).
9. MPCA Five Year Strategic Plan (FY 2000 to 2004).
10. DNR Strategic Plan (2001).

Stearns County Documents:

1. Stearns County Comprehensive Local Water Plan.
2. Stearns County Comprehensive Plan.
3. Stearns County Zoning Ordinance.
4. Stearns County SWCD plan.
5. Watershed District plans.

D. Water Plan Update Process

In late 2000, the Department initiated the update of the existing Water Plan. Areas of importance include surface waters, land use, and groundwater based on a watershed context. Water Planning issues (designated as assessment areas) that will be incorporated into the updated version are listed on pages 5 and 6. A draft of this updated document will be available on July 1, 2001 to the general public and local, state, and federal agencies. The Department is also in the process incorporating Watershed District 10-year implementation plans within the Water Plan.

Water Plan Assessment Areas

- A. Surface water quantity information for present and future uses.
Purpose: To assess the implications of the surface water quantity information for present and future water and land uses.
- B. Ground water quantity information for present and future uses.
Purpose: To assess the implications of the ground water quantity information for present and future water and land uses.
- C. Surface water quality information for present and future uses.
Purpose: To assess the implications of the ground water quality information for present and future water and land uses.
- D. Ground water quality information for present and future uses.
Purpose: To assess the implications of the ground water quality information for present and future water and land uses emphasizing health-related impacts.
- E. Sedimentation and impacts on quality and quantity of surface water.
Purpose: To assess the implications of sedimentation for watercourses, water basins, ditches and wetlands.
- F. Affect of land use and cover on quality and quantity of run-off (by watershed).
Purpose: To assess the quantity and quality of run-off by watershed as related to land use and land cover.
- G. Irrigation's impact for present and future uses.
Purpose: Having more than 1,000 acres of irrigated land in any one township indicates a heavy use of irrigation in one location (a township). To assess the implication for present and future land and water use.
- H. Effects of ditch systems on water quantity and quality.
Purpose: To assess whether there is any significant water quality and quantity effects due to public or private ditch systems.

- I. Pollutant sources, relation to present and future water and land uses.
Purpose: To assess the implications of pollutant sources for present and future water and land uses.
- J. Special geologic conditions and relation to present and future water and land uses.
Purpose: To assess the implications of special geologic conditions and relation to present and future water and land uses.
- K. Wetlands and relation to present and future water and land uses.
purpose: To assess the implication of wetlands for present and future water uses.
- L. Adequacy and enforcement of existing floodplain ordinances.
Purpose: To assess the adequacy and enforcement of existing floodplain ordinances.
- M. Adequacy and enforcement of shoreland ordinances.
Purpose: To assess the adequacy and enforcement of existing shoreland ordinances.
- N. Adequacy of water-base recreation lands for present and future uses.
Purpose: To assess the adequacy of water-based recreational lands for present and future use.
- O. Adequacy of fish and wildlife habitat for present and future uses.
Purpose: Because fish and wildlife can add so much to the quality of life, it is important to consider the adequacy of habitat as it may be related to water quality and quantity. To assess the adequacy of fish and wildlife habitat for present and future use.
- P. Unique features and scenic areas relation to present and future water and land uses.
Purpose: To assess the implications of the unique features and scenic areas for present and future water and land use.
- Q. Expected changes to surface or ground water and related land resources.
Purpose: To assess the probability and effect of potential changes to its water resources, a county must list, consider, and describe the impacts on those resources from the following areas of potential change:
- Changes to the physical environment, land use, and development.
 - Special land and water uses or conditions, and trends within or without the county that might affect a county's water and related land resources.
 - The influence of existing programs on water and related land resources and the administrative, technical, and financial capability of the county to develop and implement new programs.

R. Expected changes to physical environment, land use, and development.

Purpose: Information about the original vegetation points out the extent to which the physical environment has already changed. The county examines the changes expected in the futures. Identify and describe the changes that are expected within the timeframe of the plan and that will have significant effects on water resources.

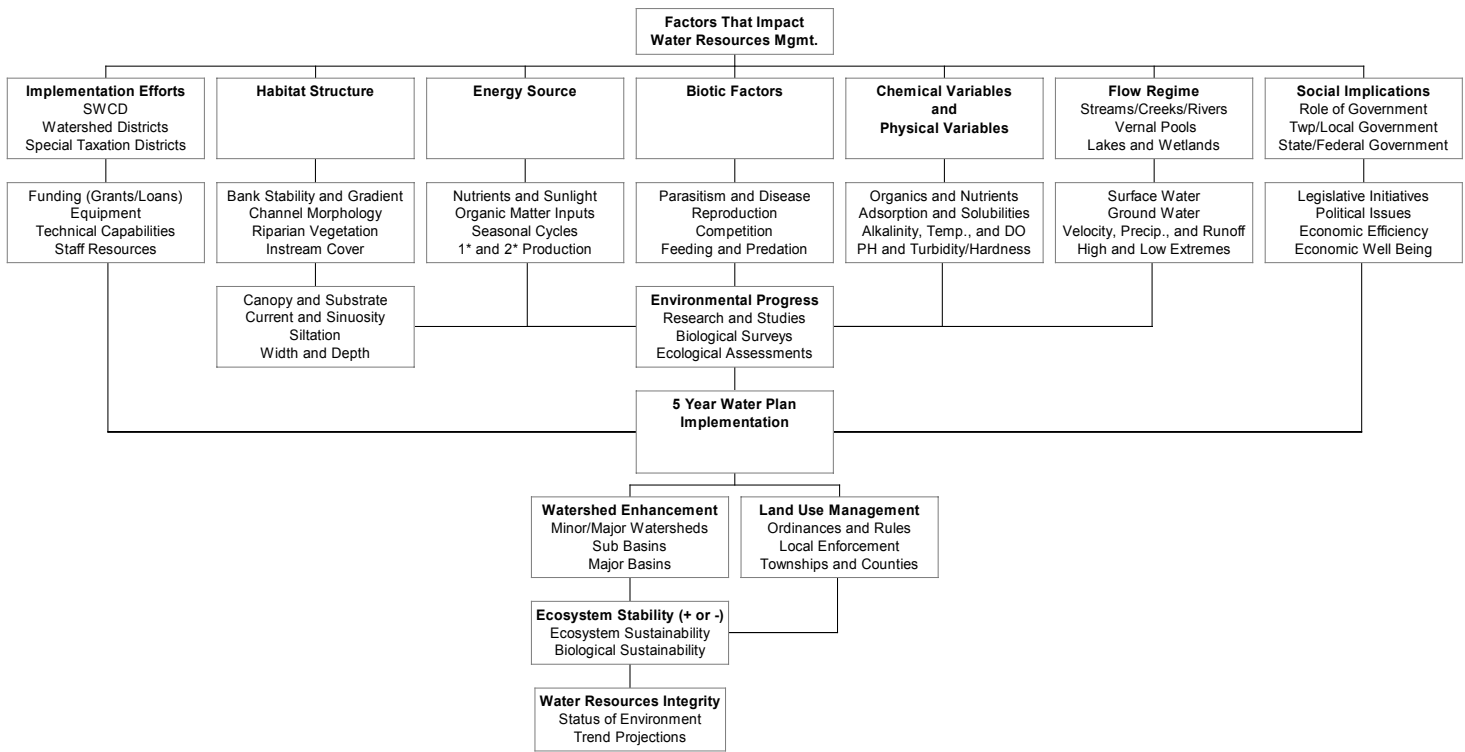
E. Water Resource Integrity

Water resources management is impacted by many factors, which includes but is not limited to chemical variables, flow regime, biotic factors, energy sources, habitat structure, and social inputs (Figure 2). The management of water resources has primarily been surface water related in the past. However, with the water plan update in progress, groundwater issues will be renewed or refocused.

Future water planning efforts will be focused on a minor or major watershed approach. Ecosystem type also will have an influence upon water resources management within watersheds. One method that has been developed and implemented in 2000 by the Department, SWCD, and Minnesota Department of Natural Resources to further determine the impacts of land-use upon water resource integrity is the Lakeshed Study.

The Lakeshed study is an in-depth view of lakes and other surrounding watersheds to identify opportunities for water quality improvements. Six lakes were studied during 2000 and include Lake Maria, Sand Lake, Big Fish Lake, Big Watab Lake, Eden Lake, and North Browns Lake. Past and current land-uses were compared and two seasonal employees worked cooperatively to gather and compile data. This study will continue in 2001.

Figure 2. Water Resources Management and the Relationship to Water Planning Efforts, Adaptation From Karr et al. 1986



2. EDUCATION AND INFORMATION

A number of educational activities were conducted during 1999 and 2000. Education and the dissemination of information is one of the primary focus areas of the Water Plan. Education leads to better understandings of ecosystem processes, Best Management Practices (BMPs), and a higher level of ownership regarding private landowners and the general public. Costs associated with these activities are illustrated in Table 2 at the end of this section.

A. 2000 Cold Spring Water Festival

The purpose of this Festival was to provide education to fourth grade students regarding surface and ground water quality and quantity related issues. The result was that fourth grade students will be more aware of water related issues and will be able to better understand the importance of water quality.

B. 2000 Drinking Water Awareness Days

The purpose of the 6 clinics that were held was to educate landowners regarding drinking water quality and to gather general information regarding groundwater quality within Stearns County. The result was that private citizens are more aware of nitrate levels in the water that they use for drinking and other domestic uses.

C. Facilitation of Water Plan Meetings (2000)

The County hired a facilitator from the University of Minnesota Extension Service to guide the CLWP Advisory Committee in the early stages of the CLWP update, which is scheduled to be completed by July 1, 2001. The result is that CLWP Advisory Committee members now have a better understanding of their roles during the CLWP update. The University of Minnesota Extension Service facilitator also assisted with planning sessions to determine the progress that was made from 1995 to 2000 and provided guidance regarding updating existing goals, objectives, and action items. The CLWP Advisory Committee also implemented monthly meetings to focus on the update.

D. 2000 Geologic Atlas Workshop

The purpose of this workshop was to disseminate information collected during the development of the County Geologic Atlas. This was a two-day workshop with the second day being an all day field trip to view geologic formations in Stearns County. The result was that local, state, and federal agencies and the general public will have a better understanding of the geology of Stearns County.

E. 2000 Lake Day

The purpose of Lake Day was to educate lakeshore owners with new Best Management Practices and technology regarding stabilizing lakeshore areas and to discuss the importance of not altering shoreline areas. The result was that lakeshore owners will have a better understanding of the importance of high quality shoreline areas and the impacts of development on lake ecosystems. This was the most successful event of this kind as 140 people were in attendance.

F. 2000 SCSU Wetland Presentation

The purpose of this presentation was to make college students more aware of The Minnesota Wetland Conservation Act and how wetland regulations are implemented in Stearns County. College students are now more aware of the WCA program and how wetland ecosystems are managed in Stearns County.

G. 2000 Sauk River Valley Wastewater Treatment Partnership

The Sauk River Valley Wastewater Treatment Partnership is an initiative being implemented to develop a sewage waste collection system for a number of lake ecosystem areas within Stearns County. The result will be enhanced water quality via reduced nitrates and phosphorus in lake ecosystems.

H. 2000 Shoreland Contractor Workshop

The purpose of this workshop was to educate shoreland contractors regarding local and state shoreland regulations and to provide new information regarding shoreland Best Management Practices and new shoreline stabilization technology. The result was that shoreland contractors will be better able to complete projects using new Best Management Practices and technology thus resulting in higher quality ecosystem stabilization projects. This workshop was developed based on the licensing requirements in the zoning ordinance for shoreland contractors.

I. 2000 Shoreland Revegetation Workshop

The purpose of this workshop was to educate shoreland owners with the proper methods to re-vegetate their shoreland areas. The result was that shoreland areas will be stabilized with approved methods (lakescaping/aesthetically) and technology to re-vegetate shoreland areas. Also, shoreland owners will have a better understanding of their impacts upon water quality when working in shoreland areas and when native vegetation is removed.

J. 2000 Shoreland Sponsorships

The purpose of this initiative was to educate University of Minnesota Extension Service shoreland volunteers in shoreland regulations and Best Management Practices. The result was that shoreland volunteers will act as mentors to educate other shoreland owners regarding shoreland Best Management Practices and stabilization techniques.

K. 2000 Stearns County Environmental Education Day

The purpose of this educational day was to educate fifth and sixth grade students in various environmental issues. The result was that these students will have a better understanding and appreciation of ecosystems and the environment. Approximately 400 students attended this event.

L. 1999 Lake Day

The purpose of this Lake Day was to educate lakeshore owners with new Best Management Practices and technology regarding stabilizing lakeshore areas and to discuss the importance of not altering shoreline areas. The result was that lakeshore owners will have a better understanding of the importance of high quality shoreline areas and the impacts of development on lake ecosystems.

Table 2. Costs Associated With Water Plan Related Educational Activities

Item:	Hard Cash Match:	Source of Match:	In-Kind Match:	Source of Match:	Total Funds:
Water Festival	\$452.41	Cold Spring	\$1,200.00	County/SWCD	\$1,652.41
Drinking Water Day			\$7,500.00	MDH/SWCD	\$7,500.00
Facilitator	\$816.00	County			\$816.00
Geologic Atlas Wksp.	\$771.00	County	\$4,900.00	DNR/SWCD	\$5,671.00
2000 Lake Day	\$500.00	County	\$5,900.00	County/MLA SWCD/UMES	\$6,400.00
1999 Lake Day	\$500.00	County		County/MLA SWCD/UMES	\$500.00
Wetland Presentation			\$300.00	County	\$300.00
Sauk River Valley WWTP	\$3,000.00	County			\$3,000.00
Contractor Workshop			\$1,800.00	County/MNDOT, SWCD/UMES	\$1,800.00
Re-vegetation Wksp.			\$3,000.00	County/SWCD/ UMES	\$3,000.00
Shoreland Sponsors	\$100.00	County			\$100.00
Education Day			\$1,440.00	County/SWCD UMES	\$1,440.00
Total:	\$6,139.41		\$26,040.00		\$32,179.41

Note: This data is based on information provided to the Minnesota Board of Water and Soil Resources via the Local Area Reporting System (LARS). This data may not accurately represent the budget on page 2 of this report.

3. MONITORING AND DATA COLLECTION

Over the past two years, there have been a number of monitoring efforts implemented by various local, state, and federal agencies within Stearns County that are important components of the Water Plan. As part of the Water Plan update process, all relevant data has been summarized and will be included within the updated document. Stearns County also conducts groundwater monitoring at several locations within the County. Data and laboratory results from this groundwater monitoring initiative are part of the Environmental Health Division 1999 and 2000 annual reports.

A. Stearns County Nitrate Testing

The Stearns County SWCD in conjunction with the Minnesota Department of Agriculture has sponsored groundwater testing for nitrates free of charge to private well owners from 1995 to 2000 (Table 3). The purpose of this program is to provide information to landowners regarding the quality of the groundwater that is being used for drinking water and other domestic uses. This program is non-regulatory and is an excellent opportunity for local natural resources managers to discuss water quality with private well owners and private landowners.

Table 3. Stearns County Nitrate Water Testing Results

<u>Year</u>	<u>Site</u>	<u>Total No.Sam.</u>	<u>Max (ppm)</u>	<u>Median (ppm)</u>	<u>Samples Greater than 10 ppm (%)</u>
1995	Kimball	150		0.9	15.0
1995	Paynesville	133		0.7	11.0
1995	Waite Park	209		0.8	22.0
1995	Melrose	184		0.5	18.0
1995	Cold Spring	49		0.5	10.0
1995	Holdingford	50		0.4	4.0
Total		775		0.6	13.3
1996	Cold Spring	449		1.2	13.0
1996	Belgrade	111		1.0	20.0
Total		560		1.1	16.5
1997	Kimball	50	27	0.0	8.0
1997	Brockway Twp.	62	13	0.1	3.0
1997	Paynesville	91	19	0.0	1.0
1997	Brooten	48	73	0.1	23.0
1997	Cold Spring	114	35	0.2	10.0
1997	Waite Park	103	18	0.1	8.0
1997	Greenwald	45	39	4.7	22.0
1997	St. Martin	66	52	2.3	24.0
1997	Sauk Centre	110	57	0.1	23.0
1997	Albany	144	17	0.0	5.0
Total		833	35	0.8	12.7

Table 3 Continued:	Site:	Total No.Sam.	Max (ppm)	Median (ppm)	Samples Greater than 10 ppm (%)
1998	Holdingsford	91	26	0.8	16.0
1998	Avon	111	27	0.0	7.0
1998	Rockville	140	29	0.9	10.0
1998	Freeport	48	28	0.0	10.0
1998	Elrosa	53	27	0.0	6.0
1998	St. Cloud	97	33	0.2	6.0
Total		540	28.3	0.3	9.2
1999	Albany	103	34	0.0	11.0
1999	Paynesville	58	51	0.3	10.0
1999	Waite Park	153	48	1.4	9.8
1999	Cold Spring	76	13	0.2	6.6
Total		390	36.5	0.5	9.4
2000	St. Augusta	59	16	0.0	3.4
2000	Kimball	54	36	0.0	5.6
2000	Cold Spring	76	46	1.0	10.5
2000	Waite Park	59	25	0.0	5.1
2000	Belgrade	56	32	0.0	7.1
2000	Melrose	189	28	0.4	3.0
Total		493	30.5	0.2	5.8

Five Year Summary

Total Samples (#)	Five Year Maximum Sample (ppm)	Five Year Median Sample (ppm)	Average Samples Greater than 10ppm (%)
6407	32.6	0.6	11.2

B. Stearns County Lake Monitoring Program Summary

During 1999 and 2000, the County contracted with St. Cloud State University to study 6 lakes per year within the County. This effort was initiated with the assistance of the Department, SWCD, and others and Charles Rose, Sharon Doucette (student), and Dr. Neal Voelz of St. Cloud State University.

Lakes are an important resource in Minnesota (and Stearns County) for many reasons including recreation, fishing, and aesthetics. Lakes also have an effect on the property value of surrounding land. Lakes which were perceived as “cleaner” because of higher water clarity also had the highest property values of land surrounding the lake. There is a need to obtain baseline data with which to assess these resources on a continuing basis. Part of the Stearns County Water Planning Board’s implementation of the water plan is to assess lakes on a rotating basis, six lakes a year for five years (30 lakes total), then revisit the lakes in order to determine water quality changes. Volunteer citizen data are being used to (less intensively) monitor the lakes between intensive studies.

During 1999 and 2000, twelve Stearns County lakes were sampled for temperature and dissolved oxygen profiles, as well as water quality at two sites per lake each month from June to September. The lakes (listed in Table 4) were selected in 1999 to cross a range of water quality conditions and in 2000 because of the rapid urban development surrounding those lakes. Water quality was assessed using three standard limnological measurements: Secchi disk depth, total phosphorus, and chlorophyll-a.

These three measurements are commonly placed on a 0-100 scale called Carlson’s Trophic State Indexes (TSI); lower numbers indicate clear, low nutrient lakes while higher numbers signify high nutrient lakes clouded with algae. When available, all these indexes can be averaged to produce an overall TSI value. Nearly all Minnesota lakes fall between 40 and 80 on this scale. This index was developed in Minnesota and is widely used by educational, government, and private institutions.

Stearns County is part of the North Central Hardwood Forest Ecoregion area of Minnesota (Figure 3). This ecoregion also has fertile soils (and therefore relatively high nutrient water) with agriculture being a dominant land use. A typical lake in this ecoregion can be expected to be eutrophic. The Minnesota Pollution Control Agency has determined the range of trophic state conditions typical of this ecoregion and has determined percentiles based on the data collected.

Figure 3. Minnesota’s Ecoregions

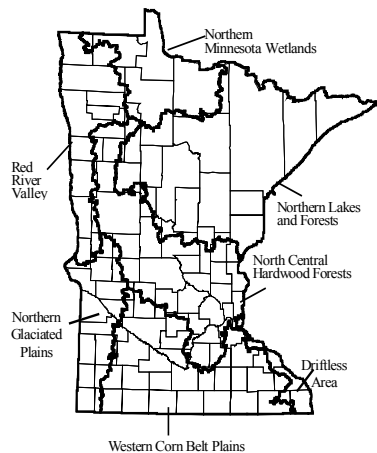


Table 4 shows that Big Watab and Big Fish lakes represent some of the clearest, lowest nutrient lakes in the ecoregion. Pine, Pelican, and the three lakes in the Spunk chain also have above average water clarity. Hypereutrophic Sand Lake's TSI is near the lower end of the percentiles for this region, while the remaining eutrophic lakes are more typical of the region. It is also hoped that by also assessing land use practices within the watersheds of these lakes, potential problems affecting the TSI values of these lakes can be identified and corrected resulting in maintenance or improvement of their water quality in the future.

Table 4. Comparison of Lake TSI With the North Central Hardwood Forest Ecoregion Data for Lakes Monitored During 1999 (Upper Section) and 2000 (Lower Section) Based on Minnesota Pollution Control Agency Data.

Lake	Average TSI	Estimated percentile	Trophic State
Big Watab	41	95	Mesotrophic
Big Fish	44	90	Mesotrophic
North Browns	59	44	Eutrophic
Eden	60	40	Eutrophic
Maria	61	38	Eutrophic
Sand	71	20	Hypereutrophic
Middle Spunk	48	75	Mesotrophic
Pelican	48	75	Mesotrophic
Big Spunk	50	67	Mesoeutrophic
Lower Spunk	52	63	Eutrophic
Pine	54	56	Eutrophic
Two Rivers	61	38	Hypereutrophic

C. Summary of Lake Assessment Projects

Horseshoe Chain of Lakes

The Horseshoe Chain of Lakes (also known as Sauk River Chain of Lakes) was the subject of a Lake Assessment Project in 1995, resulting in a cooperative sampling effort by the MPCA, Sauk River Watershed District, Stearns County Environmental Services, and Sauk River Chain of Lakes Association

The Horseshoe Chain of Lakes is an assemblage of several lake basins. The total acreage of all lakes in the chain is about 2,375 acres, with a mean depth of 11 feet. The Horseshoe Chain of Lakes has a watershed of approximately 940 square miles, which results in a large watershed to lake ratio of about 254:1. Lakes with large watersheds relative to lake size are often characterized by short water retention times and high phosphorus loading. The estimated average water residence time is in the range of 26-36 days.

The Melrose wastewater treatment facility was upgraded in 1991. The upgrade reduced phosphorus loading from 15-20 mg/L down to 1mg/L, or less. As a result, phosphorus-loading rates to the river declined from 455 pounds per day to about 17 pounds per day (Cook et al. 1992). Other communities, including Sauk Center, Richmond, and St. Martin have instituted phosphorus controls as a part of National Pollutant Discharge Elimination System permits as well.

Total phosphorus concentrations were high in the Chain as compared to the reference lakes for this ecoregion. Total phosphorus concentrations in Horseshoe and Cedar Lakes averaged 118 (+/- 17) and 84 (+/- 17) $\mu\text{g/L}$ respectively. Zumwalles, a shallower lake, had total phosphorus concentrations of 208 $\mu\text{g/L}$. A typical lake has total phosphorus of 23-50 $\mu\text{g/L}$.

The chlorophyll-a readings were also much higher than the typical range for lakes in this ecoregion, with a mean of 58 $\mu\text{g/L}$ in Horseshoe, 71 $\mu\text{g/L}$ in Cedar, and 77 $\mu\text{g/L}$ in Zumwalles, compared to a concentration of 5-22 $\mu\text{g/L}$ for a typical lake. Secchi transparencies were low in the chain compared to the typical lakes in this ecoregion also, ranging from a low of 1.3 feet in Zumwalles to 4.3 feet in Horseshoe Lake. The typical range for lakes in this ecoregion are 4.9-10.5 feet. The total phosphorus, chlorophyll-a, and Secchi measurements are indicative of hypereutrophic conditions.

Although the Chain is characterized as hypereutrophic, the major reductions in phosphorus loading to the Sauk River have resulted in significant declines in total phosphorus concentrations in Horseshoe, East and Cedar Island Lakes. Reductions in in-lake phosphorus have resulted in nonsignificant declines in chlorophyll-a and nonsignificant increases in Secchi transparency for most of the lakes in the chain. The reductions in total phosphorus have occurred in spite of the high river flows that have characterized the years following the upgrades (1991-1995). Most likely there would have been more dramatic reductions in phosphorus in average to low-flow years when non-point source loading would be less significant.

In comparisons of in-lake data for “pre” and “post” Melrose upgrade years in Horseshoe Lake there was a statistically significant decline in total phosphorus in all three basins. “Post” upgrade phosphorus concentrations were about half “pre” phosphorus concentrations in each basin. There were nonsignificant declines in chlorophyll-a and nonsignificant increases for Secchi disc data in each basin. Examination of the chlorophyll-a data for all three basins suggested a reduction in frequency and intensity of severe nuisance blooms in the “post” years compared to the “pre” years. Data on hypolimnetic phosphorus was inconclusive, although there was some evidence that the phosphorus levels may be declining over time. Dissolved oxygen profiles were also inconclusive.

Dramatic reductions in point source loading has led to significant improvement in water quality in the Horseshoe Chain of Lakes. The Lake Assessment Program report recommends that attention should now be placed on reductions in nonpoint source phosphorus loading and any other significant point sources in the watershed. The report also recommends continued Citizen Lake Monitoring Program monitoring at existing sites as well as expanded monitoring to other lakes in the chain and comprehensive in-lake monitoring every two or three years.

Pearl Lake

Pearl Lake was also the subject of a Lake Assessment Project. Pearl Lake is a very shallow lake with an area of 759 acres, mean depth of 9.9 feet, and a maximum depth of 17 feet with a watershed area lake surface ratio that is 15 to 1. The estimated average water residence time is about 1.5 years.

The MPCA sampled this lake in 1995 and in 1997. Total phosphorus and chlorophyll-a were in the range of that exhibited by the other reference lakes in the ecoregion range, and the Secchi transparency was just outside of ecoregion (worse) at 4.3 feet. The Carlson Trophic State Index classified Pearl Lake as eutrophic. Summer-mean total oxygen concentration was 34 µg/L, chlorophyll-a was 15 µg/L, and Secchi transparency averaged 4.3 feet.

The lake's trophic status would be characterized as mildly eutrophic, and would rank the lake at the 54th percentile of lakes in this ecoregion. Based on the observed total phosphorus (34 µg/L), user perceptions, models results and phosphorus criteria for the North Central Hardwoods Forest Ecoregion (<40 µg/L), a reasonable goal for Pearl Lake would be on the order of total phosphorus of 35 (+ or – 5) µg/L. At or below this level, nuisance blooms would be predicted to occur 20 percent or less of the summer.

Pearl Lake is sensitive to nutrient input because it is shallow and has a large watershed. It appears that a significant portion of the phosphorus load from the predominately agricultural watershed is trapped in upstream lakes, wetlands, and other low areas in the watershed. The 1997 water quality condition of Pearl Lake was good relative to other lakes in this ecoregion. However, further increases in nutrient loading from any watershed or in-lake sources can further degrade the lake.

The Lake Assessment Program report recommended that the Pearl Lake Association should develop a plan for protecting the water quality of the lake, continue to participate in the Citizen Lake Monitoring Program, and take steps to assure that further development or land use changes in the lake's watershed should occur in a manner that minimizes water quality impacts to the lake. The Lake Assessment Program set a goal of summer-mean phosphorus concentrations of 35 (+ or – 5) µg/L or less.

D. Summary of 1999 Citizens Lake Monitoring Program

Lakes Exhibiting a Positive Trend

Big	12 Years of Monitoring	Strong Positive Trend
Cedar Island (Main Bay)	10 Years of Monitoring	Strong Positive Trend
Grand	15 Years of Monitoring	Strong Positive Trend
Big Fish	14 Years of Monitoring	Moderate Positive Trend
Bolting	13 Years of Monitoring	Weak Positive Trend

Lakes Exhibiting a Negative Trend - None

Lakes Exhibiting No Trend

Big Watab	13 Years of Monitoring
Knaus	12 Years of Monitoring
Horseshoe	19 Years of Monitoring
Pelican	17 Years of Monitoring
Rice	17 Years of Monitoring
North Browns	9 Years of Monitoring

E. Summary of Trends From Todd County 1999 Citizen Lake Monitoring Program of Border Lakes With Stearns County

Lakes Exhibiting a Positive Trend - None

Lakes Exhibiting a Negative Trend - None

Lakes Exhibiting No Trend

Sauk (SW Bay)	10 Years of Monitoring
Sauk (N Bay)	9 Years of Monitoring
Big Birch	22 Years of Monitoring

F. Summary of Trends From Wright County 1999 Citizen Lake Monitoring Program of Border Lakes With Stearns County

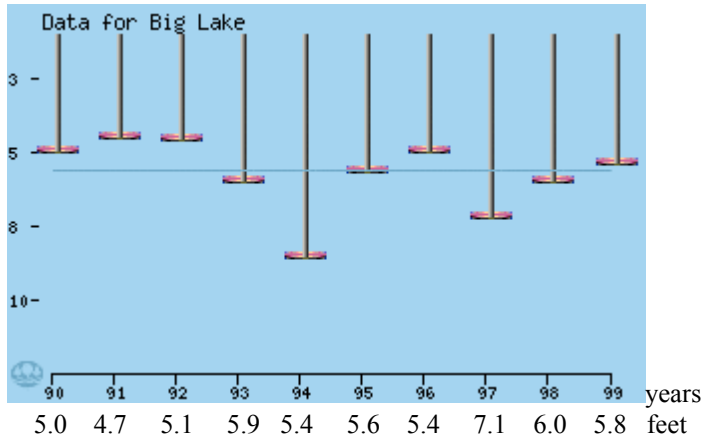
Lakes Exhibiting a Positive Trend

Sylvia	22 Years of Monitoring	Strong Positive Trend
Clearwater	24 Years of Monitoring	Weak Positive Trend

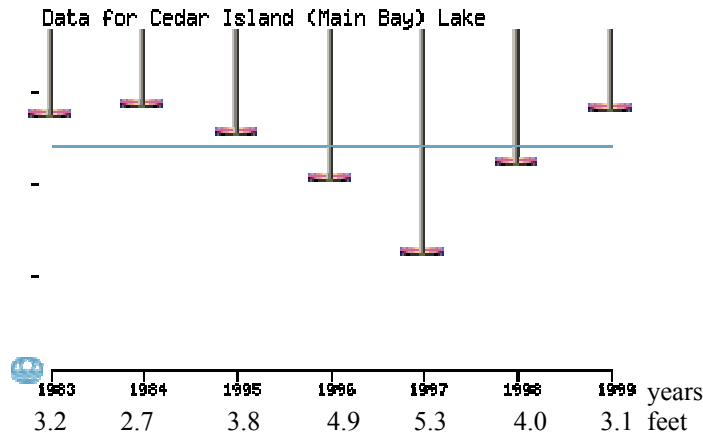
G. Citizen Lake Monitoring Program

The following graphs represent Secchi transparency data collected by volunteers in the Citizen Lake Monitoring Program (Graphs 3 through 16). All values are expressed in units of feet. The long-term mean for each lake is represented by a horizontal line on the graph. Lakes that have little or no Secchi data are not shown. The CLWP Advisory Committee promoted the establishment of CLWP volunteers on all 36 lakes designated in the St. Cloud State University monitoring program.

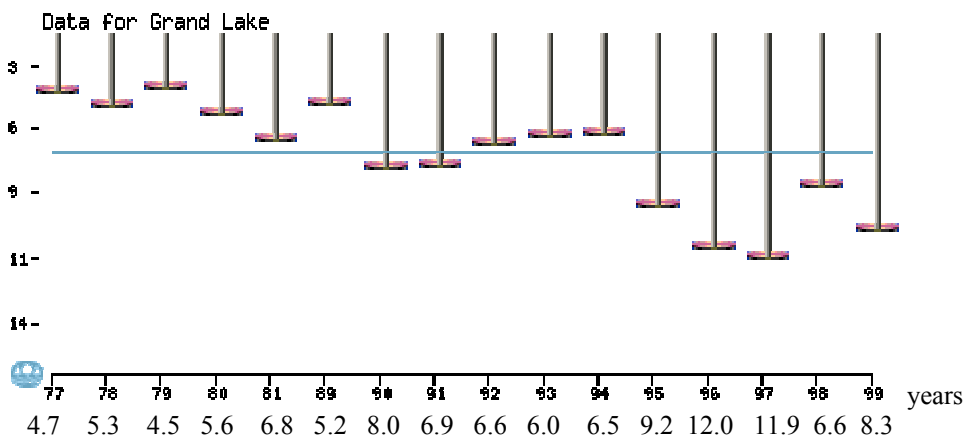
Graph 3. Transparency of Big Lake Based on Secchi Disc Readings



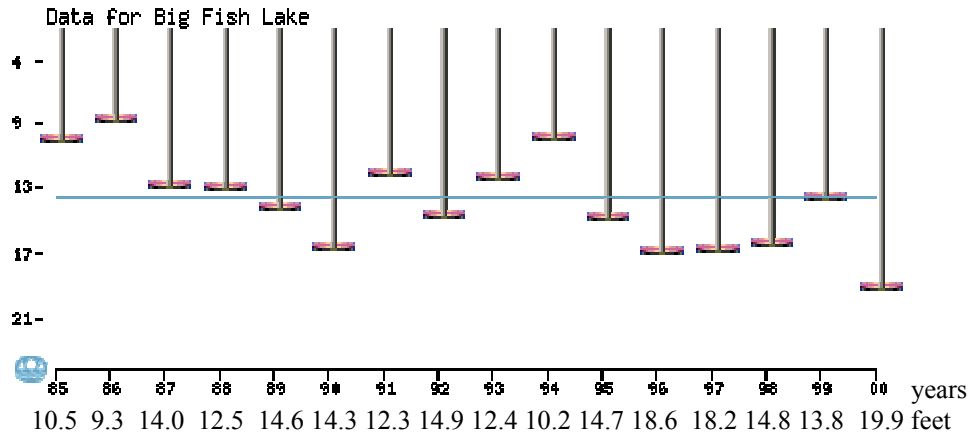
Graph 4. Transparency of Cedar Island Lake Based on Secchi Disc Readings



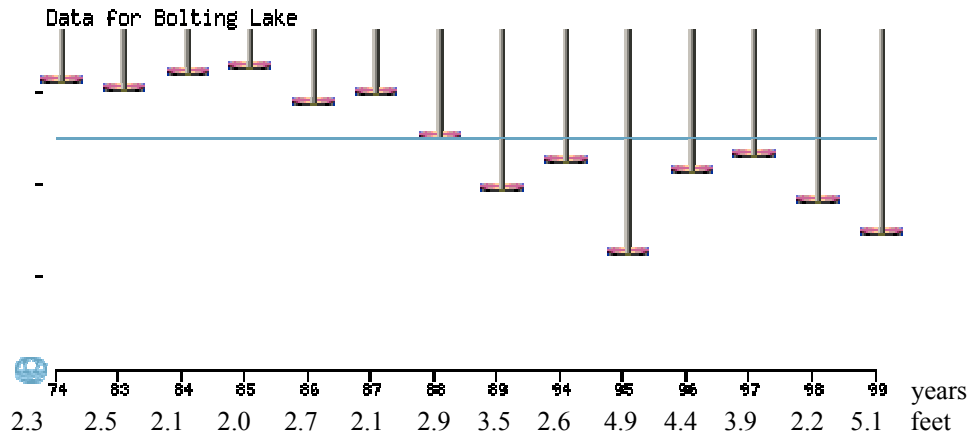
Graph 5. Transparency of Grand Lake Based on Secchi Disc Readings



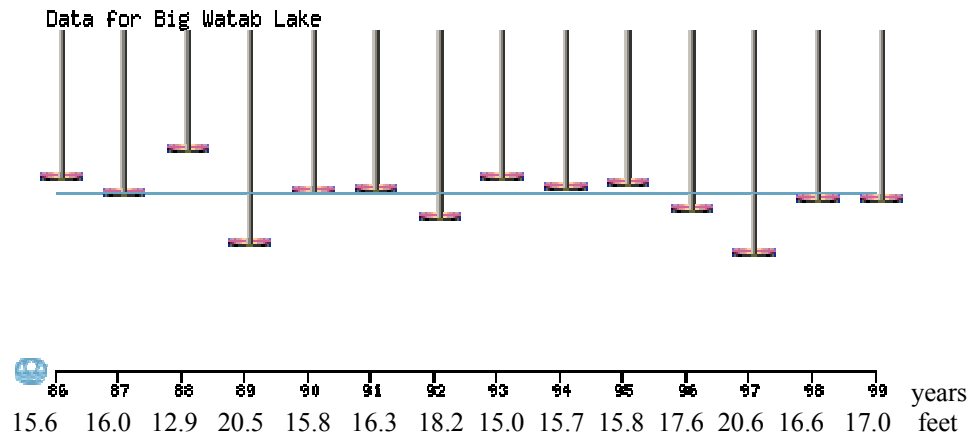
Graph 6. Transparency of Big Fish Lake Based on Secchi Disc Readings



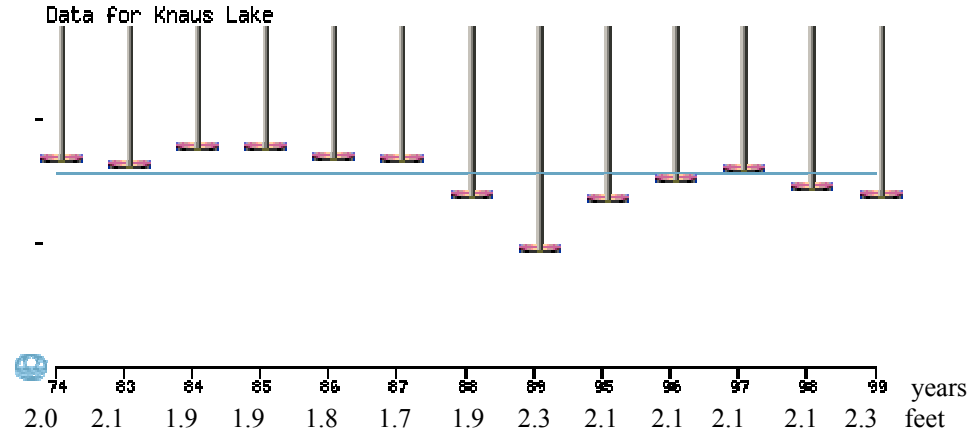
Graph 7. Transparency of Bolting Lake Based on Secchi Disc Readings



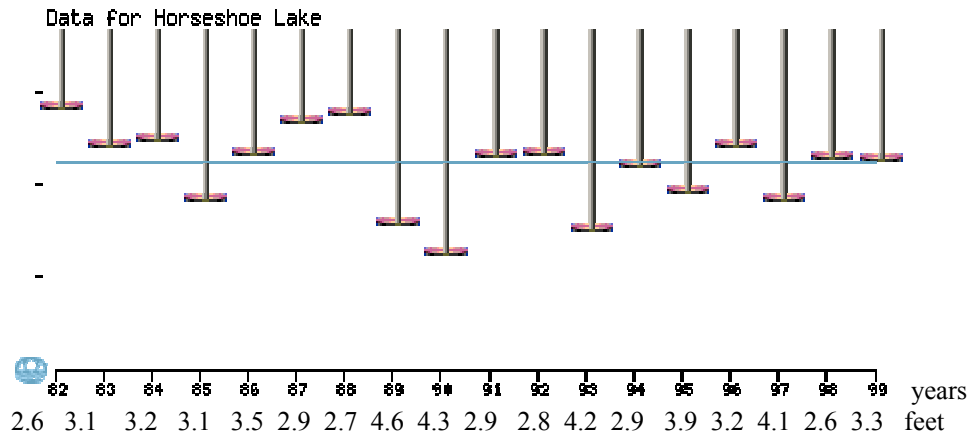
Graph 8. Transparency of Big Watab Lake Based on Secchi Disc Readings



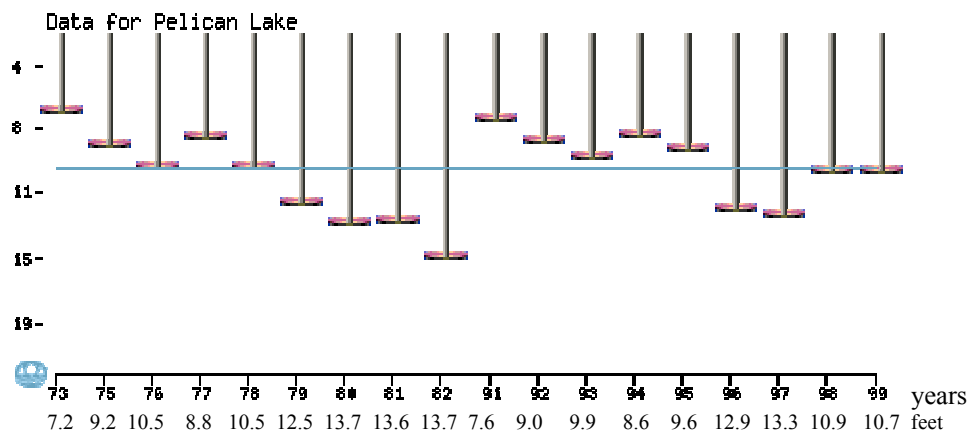
Graph 9. Transparency of Knaus Lake Based on Secchi Disc Readings



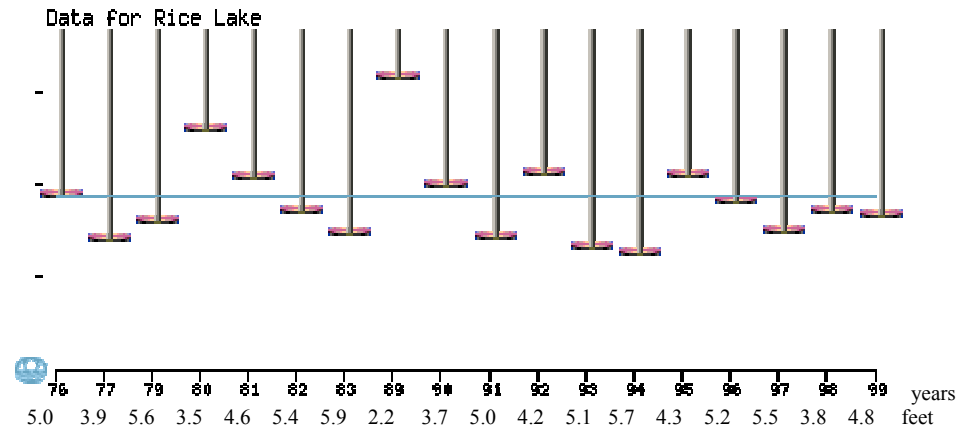
Graph 10. Transparency of Horseshoe Lake Based on Secchi Disc Readings



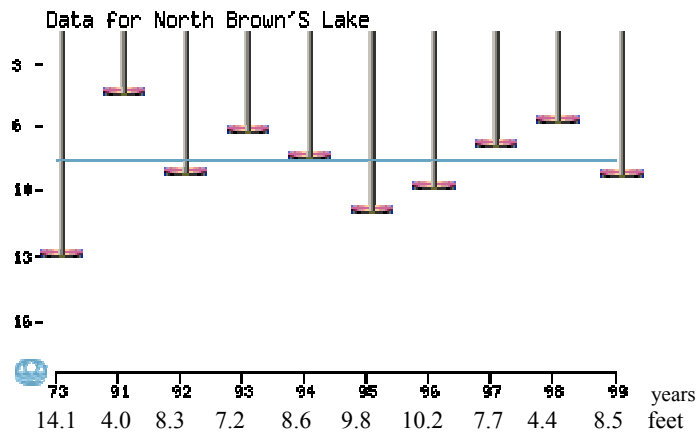
Graph 11. Transparency of Pelican Lake Based on Secchi Disc Readings



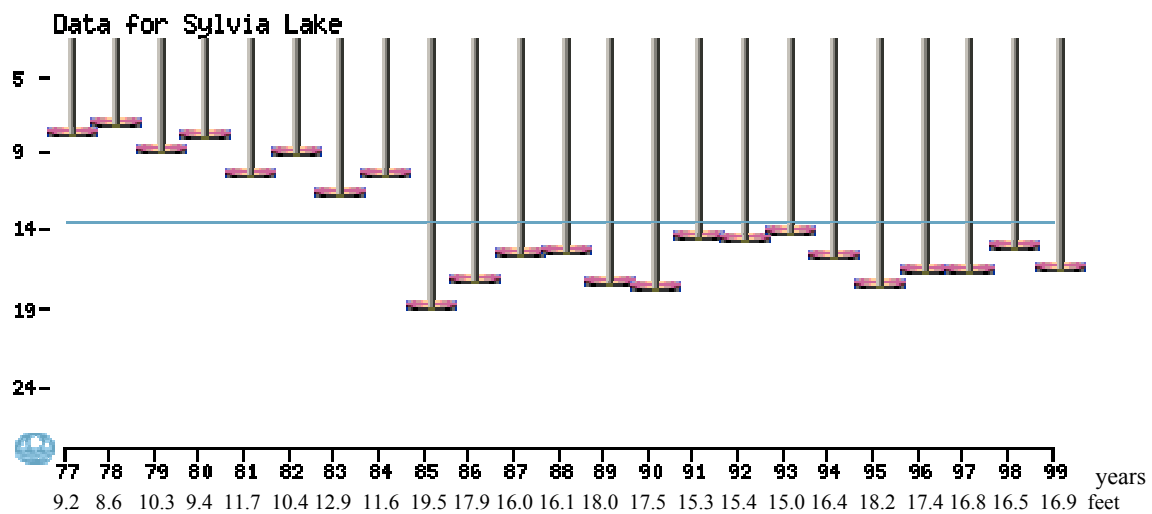
Graph 12. Transparency of Rice Lake Based on Secchi Disc Readings



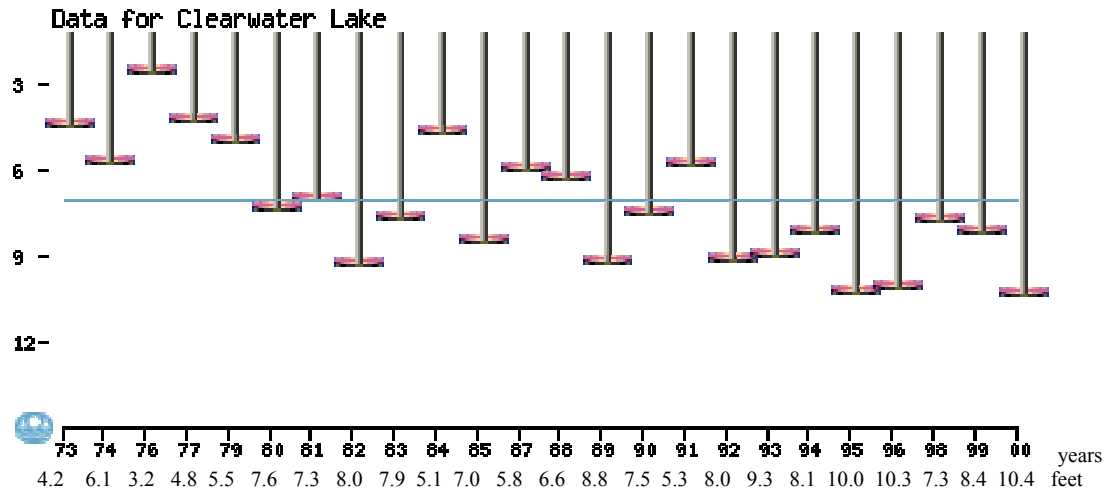
Graph 13. Transparency of North Browns Lake Based on Secchi Disc Readings



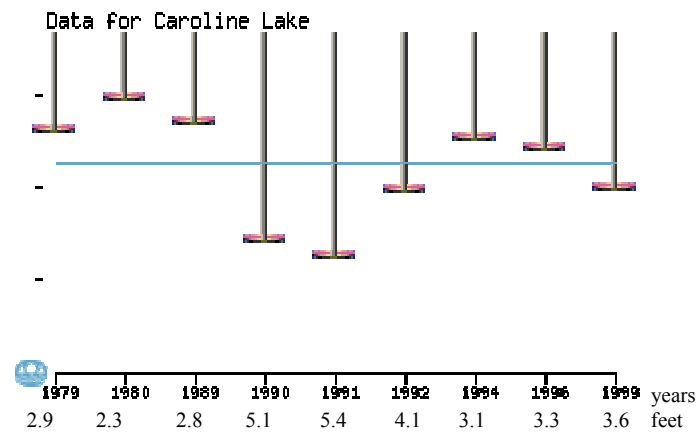
Graph 14. Transparency of Sylvia Lake Based on Secchi Disc Readings



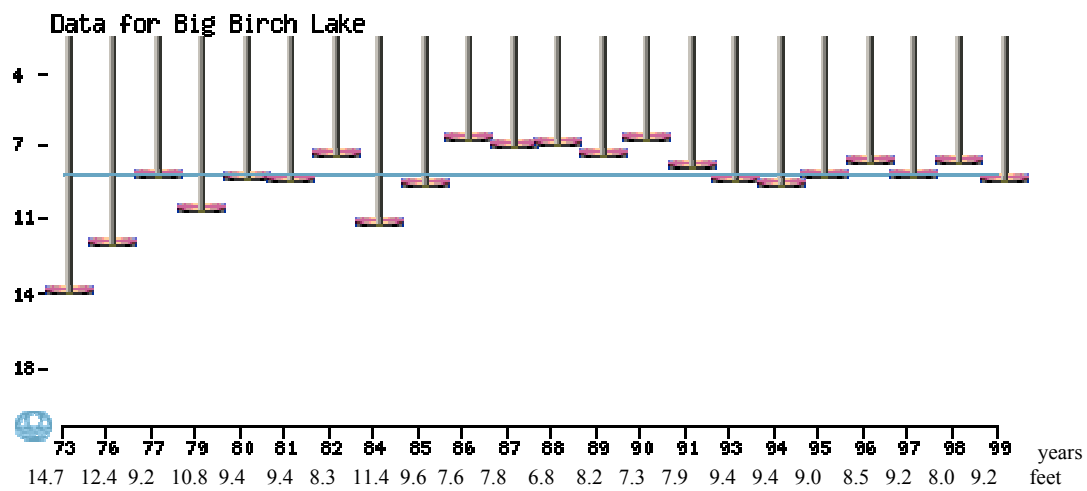
Graph 15. Transparency of Clearwater Lake Based on Secchi Disc Readings



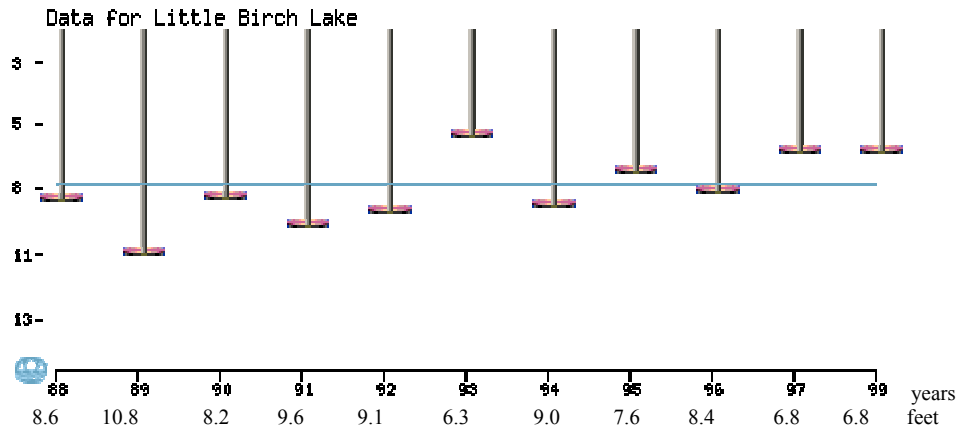
Graph 16. Transparency of Caroline Lake Based on Secchi Disc Readings



Graph 17. Transparency of Big Birch Lake Based on Secchi Disc Readings



Graph 18. Transparency of Little Birch Lake Based on Secchi Disc Readings



H. Summary of Clean Water Partnership Projects

Big Birch Lake

The Phase II work and Monitoring Plan was completed in December, 1995. The Big Birch Lake Phase I study determined that about 17% of the phosphorus budget is from direct atmospheric deposition. The watershed contributes approximately 73% of the total phosphorus to Big Birch Lake with 66% coming from the Fish Creek sub-watershed. The remaining 10% is estimated to be contributed from septic systems. The long-term goals focus on education and monitoring in both the Fish Creek sub-watershed and Big Birch Lake.

In Fish Creek the targeted average annual mean total phosphorus concentration is 150 µg/L or less, targeted average ortho phosphorus concentration is 30 µg/L or less, and the targeted average total suspended solids concentration is 7000 µg/L. In Big Birch Lake, the goal is an average summer total phosphorus concentration of 20-25 µg/L, average summer Secchi transparency greater than 2 meters, chlorophyll-a of 10 µg/L, and achieving 90% compliance with county ordinance septic tank rules by the year 2005.

To achieve these goals, it will be necessary to reduce phosphorus loading to the lake by about 50%. The goal is to accomplish this by decreasing feedlot and agricultural runoff, upgrading septic systems, and incorporating Best Management Practices in the Fish Creek Watershed and near shore areas of Big Birch Lake.

Horseshoe Chain of Lakes

The implementation and project work plan were submitted July 1997 to the MPCA. According to the MPCA Limnological Study and the Diagnostic Feasibility Study conducted by WRM, the Sauk River contributes the largest percentage of total and ortho phosphorus into the Horseshoe Chain of Lakes.

The long-term goals focus on education and monitoring in the lakes. The long-term goal is a flow-weighted average total phosphorus concentration in the Sauk River of 100-125 µg/L, in-flow average total suspended solids concentration of 9,000 µg/L, average summer total phosphorus concentration of 50-95 µg/L for non-flowage lakes and 90 µg/L for flowage lakes, average summer Secchi transparency greater than 2 meters, chlorophyll-a of 20 µg/L, and achievement of 90% compliance with county ordinance septic tank rules by year 2005.

To achieve the in-lake goal of less than 125 µg/L (flowage) and 90 µg/L (non-flowage) whole-lake average total phosphorus concentration, it will be necessary to reduce phosphorus loading to the lake by about 50% which in turn translates into annual flow-weighted mean total phosphorous concentration in the inflow streams of about 100-125 µg/L. To achieve this goal, it will be necessary to decrease feedlot and agriculture runoff, upgrade septic systems and incorporate Best Management Practices.

The Sauk River Watershed District and the Stearns County SWCD have focused efforts on the priority feedlots upstream of the Horseshoe Chain as the first management efforts. As part of the Sauk River Watershed District's five year plan, specific nonpoint source implementation actions have been initiated at six areas around the Sauk River Watershed and include: Lake Osakis, Big Birch Lake, Getchell Creek, Stoney Creek, Unnamed Creek and Eden Creek. The nonpoint source actions follow a lengthy and costly series of point source improvements that have been accomplished by the Cities of Melrose, Osakis, and Richmond.

The Sauk River Watershed District and the Stearns County SWCD have formally adopted a long-term goal of 25% nonpoint source total phosphorus reduction in the Sauk River, as measured at the Richmond monitoring site as a primary 5 year water quality goal for the Sauk River basin.

Big Fish Lake

The diagnostic study for Big Fish Lake is currently in progress.

Big Watab Lake

Big Watab has been aggressively upgrading septic systems. The Big Watab Lake Association has conducted phosphorus readings taken at two inlets to the lake and within the main body of the lake. Braun and Serco labs analyzed for total phosphorus concentration and are as follows:

1998	NE Inlet	620 ppb	150 ppb	240 ppb
1998	NW Inlet	30 ppb	10 ppb	
1999	NE Inlet	180 ppb	<10 ppb (Main Lake)	
1994	TP - 11	ppb		
1993	<10 ppb			

Note: In 1994, the Total Phosphorus of 11 ppb was the average.

In 1997, Secchi disk readings were high and the Lake Association attributed it to the northeast inlet not flowing.

Pearl Lake

The following information was compiled from discussions with the Pearl Lake Association. The Pearl Lake Association surveyed all lake property owners concerning their septic systems. Questions within the survey inquired about the frequency of pumpings and maintenance of septic systems. The Pearl Lake Aquatic Vegetation Survey was completed on July 16, 1996. The Pearl Lake Vegetation Management Plan was prepared by the Department of Natural Resources and approved by the Pearl Lake Association membership in 1997. The plan included provisions to protect hardstem bulrush, waterlilies, largeleaf pondweed, and clasplingleaf pondweed. The document also contains plans to control curlyleaf pondweed, Eurasian watermilfoil, and purple loosestrife.

I. Citizen Stream Monitoring Program

In 1999, three streams were monitored by volunteers in Stearns County (Figure 4) and included the Watab River, Zinniel Creek, and Kinzer Creek (Table 5). The Minnesota Pollution Control Agency developed this program and was implemented state-wide in 1998. Goals of this program are to collect valuable water quality data by expanding state-wide stream monitoring networks, to provide a basic program for anyone interested in stream monitoring, to complement existing citizen efforts, and to facilitate awareness of water quality issues and to promote shared goals.

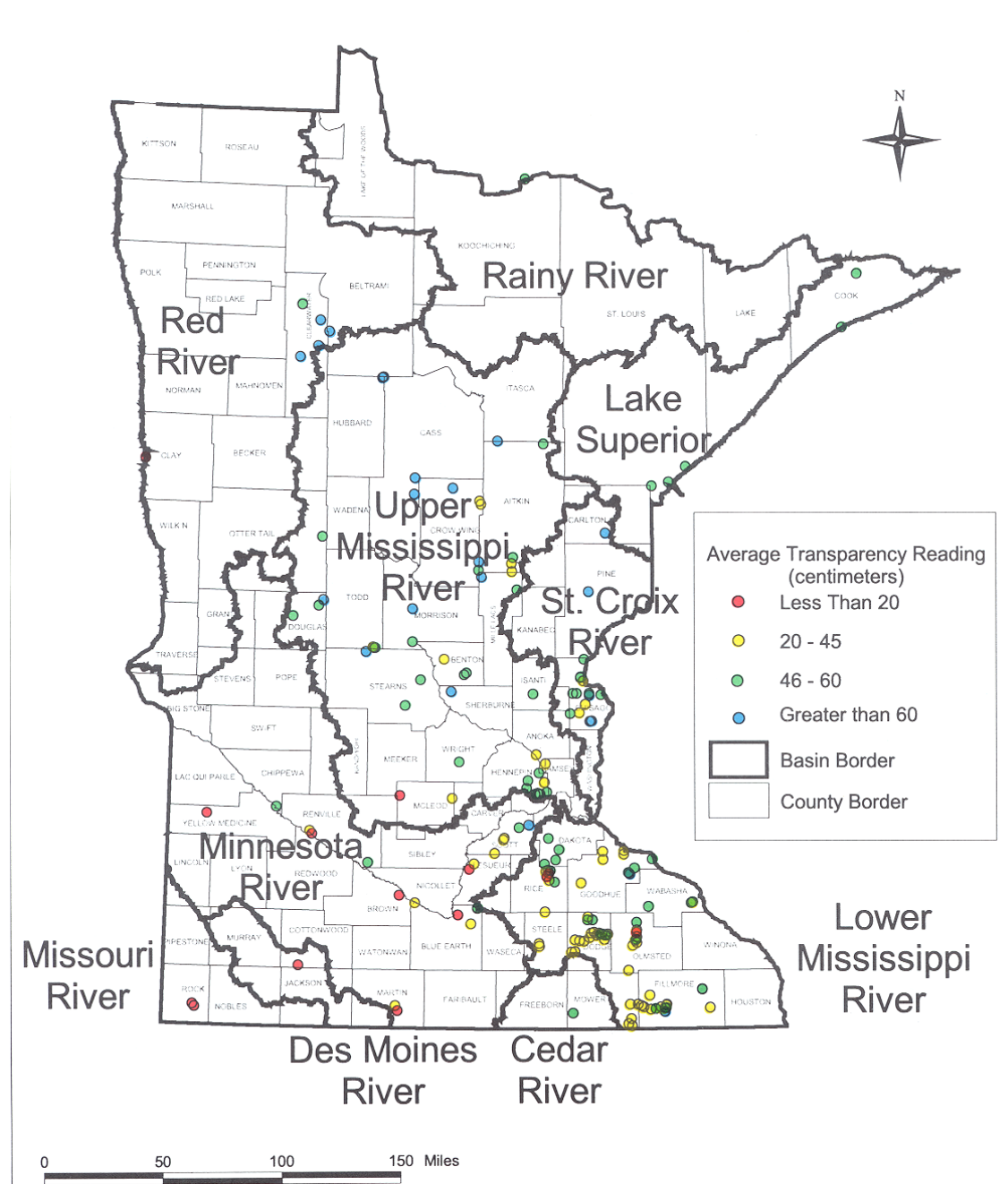
Table 5. Summary of 1999 Stream Data Collected by Volunteers

Waterway:	Mean:	Min:	Max:	N:	N>60:	Total Rainfall:	Rain Event:
Kinzer Creek	53	18	60	21	12	20.18	5
Watab River	56	40	60	29	22	20.76	9
Zinniel Creek	60	60	60	12	12	13.45	1

Note: Mean = mean stream transparency in centimeters.
 Min = minimum transparency reading in centimeters.
 Max = maximum transparency reading in centimeters.
 N = number of transparency readings taken.
 N>60 = number of transparency readings greater than 60 centimeters.
 Total Rainfall = amount of rain reported in inches.
 Rain Event = number of readings taken during rain events.

There is a one-time fee of \$20.00 to enroll into the program, which covers the cost of all equipment. Volunteers receive a transparency tube, rain gauge, data sheets, and instructions for taking measurements. Transparency measurements are taken once per week at a designated point within a stream. Precipitation is noted on a daily basis. Stream stage, visual appearance, and recreational suitability are recorded weekly. The Department and SWCD are actively promoting this program

Figure 4. Citizen Stream Monitoring in Minnesota



4. INVENTORY AND MAPPING

Mapping Efforts

The Minnesota County Biological Survey inventoried and mapped Stearns County regarding rare biological features. The map was developed in 1999 and the goal of a biological survey is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, rare animals, and native plant communities. This survey is utilized by Department Staff during the environmental review process and will become quite useful in the future when considering potential impacts to ecologically sensitive flora and fauna.

In 1999, the County received digital maps of the geologic atlas that was developed. This information is used by staff during the environmental review process and also provides valuable information to local natural resource managers regarding groundwater-related issues. The Department also has hard copies of the geologic atlas and are given to the general public free of charge.

5. LAND AND WATER TREATMENT

The major focus of the Water Plan is implementation of projects on the landscape. The SWCD along with the Watershed Districts are the implementation arm of the Water Plan and during 1999 and 2000, a number of conservation structures and practices were implemented by the SWCD (Table 6). The SWCD and Watershed Districts will continue to be important partners to ensure that environmental projects, Best Management Practices, and conservation structures are implemented to sustain the various ecosystems of the County.

Table 6. Conservation Structures and Practices Implemented by the Stearns County SWCD During 1999 and 2000

Item:	1999:	2000:
Earthen Manure Basin	9	17
Other Manure Structures	3	0
Water and Sediment Basins	4	1
Grassed Waterways	3	2

Note: This table represents a small portion of the projects completed during 1999 and 2000 by the SWCD. This does not include Watershed District projects or other initiatives implemented by other local, state, or federal agencies. For more information, please contact the Stearns County SWCD.

Buffer Program

In 1998, a buffer program was developed and implemented in 1999 and 2000 by the Department and SWCD. The County allocated \$25,000.00 towards this project to be used as incentive payments for landowners to enroll lands adjacent to wetlands, protected waters, and native prairie into this buffer program. This buffer program was initiated in conjunction with Pheasants Forever Conservation Reserve Program buffer bonus payments under the Conservation Reserve Program continuous sign-up. One major goal of the Water Plan is to improve Water Quality, while the major goal of Pheasants Forever is to increase wildlife habitat. The combination of these funds resulted in improved water quality and wildlife habitat.

Fifteen-year easements were purchased and lands adjacent to surface waters such as protected waters, protected wetlands greater than 10 acres in size, ditches, creeks, and ponds were eligible for enrollment. Thirty-five acres of land adjacent to wetlands were enrolled in 1999, while just over twelve acres of land adjacent to protected waters and native prairie were enrolled in 1999 for \$4,485.00 in incentive payments (Table 7). Forty-seven acres of land adjacent to wetlands were enrolled in 2000, while just over fifty-seven acres of land adjacent to protected waters and native prairie were enrolled in 2000 for \$18,195.00 in incentive payments.

Table 7. Acres Enrolled into the 1999 and 2000 Buffer Program

Year	Habitat Buffered	Acres Buffered	Square Feet of Buffer	Linear Feet of Buffer	Miles of Buffer
1999	Wetland	35	1,524,600	30,492	5.78
1999	Protected Waters and Native Prairie	12	522,720	10,454	1.98
2000	Wetland	47	2,047,320	40,946	7.76
2000	Protected Waters and Native Prairie	57	2,482,920	49,658	9.41

Note: Linear feet of buffer was calculated assuming that a buffer is 50 feet wide. For example, 1,524,600 divided by 50 = 30,492 linear feet, which was then divided by 5,280 to obtain miles of buffer.

6. REGULATION, ORDINANCES, AND PLANNING

A. Ordinances

The St. Cloud Environmentally Sensitive Areas Ordinance was officially adopted on August 24, 1998. The intent of this ordinance is to provide and encourage measures of protection to those properties identified as Environmentally Sensitive Areas and to provide for equitable economic return in consideration of protection and preservation of Environmentally Sensitive Areas.

B. Planning

Wellhead protection has become an important planning activity for public water suppliers in response to requirements of the Safe Drinking Water Act and the Minnesota Groundwater Act since adoption of the Wellhead Protection Rule. Currently, a number of communities in Stearns County have developed or are in the process of developing Wellhead Protection Plans. The following public water suppliers have completed delineations of their Wellhead Protection Area: City of Melrose (Figure 5) and the City of Cold Spring (Figure 6); the Gold'n Plump facility, Gluek Brewery, Town's Edge Mobile Home Park, Cold Spring Granite Company, and Alano Soc. are included within the City of Cold Spring.

Figure 5. City of Melrose Wellhead Protection Area

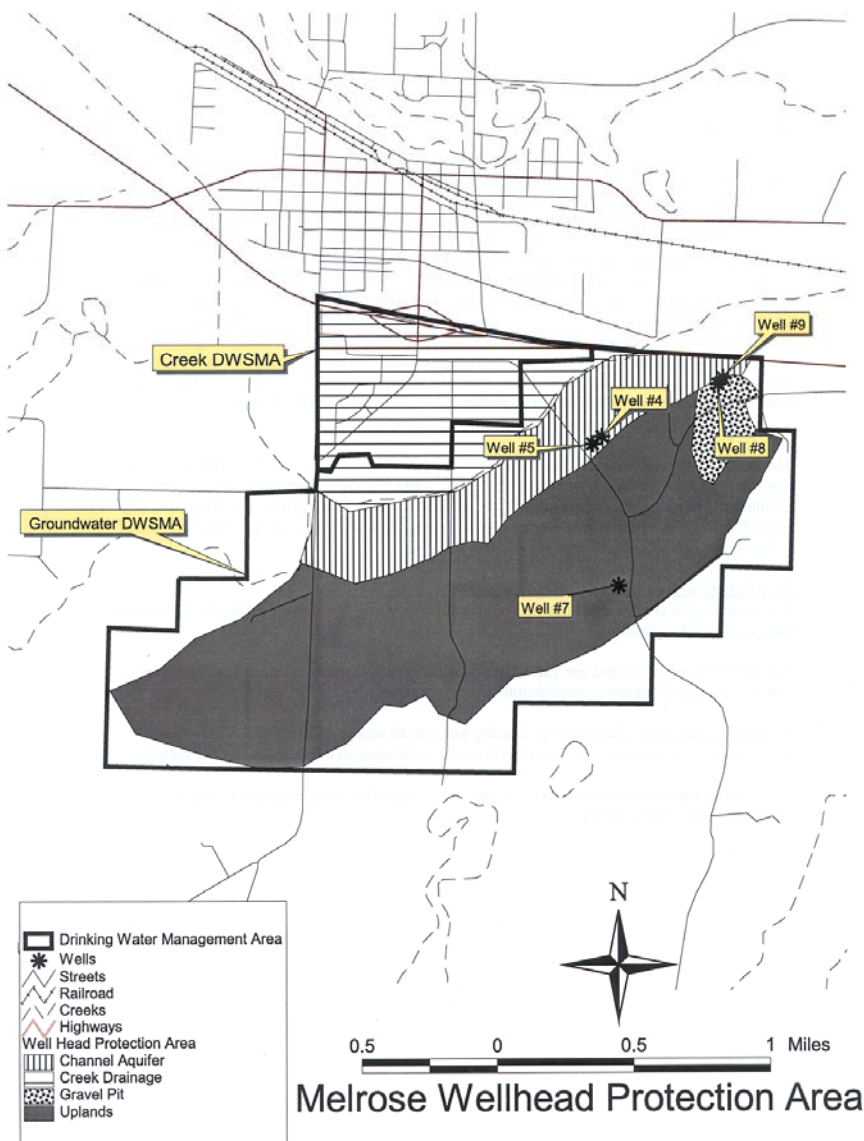
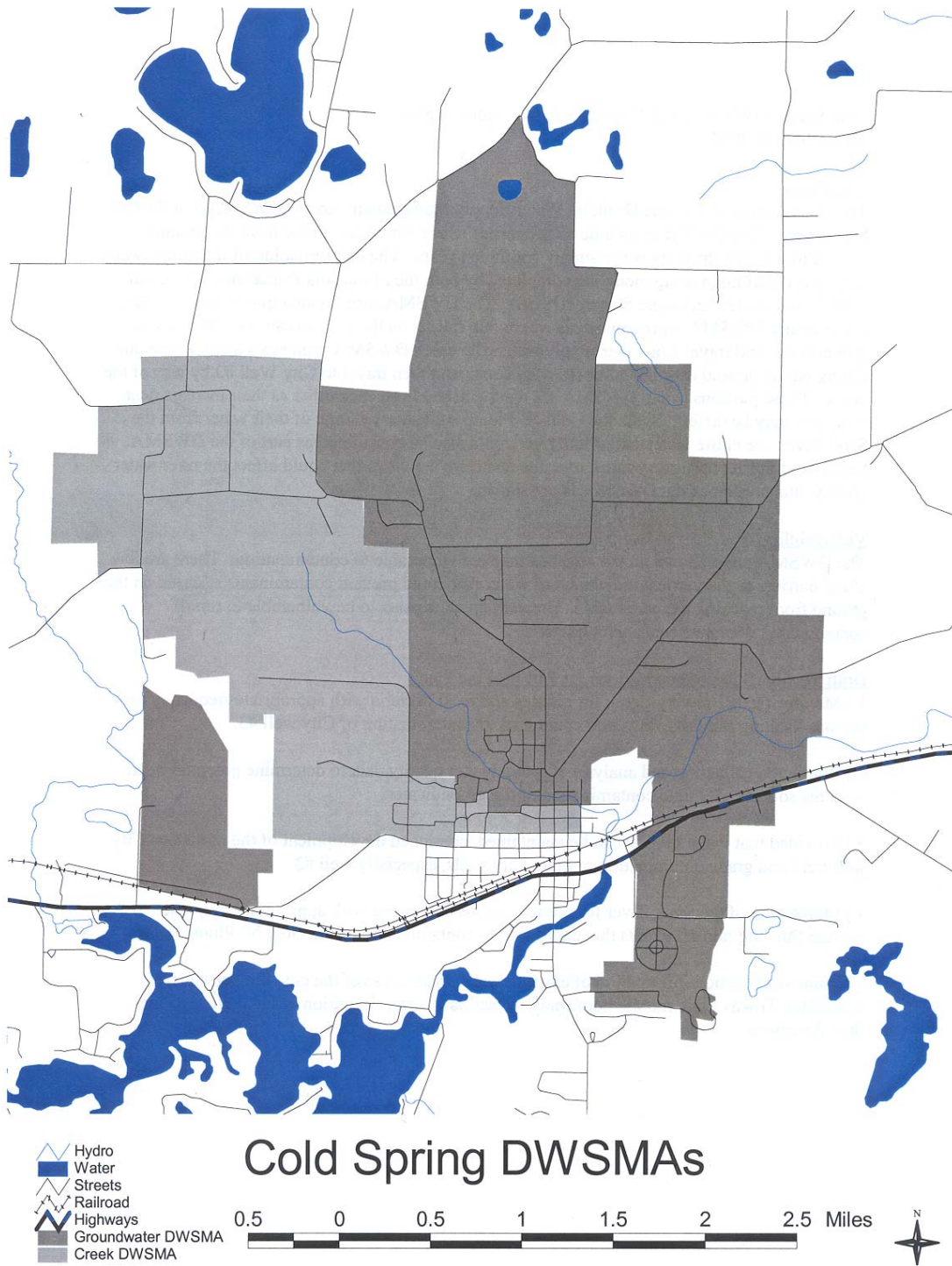
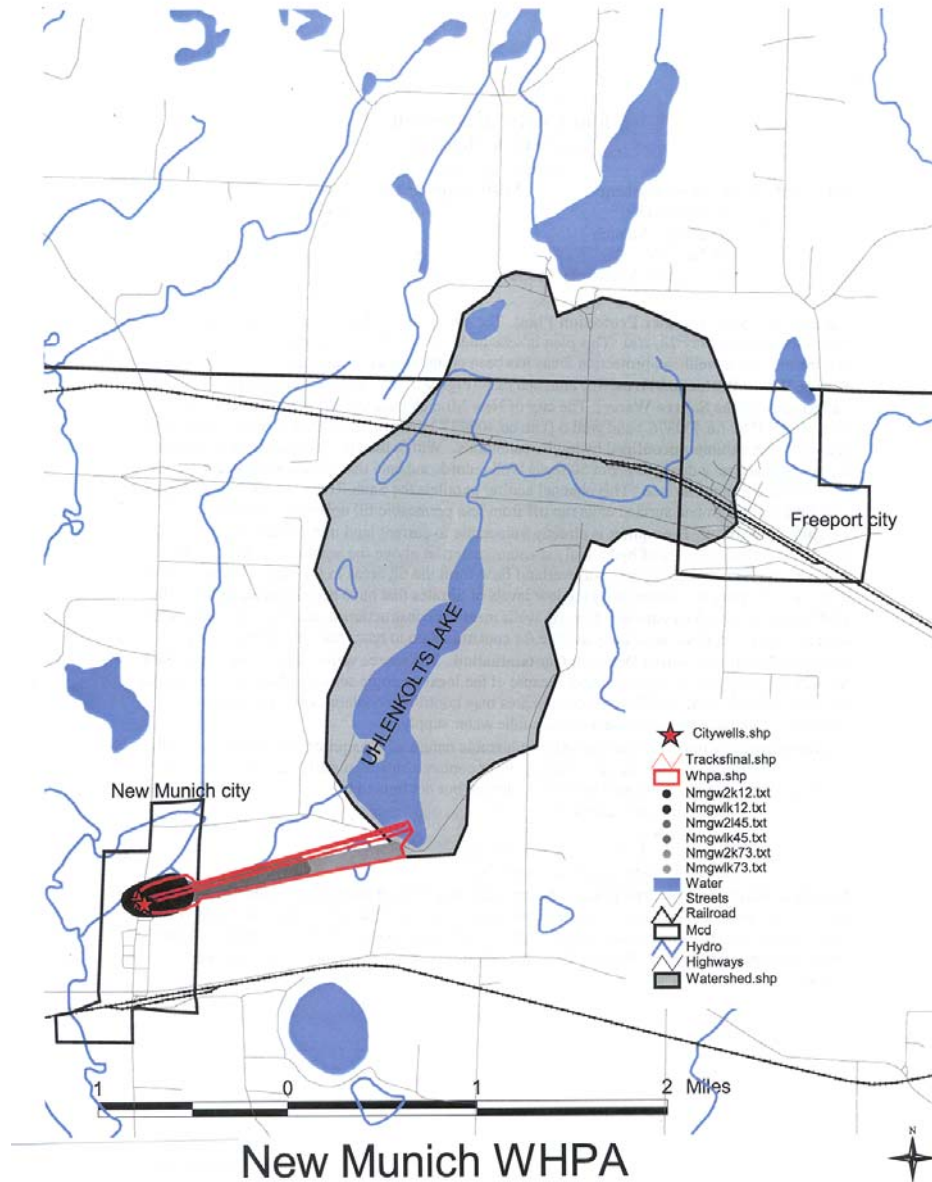


Figure 6. City of Cold Spring Drinking Water Supply and Management Area



The following public water suppliers are in the process of delineating Wellhead Protection Areas: Rockville, Richmond, Waite Park, New Munich (Figure 7), Meier Grove Senior Living Center, and Sauk Centre. Wellhead Protection processes that are inactive at the present time that will be re-initiated include Albany, Paynesville, and Eden Valley.

Figure 7. City of New Munich Wellhead Protection Area



Vulnerability to potential contamination sources relates to the priority for bringing communities into the Wellhead Protection Program. The lower the phasing number, the sooner the community will be brought into the Wellhead Protection Program by the Department of Health. Public water suppliers with Tier 1 Vulnerability (first priority) to be brought into wellhead protection planning within 24 months include:

The < 100 Phasing List includes: Sartell, St. Joseph, St. John's University, College of St. Benedict, Avon, Bel Clare Estates, Kimball, and Holdingford.

The 100 to 500 Phasing List includes: St. Martin, Roscoe, Sadlowsky's Mobile Home Park, Big Sauk Lake Mobile Home Park, Pine View Addition, St. Wendelin School, St. Stephen School, Tamarack Court, Inc., Walden Woods, Shady Oaks Mobile Home Park, Holy Cross School, St. Mary Help of Christians, St. John's Catholic School and Church, Clearwater Harbor Property, Inc., Riverview North Apartments, and St. Andrew's Catholic School and Church.

Public water suppliers for which MDH source water assessment and source water protection planning will occur includes the City of St. Cloud. Public water suppliers for which wellhead protection planning is complete and approved includes Viking Industries (Viking Waterbeds) Inc., St. Joseph.

Wellhead protection issues or potential sources of contamination that form the basis for development of a wellhead protection plan include the following:

Underground Storage Tanks	Above Ground Storage Tanks
Agricultural Chemical Tanks	Unused-Unsealed Wells
Hazardous Waste Generators	Dumps and Landfills
Spill and Leak Sites	Urban Stormwater
Urban Turf (Lawn)	Feedlots (Manure Storage/Application Sites)
Agricultural Cropland	Irrigated Cropland
Industrial Sites	Pipelines and Rail Crossings
Septic Tanks/Class V Injection Wells	Other Land Uses

C. Wetland Management Issues

Wetlands continue to be an issue regarding natural resources management and are one focus of the Stearns County Water Plan. During the fall of 2000, the Department along with the SWCD provided input into state policy regarding the wildlife exemption within the Wetland Conservation Act. This proved to be an excellent opportunity to discuss wetland management with state agency personnel. The following information describes and highlights important research, data, and information gathered and disseminated over the last several years.

Minnesota Wetlands Conservation Plan

The Minnesota Wetlands Conservation Plan (MWCP) was developed and published in 1997 to address the following issues:

- A. To recognize and apply regional differences in wetland policies and decision making.
- B. To simplify the permitting system and make it more accessible, responsive, and efficient.
- C. To develop and deliver better information to people making decisions about wetlands.
- D. To give resource agencies a common set of statewide strategies for conservation of wetlands.

Goal for Wetland Conservation

The goal for the wetland conservation in Minnesota is to maintain and restore the quality and diversity and increase the overall quantity of wetlands in the state, varying regionally in accordance with differences in the character and health of the wetland resource, in order to promote ecologically, socially, and economically sustainable communities.

Purpose of the MWCP

The purpose of the MWCP is to guide stewardship of wetlands and it does so by using a geographic system approach to the issues.

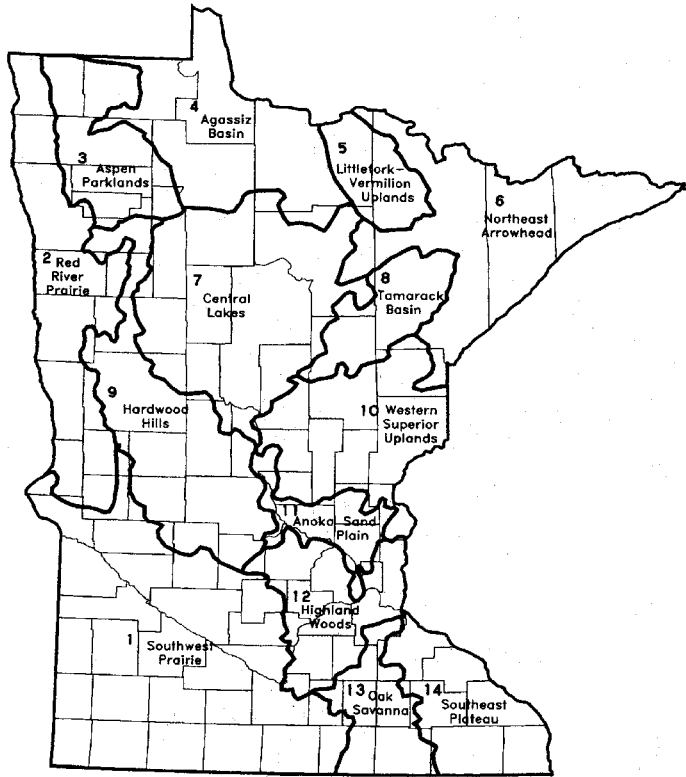
Wetland Facts

- A. Minnesota has more wetland acreage than any other state except Alaska.
- B. There are 10.6 million acres of wetland in Minnesota.
- C. Stearns County has between 50 and 80 percent of pre-settlement wetland acres left.
- D. There are currently 32,000 acres of wetland in the county (21.9 %).

Wetland Ecological Units

Stearns County is located within both the Anoka Sand Plains and Hardwood Hills Wetland Ecological Units (WEU). Local water plans, wetland plans, and land use plans remain the best way to account for specific local needs and conditions regarding wetland management within WEUs (Figure 8).

Figure 8. Wetland Ecological Units in Minnesota With County Boundaries



Research Priorities

The MCWP resulted in a number of research priority areas, which include sustainability; functional assessment; restoration, creation, and compensatory replacement; benefits and costs; and inventory issues. The Department has a copy of the MCWP, which can be reviewed upon request.

D. Wetland Evaluation Tools and Guidance

Minnesota Routine Assessment Method

The Minnesota Routine Assessment Method (MNRAM) for evaluating wetland functions was developed by the Minnesota Interagency Wetland Group in 1996 to be used as a field evaluation tool to assess wetland functions. MNRAM was revised in 1997 and incorporates more technical information regarding groundwater.

Wildlife Habitat Exemption Proposals

The Minnesota Interagency Wetland Group developed specific guidance for LGUs and SWCDs regarding the certification and approval of wildlife habitat projects being proposed in accordance with the Minnesota Wetland Conservation Act (Minnesota Rules, Chapter 8420). However, Stearns County and the SWCD are now requiring more data and information than the Minnesota Wetland Conservation Act to grant exemptions from this Rule so that ecologically sound decisions are made.

Anoka Sand Plains Guidance

This guidance document is a result of the MWCP and was developed in September 2000 to address wetland issues in the Anoka Sand Plains WEU. This document provides an ecological evaluation of the wetland ecosystems within this WEU. The Department has a copy of this document, which can be reviewed upon request. Chapters within this document include the following:

- A. Introduction
- B. Ecological Approach and Desired Outcomes
- C. Profile of Historic Conditions in the Anoka Sand Plain
- E. Wetlands in the Anoka Sand Plain
- F. Wetland Management Planning and Prioritization
- G. Wetland Inventory and Assessment
- H. Wetland Management Practices