

Section 3

Resource Initiative A: In-Lake Water Quality



A. Key Issues

- **Complex Ecosystem.** The Sauk River Chain of Lakes is a complex reservoir ecosystem of flowage and non-flowage lakes.
- **Poor Water Quality.** Lake water quality in the Sauk River Chain of Lakes has been impacted by human activities and land cover changes in the SRCL Lakeshed over the past one hundred years.
- **Economics of Good Water Quality.** A study completed by faculty from Bemidji State University for the Legislative Commission on Minnesota Resources found a strong correlation between the quality of water and the value of shoreland property in northern Minnesota. The study concluded that good water quality has a positive relationship with higher lakeshore property values.

B. Key Findings

- **Large Watershed, Shallow Lakes.** The watershed that drains into the Chain of Lakes is large. The ratio of the watershed (approximately 602,000 acres) to the surface area of the 14 lakes (2,456 acres) is 181:1, which is especially high in comparison to most other lakes in Minnesota. In general, the lakes are relatively shallow with numerous shallow bays.
- **Some Good Progress, More Needed.** Lake water quality has improved over the last fifteen years. Most of these improvements have come from upgrades to the wastewater treatment plants (point source), primarily the plant in Melrose completed in the early 1990s. The focus has now shifted to reducing impacts from non-point sources.
- **Partnerships.** The SRCL has established good working relationships with resource agencies working in the Sauk River Chain of Lakes area.

C. Primary Roles of the SRCL

- **Encourage and Promote.** Serve as *THE* advocate and liaison for the SRCL Sublakeshed to promote and encourage the wise management of land and water resources.
- **Support Projects and Programs.** Support efforts by resource agencies and landowners to protect and improve water resources in the SRCL Lakeshed.
- **Comment and Leverage.** Provide input on matters that affect the SRCL Lakeshed. Provide financial assistance and volunteer labor to make good things happen.

D. Goals, Objectives and Action Items

Goal 1: Improve Surface Water Quality. Improve surface water quality from current conditions to meet long-term goals established in the Horseshoe Chain of Lakes Diagnostic Study (SRWD – 1992) over the full range of flow conditions in flowage and non-flowage lakes and the Sauk River.

Rationale:

- For decades, families and friends have enjoyed hours of quality time living and recreating on and around the Sauk River Chain of Lakes.
- Water quality targets set in previous studies are reasonable and still have not been met.
- The governmental structures in the water resource management arena are very complex in Minnesota. Understanding which agency is responsible for what activities is important to successful lake associations and their ability to become more effective.
- Water quality is key to economic and social well being of the SRCL community.

Monitoring Indicators:

Short Term Goals

Sauk River and Tributaries.

- TSS: 16,000 ug/l.
- TP: < 150 ug/l.

Non Flowage Lakes.

- TP: < 90 ug/l.
- Chl a: 40 ug/l +/- 5.
- Secchi: 5 feet +/- 1.

Flowage Lakes.

- TP: < 125 ug/l.
- Chl a: 40 ug/l +/- 5.
- Secchi: 5 feet +/-.

Long Term Goals

Sauk River and Tributaries.

- TSS: 9,000 ug/l.
- TP: < 100-125 ug/l.

Non Flowage Lakes:

- TP: < 50-70 ug/l.
- Chl a: 20 ug/l +/- 5.
- Secchi: > 6 feet.

Flowage Lakes:

- TP: < 90 ug/l.
- Chl a: 20 ug/l +/- 5.
- Secchi: >6 feet.

Objective A: SRCL Training. Increase the awareness and understanding by SRCL leaders and members on applicable water resource management topics.

Actions:

1. Water Quality Training. Support attendance by SRCL members to at least two water quality training sessions each year.
2. Annual Conference. Support attendance to the annual statewide *Lakes and Rivers Conference* by SRCL members and local officials from the SRCL Sublakeshed. Consider paying for the registration fees for a certain number of people each year to encourage attendance.
3. Agency Roles and Responsibilities. Provide information to the SRCL Board, subcommittees, and interested SRCL members on the water resource agencies and what their statutory roles and responsibilities are. Invite agency personnel to give presentations at committee and board meetings, as appropriate, to help clarify the roles and processes of the various agencies.

Objective B: Analysis and Understanding. Increase the analysis and understanding of available water quality information and documentation by SRCL members with their partnering resource agencies.

Actions:

1. Review Documents. By March 2005, work with the SRCL Technical Committee and other appropriate resource managers to collect, review and understand data that has been collected and the diagnostic studies that have been prepared for the SRCL Lakeshed.
2. Contribution Areas. By May 2005, assess available information and assign contribution areas into 3 broad categories, in-lake, near-shore, and tributaries. Identify the minor watersheds for each contribution area and prepare a map that illustrates each contribution area and their minor watersheds. Integrate monitoring and data collection between the contribution areas and the minor watersheds.
3. Missing Information. By June 2005, in conjunction with the SRCL Technical Committee, identify and list water quality information that is currently not available or being collected.
4. Data Gaps. By August 2005, develop an activity plan to fill in identified data gaps.
5. SRCL Technical Committee Meetings. Establish effective partnerships with resource managers familiar with the area by scheduling meeting time to discuss specific issues.

Objective C: Data Collection and Management. Establish a long-term comprehensive information base for the SRCL Sublakeshed.

Actions:

1. Transparency Monitoring of Contribution Areas. Work with the SRCL Technical Committee to establish volunteer transparency monitoring for each contribution area by April 2006.

2. Transparency Monitoring of Tributaries. Work with the SRCL Technical Committee to provide voluntary transparency monitoring and optical brightener monitoring scanning on tributaries by April 2006.
3. Lake Levels. Work with the SRCL Technical Committee to provide lake level information on each basin by April 2006. (See In-Lake Water Quality Goal 2, Objective B.)
4. Staff Gauges. Work with the SRCL Technical Committee to establish staff gauges on each tributary by April 2006.
5. Rain Gauge Monitoring. By February 2005, identify 3-4 rain gauge monitors to participate with Stearns SWCD and the SRWD in volunteer precipitation monitoring. (See In-Lake Water Quality Goal 2, Objective B.)
6. Training for Data Collection Volunteers. By February 2006, facilitate training for 6-10 volunteers to assist the SRWD with surface water chemistry collection and dissolved oxygen and temperature profiles on all contribution areas.
7. Annual Data Management Meeting. Support and participate in the annual data management meetings for water resource agencies in Stearns County (initially organized by the Stearns County SWCD). Encourage the effective and meaningful collection, use, and analysis of data. Work with staff from the SRWD, Stearns SWCD, Stearns ESD, MPCA, MN DNR and other resource agencies to organize and analyze data collected for the SRCL Lakeshed.

Objective D: Education for SRCL Lakeshed Residents. Support efforts by resource agencies to share information on water quality topics with SRCL Lakeshed residents. Provide educational opportunities to SRCL members, other lakeshore owners, schools and community groups in the SRCL Lakeshed.

Actions:

1. Water Festivals. Provide volunteer assistance to local water festivals and water quality demonstration projects.
2. Demonstration Projects. Assist with distribution and publication of water quality demonstration projects or educational opportunities provided by resource managers.
3. Links on the Chain. Develop the "Links on the Chain" education program to highlight actual demonstration programs, "how-to's", etc. Provide an annual "Links on the Chain" event for residents to travel by boat or car to learn and socialize.
4. Treasure Chest. Arrange for SRWD Treasure Chest presentations in our area schools. Continue to sponsor the Treasure Chest program of the SRWD.
5. Water Quality Library. Work with the SRWD and the Stearns County Coalition of Lake Associations (COLA) to develop a library of media presentations dealing with water quality issues and make presentations available for checkout and/or download.
6. Scholarships. Establish scholarships for students who develop and present projects on issues related to water quality.
7. Newsletter. Distribute relevant watershed information through the SRCL newsletter.
8. Website. Provide links on the SRCL website to available resources regarding water quality topics.

Objective E: Landowners and Projects. Facilitate the connection between landowners with the programs that can help improve water quality and the resource agency staff who administer the programs. (Coordinate this objective with the Land Resource Initiatives found in Section 5 of this Plan.)

Actions:

1. Interested Landowners Lists. Develop and maintain a list of SRCL members willing to install shoreland conservation practices that benefit water quality by April 2005. Develop a list of SRCL members that have relationships with landowners or officials within the SRCL Lakeshed who would be willing to promote water quality protection projects.
2. Incentives. Provide additional financial and technical incentives, where needed, to induce SRCL Lakeshed landowners to install conservation practices in critical areas.

Goal 2: Manage Lake Levels. Manage surface water quantity to reduce swings in lake water levels to the extent possible given the physical characteristics and limitations of the SRCL Lakeshed. Manage peoples' behaviors and expectations regarding lake level fluctuations.

Rationale:

- The Sauk River Chain of Lakes is a reservoir system. Lakes levels are affected by the amount of precipitation, evaporation rates and other weather factors, and the condition of the landscape. Natural landscapes are more effective at storing surface water than man-made landscapes.
- We have dramatically increased the amount of surface water runoff over the last 100 years by draining wetlands, ditching and tiling, installing culverts, changing land cover, and a host of other land development activities.
- Landowners in the SRCL Sublakeshed have expressed concerns about fluctuating lake levels and effects on their properties.

Monitoring Indicators:

- Completion of a landowner survey regarding lake level problems.
- A reduction in the number of floodplain violations and flood damage costs.
- A reduction in the number of complaints regarding lake level fluctuations.

Objective A: SRCL Training on Lake Level Control. Learn about variables and possible ways to control lake water levels, as well as ways to help landowners understand and live/work with fluctuating lake levels.

Actions:

1. MN DNR/USGS Monitoring. Representatives of SRCL meet with the MN DNR Division of Waters and USGS staff to review the existing water level monitoring efforts and data recorded for lake levels.
2. Shoreland Landowner Survey. Survey landowners in the SRCL Sublakeshed and record specific lake level issues they have. Document information for all parcels using the parcel identification number as a reference.
3. Historic Lake Levels. Compile, analyze and graphically illustrate lake levels.
4. Floodplain Management. Meet with the MN DNR area hydrologist, floodplain management staff, and local land use officials to discuss floodplain management. Review the usefulness and quality of the existing floodplain mapping. Review the availability and ease of use of the data by landowners in the SRCL Sublakeshed who may be affected by floodplain issues. Review the results from the landowner survey.

Objective B: Lake Level and Precipitation Monitoring. Support efforts to monitor lake levels and precipitation. Coordinate these efforts with the MN DNR, Stearns County SWCD and the SRWD. (For more information on lake levels, please see the MN DNR website. For more information on the precipitation monitoring data, please contact the Stearns County SWCD.)

Actions:

1. Monitoring Methods. Work with the MN DNR Area Hydrologist and the SRWD to establish the appropriate methods for accurately measuring lake levels including monitoring location, equipment needed, frequency, procedures, and collection forms.
2. SRCL Lake Level Monitoring Coordinator. Assign one person to assist the MN DNR Area Hydrologist and the SRWD in coordinating volunteer activities, data collection, and the storing and reporting data.
3. Volunteers. Recruit volunteers to take lake level readings.
4. Data Analysis and Reporting. Participate with the appropriate agencies in the periodic analysis of data collected in the lake level monitoring program. Report the results of this monitoring to the Water Quality Subcommittee, the Fisheries/Aquatic Vegetation Subcommittee, the Land Use Subcommittee, lake leaders, the SRCL Board, and the membership.
5. Precipitation Monitoring. Support efforts by the Stearns County SWCD and the SRWD to monitor precipitation in the SRCL Sublakeshed.

Objective C: Lake Level Management. Support efforts by resource agencies to properly manage lake water levels in the Sauk River Chain of Lakes.

Actions:

1. Dam Operations. Meet with local and state officials that operate dams on the Sauk River (Sauk Centre, Melrose, Cold Spring, etc.) and other control structures to: 1) review the operation plans with agency staff, 2) learn what capabilities exist and how the facilities are managed, 3) learn what parameters are used to determine when water is released, 4) what the affects are on the SRCL Sublakeshed, and 5) what the SRCL and partnering agencies can do to affect such actions.
2. Newsletter. Communicate the results of the SRCL and agency efforts to manage lake levels on an ongoing basis.
3. Website. Create a link on the SRCL website that links to the MN DNR Division of Waters website regarding lake levels. Encourage landowners to refer to this website.
4. Floodplain Maps. Support efforts to improve the accuracy, legibility and usefulness of floodplain maps for the SRCL Sublakeshed.

Goal 3: Protect groundwater quality and quantity. Protect groundwater quality and quantity in the SRCL Lakeshed.

Rationale:

- There are approximately 1,500 dwellings located around the Sauk River Chain of Lakes that obtain drinking water from private wells.
- The Minnesota Pollution Control Agency (MPCA) has classified this area as having “*Very High*” sensitivity to groundwater pollution.
- The Minnesota Department of Health (MDH) has developed nitrate probability maps that assess the potential for nitrate contamination. The SRCL Sublakeshed has significant areas with high-risk designations. Nitrate contamination is often regarded as a first sign of deteriorating groundwater quality.
- Nitrates can enter drinking water supplies from sources such as septic systems and agricultural and urban stormwater runoff.

Monitoring Indicators:

- ___ number of wells tested for nitrates.
- ___ number of wells with nitrate levels above 10 mg/l.

Objective A: SRCL Training. Educate the SRCL about factors affecting groundwater quality and quantity.

Actions:

1. Collect Documentation. Contact appropriate resource agencies to identify groundwater resource documents available, both persons and written materials. Gather and organize the materials on an ongoing basis.
2. Study Materials. Study the materials and work with the SRCL Technical Committee to review and discuss the relevant metrics to properly monitor groundwater quality and quantity.
3. Groundwater Recharge Areas. Work with resource agencies to identify and map groundwater recharge areas such as wetlands in the SRCL Sublakeshed. (See Section 5: Land Use for goals, objectives, and action items relating to wetlands.)
4. Septic Systems and Groundwater. Distribute information to landowners in the SRCL Sublakeshed that describes the potential impacts that septic systems can create in groundwater.

Objective B: Support Groundwater Monitoring. Support efforts by the Stearns SWCD, SRWD, MN DNR, MPCA, MDH, and Minnesota Department of Agriculture (MDA) to monitor groundwater quantity (levels) and quality in the SRCL Sublakeshed.

Actions:

1. Observation Well Monitoring Methods. Work with the MN DNR Area Hydrologist, Stearns SWCD and other agency personnel to establish the appropriate methods for accurately measure groundwater levels including

- monitoring location, equipment needed, frequency, procedures, and collection forms.
2. SRCL Observation Well Monitoring Coordinator. Assign one person to assist the MN DNR Area Hydrologist in coordinating volunteer activities, data collection, and the storing and reporting data.
 3. Volunteers. Recruit volunteers to take observation well level readings.
 4. Data Analysis and Reporting. Participate with the appropriate agencies in the periodic analysis of data collected in the observation well monitoring program. Report the results of the observation well monitoring to the Water Quality Subcommittee, the SRCL Board and the membership.
 5. Groundwater Quality Monitoring. Support efforts by the MPCA, MDH, and MDA to monitor groundwater quality in the SRCL Sublakeshed. Recruit volunteers to assist resource agencies in monitoring activities such as coordinating access to monitoring sites or distributing information to the public.
 6. Groundwater Quality Analysis. Participate with the appropriate agencies in the periodic analysis of data collected in the groundwater quality monitoring programs. Report the results of the monitoring to the Water Quality Subcommittee, the SRCL Board and the membership.

Objective C: Landowner Program. Establish an appropriate program for residents of the SRCL Sublakeshed to monitor the quality of their drinking water supplied by private wells.

Actions:

1. Program Parameters. Determine what parameters should be monitored, recommended frequencies, procedures, costs, etc.
2. Clinics. Develop and conduct ongoing clinics for people to have well water tested and analyzed.
3. Database. Develop a database for managing test results to allow identification of problems, patterns and developing issues to be addressed.
4. Annual Meeting. Continue to support nitrate testing at the annual meeting.

Objective D: Support Community Wellhead Protection Efforts. Support wellhead protection planning and implementation efforts by local units of government in the SRCL Sublakeshed.

Actions:

1. WHP Plans. Support efforts by the cities of Cold Spring and Richmond on their work with the MDH to develop and implement their Wellhead Protection (WHP) Plans.
2. BMPs. Support the use of Best Management Practices (BMPs) relating to groundwater for all land uses and activities in the SRCL Lakeshed.

Objective E: Support Proper Abandonment of Private Wells. Support the proper abandonment of unused wells, first in high-risk areas in the SRCL Sublakeshed, then in other areas of the Sublakeshed.

Actions:

1. Landowner Survey. Work with county water plan programs to survey landowners in the SRCL Sublakeshed on the location of abandoned wells on their properties.
2. Public Relations. Periodically distribute information and/or place in newsletters information regarding the potential impacts of abandoned wells and the proper sealing of them. Direct all landowners with abandoned wells to the county water planning programs and resource agencies.
3. Financial Assistance. Consider providing financial assistance to landowners to leverage other program dollars, including the cost-share program administered by the SRWD, to properly seal abandoned wells in the SRCL Sublakeshed. Give priority to abandoned wells located in high-risk areas.