

Section 8

Recommendations to Agencies



A. Enhancing Working Relationships

Maintain the SRCL Technical Committee

The first recommendation to resource agencies is to maintain the SRCL Technical Committee. In this planning process, this group of agency personnel provided excellent insights into the challenges and opportunities of managing the Sauk River Chain of Lakes and the SRCL Lakeshed.

To be successful in the implementation of this Plan, maintaining the SRCL Technical Committee will be essential. Therefore, the SRCL desires that all members of the Technical Committee formally request their home agencies agree to their continued and active involvement in the implementation of the SRCL Lakeshed Management Plan and make the appropriate administrative arrangements to ensure their participation on an ongoing basis.

The SRCL recognizes that resource agencies, after several years of budget cuts, are operating on tight schedules and budgets. To offset this, the SRCL proposes to efficiently request agency staff time in the implementation of this Plan. Periodic meetings between the SRCL and the Technical Committee will be planned out over a one-year timeframe time prior to the end of each year. The meeting schedule will be based on the anticipated work proposed by the SRCL and the resource agencies in the upcoming year.

A planned meeting schedule proved to be effective for the SRCL's lakeshed management planning process. The SRCL believes that this approach will help in coordinating meetings and corresponding workloads while minimizing time required by agency staff.

Annual Implementation Review Meetings

One of the last steps in the SRCL lakeshed management planning process was to convene a **joint meeting** with local officials. Some of the organizations represented at the meeting included the SRWD Board of Managers, the Stearns County Board of Commissioners, the Stearns SWCD, Stearns County Water Plan Task Force, and officials representing townships and cities in the SRCL Sublakeshed.

The purpose of this joint meeting was to help build better awareness as to what the SRCL was proposing in their Plan and to gather feedback from the groups represented. The meeting was also convened to discuss ways to enhance coordination of the Plan's implementation and potential funding sources.

The opportunities to discuss and refine coordination, funding and other implementation activities should be the central focus of future joint meetings or annual summits. The SRCL believes that given the limited resources facing land and water resource management agencies and organizations, more formalized efforts to increase coordination will most benefit their lake community.

The SRCL recommends that at least one meeting be held with resource agencies each year to review and discuss implementation, coordination, and funding topics. The SRCL will work with the SRWD, Stearns SWCD and other organizations to organize and convene these meetings.

B. Minor Watershed Recommendations

"A lake is a reflection of its watershed." -- MPCA 1985 – Horseshoe Study

What occurs on the landscapes of a watershed greatly affects the quality of water in its lakes, rivers and streams. While in-lake conditions play a significant role in determining the ecology and biology of lakes, the quality of the water draining into lakes plays an equally critical role.

As many of the **point sources** causing water pollution in the Sauk River Watershed District have been addressed over the last twenty to thirty years such as the Melrose WWTP for example, resource agencies are now focusing on reducing **non-point sources**.

And while good progress has been made in the Sauk River major watershed in terms of monitored water quality, citizens from the Sauk River Chain of Lakes area still want to see more improvements in their lake water quality. Citizens at the June 29, 2002 SRCL visioning session made water quality their top priority.

Identifying non-point sources is difficult given its ubiquitous nature. Agencies and lake associations alike are struggling with developing comprehensive yet fast and cost effective ways to specifically identify, evaluate, and correct non-point pollution.

The SRCL lakeshed management planning process included a detailed inventory and assessment of non-point sources on a minor watershed level. The following narrative describes results from the Minor Watershed Assessment (MWA) developed for this Plan as well as a series of recommendations for resource agencies to consider in implementing a non-point pollution management strategy for the SRCL Sublakeshed.

Historic Land Cover Changes: The Starting Point

Land cover changes made incrementally over the past 100 years have made a profound impact on the quality of water in lakes and streams. A primary impact from land use is the increased contribution of phosphorus with surface water runoff. When attached to soil particles, phosphorus is carried into a lake or stream by water runoff from the land.

Phosphorus is a general soil nutrient that when in excess in a water feature, can cause severe algal blooms and oxygen depletion leading to degradation of water quality and

diminished aesthetic and recreational enjoyment. The greater the phosphorus content in runoff water, the more the water quality in the receiving water is threatened. Phosphorus is critical because it is usually the nutrient defining lake water quality in Minnesota.

Historic Phosphorus Export Analysis

The U.S. EPA and the MPCA use phosphorus runoff coefficients to estimate the changes in the quality of runoff likely to follow land use changes. Forested land covers, for example, are estimated to produce 0.14 pounds of phosphorus per acre per year. The figure for cultivated land is 0.89 pounds per acre per year and for shoreland residential type land covers is 1.12 pounds per acre per year. Based on these coefficients and land areas, it is possible to make a general estimation of the increased phosphorus transport that has occurred within the SRCL Sublakeshed. Table 8 summarizes the results:

Table 8
Historic Phosphorus Export Analysis – SRCL Sublakeshed

Land Use	Presettlement			1990		
	Acres	TP Export (lbs/ac/yr)	Phosphorus Contribution	Acres	TP Export (lbs/ac/yr)	Phosphorus Contribution
Urban Development	0	NA	0	1,142	1.12	1,279
Rural Development	0	NA	0	2,512	1.00	2,512
Cultivated Land	0	NA	0	50,514	0.89	44,957
Prairie/Grassland	32,573	0.36	11,726	11,410	0.36	4,107
Forestland	39,083	0.13	5,081	7,607	0.13	989
Water	2,955	0.00	0	5,247	0.00	0
Bog/Marsh/Wetland	5,073	0.04	203	1,252	0.04	50
Total	79,684		17,010	79,684		53,895

Key Findings from the Historic Land Cover and Phosphorus Export Analysis

- Increased Phosphorus Export. Since presettlement, the amount of phosphorus being transported into the Sauk Chain of Lakes has increased by over three times.
- Slow but Steady Degradation. Like the slow land use transformation of the landscapes in the SRCL Sublakeshed over the past 100 years, the water quality in the lakes and the Sauk River has declined. The long-term trend has been one of degrading or declining water quality.
- Cumulative Impacts. As shown above, all land cover types export phosphorus. All landowners and land uses contribute to phosphorus export and other non-point problems.

Where is the phosphorus coming from?

The following is a generalized list of common sources of phosphorus found in stormwater runoff and surface water features such as streams, rivers and lakes:

Point Sources

- Municipal and industrial wastewater treatment plant discharges.
- Stormwater discharge pipes.

Non Point Sources

- Runoff from cropland and feedlots.
- Sewage from septic systems and leaking sewer pipes.
- Runoff from shoreland and urban development.
- Lawn clippings, excess lawn fertilizer, and other activities.
- Eroded soils carrying phosphorus particles.
- Atmospheric deposits.

Results from the Minor Watershed Assessment

While the above list is helpful, it still does not specifically identify where the phosphorus is coming from in the SRCL Sublakeshed or in each of the 20 minor watersheds.

The purpose of the Minor Watershed Assessment is to provide the SRCL and resource agencies with a detailed analysis of conditions and land/water relationships so that targeted strategies can be developed and prioritized in order to more effectively address key water resource issues.

Each of the 20 minor watersheds in the SRCL Sublakeshed is distinct in character, they vary greatly in terms of natural conditions such as size, shape, slope, soils, and drainage patterns. For example, the largest minor is Luxemburg Minor Watershed (MWS No. 19 or MN DNR 1600600) at 12,513 acres. The smallest is Zumwalde Minor Watershed (MWS No. 8 or MN DNR 1601603) at 257 acres.

The 20 SRCL minor watersheds also vary greatly from a land use perspective or cultural factors. For example, Luxemburg Minor Watershed has over 6,700 animal units while two of the minors have none.

Minor Watershed Management Priorities and Generalized Strategies

The left hand column on the list below provides a brief summary of the three primary management concerns for each minor watershed in the SRCL Sublakeshed as analyzed through the Minor Watershed Assessment (MWA) process. The right hand column in the list provides generalized strategies to address these targeted concerns.

MWS 1 – Sauk River Minor Watershed (1700)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Stream density – high.	Riparian buffers.
2.	Animal units – high.	Feedlot runoff control.
3.	Cultivated land – high.	Tillage management.

MWS 2 – School Lake Minor Watershed (1401)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Soil erosion potential – high (HEL and steep slopes).	Tillage management, shoreland BMPs, urban BMPs.
2.	Steep slopes – high.	Riparian buffers,
3.	Existing wetlands – high.	Protect wetlands.

MWS 3 – Schneider Creek Minor Watershed (1400)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Animal units – medium.	Feedlot runoff control, livestock grazing.
2.	Existing wetlands – high.	Protect wetlands.
3.	Restorable wetlands – high.	Restore wetlands.

MWS 4 – Becker Lake Minor Watershed (5400)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Animal units – high.	Feedlot runoff control, livestock grazing.
2.	Existing wetlands – high.	Protect wetlands.
3.	Restorable wetlands – high.	Restore wetlands.

MWS 5 – Big Lake Minor Watershed (5600)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Soil erosion potential – high.	Tillage management, shoreland BMPs.
2.	Course textured soils – high.	Protect groundwater, ISTS programs.
3.	Restorable wetlands – high.	Restore wetlands.

MWS 6 – Horseshoe Minor Watershed (1602)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Soil erosion potential – high.	Shoreland BMPs.
2.	Course textured soils – high.	Protect groundwater, ISTS programs.
3.	Steep slopes – high.	Shoreland BMPs.

MWS 7 – East/Cedar Lake Minor Watershed (1601)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Animal units – high.	Feedlot runoff control, livestock grazing.
2.	Soil erosion potential – high.	Shoreland BMPs, tillage management.
3.	Course textured soils – high.	Protect groundwater, ISTS programs.

MWS 8 – Zumwalde Minor Watershed (1603)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Course textured soils – high.	Protect groundwater, ISTS programs.
2.	Steep slopes – high.	Shoreland BMPs.
3.	Soil erosion potential – medium.	Shoreland BMPs, tillage management.

MWS 9 – Great North Minor Watershed (1505)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Course textured soils – high.	Protect groundwater, ISTS programs.
2.	Steep slopes – high.	Shoreland BMPs.
3.	Soil erosion potential – low.	Shoreland BMPs, tillage management.

MWS 10 – Cold Spring Minor Watershed (1600)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Course textured soils – high.	Stormwater management (City of Cold Spring), protect groundwater, ISTS programs.
2.	Steep slopes – medium.	Shoreland BMPs.
3.	Soil erosion potential – medium.	Shoreland BMPs, tillage management.

MWS 11 – Knaus Lake Minor Watershed (1605)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Steep slopes – high.	Shoreland BMPs.
2.	Course textured soils – medium.	Stormwater management (City of Cold Spring), protect groundwater, ISTS programs.
3.	Soil erosion potential – low.	Shoreland BMPs, tillage management.

MWS 12 – Bolfig Lake Minor Watershed (1604)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Steep slopes – medium.	Shoreland BMPs.
2.	Course textured soils – medium.	Stormwater management (City of Cold Spring), protect groundwater, ISTS.
3.	Soil erosion potential – low.	Shoreland BMPs, tillage management.

MWS 13 – Kinzer Creek Minor Watershed (5700)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Steep slopes – high.	Shoreland BMPs, trout stream restoration
2.	Animal units – high.	Feedlot runoff control, livestock grazing.
3.	Cultivated land – high.	Tillage management.

MWS 14 – Long Lake Minor Watershed (1500)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Stream density – high.	Riparian buffers
2.	Animal units – high.	Feedlot runoff control, livestock grazing.
3.	Cultivated land – high.	Tillage management.

MWS 15 – Browns Lake Minor Watershed (1501)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Soil erosion potential – high.	Tillage management, shoreland BMPs.
2.	Stream density – high.	Riparian buffers
3.	Cultivated land – medium.	Tillage management.

MWS 16 – Eden Creek Minor Watershed (5900)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Cultivated land – high.	Tillage management, shoreland BMPs.
2.	Stream density – high.	Riparian buffers
3.	Animal units – medium.	Feedlot runoff control, livestock grazing.

MWS 17 – Eden Lake Minor Watershed (5901)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Steep slopes – high.	Shoreland BMPs, tillage management.
2.	Cultivated land – high.	Tillage management, shoreland BMPs.
3.	Stream density – medium.	Riparian buffers.

MWS 18 – Vail Lake Minor Watershed (5902)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Cultivated land – high.	Tillage management.
2.	Stream density – high.	Riparian buffers.
3.	Restorable wetlands – high.	Restore wetlands.

MWS 19 – Luxemburg Minor Watershed (0600)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Cultivated land – high.	Tillage management.
2.	Animal units – high.	Feedlot runoff control, livestock grazing.
3.	Stream density – high.	Riparian buffers.

MWS 20 – Manannah Minor Watershed (0700)

	Minor Watershed Assessment Results	Generalized Strategies
1.	Cultivated land – high.	Tillage management.
2.	Existing wetlands – high.	Protect wetlands.
3.	Stream density – high.	Riparian buffers.

Summary of the MWA

In summary, the MWA tool helped the SRCL gain a better understanding of the water resource management issues at the minor watershed level. The following is a summary of those trends:

- Land Cover Change. There have been drastic changes in the amount and types of land cover over the past 100 years in the watershed that drains into the Sauk River Chain of Lakes.
- Increased Phosphorus Export. As a result, the amount of phosphorus that runs off into the SRCL and the Sauk River has greatly increased.
- Agricultural Uses Dominate the SRCL Sublakeshed. Over five out of every eight acres in the SRCL Sublakeshed is cultivated. Small reductions in erosion on each acre of tilled land can make big reductions in phosphorus runoff.
- Direct Minor Watersheds. The minor watersheds that more drain directly into the lakes tend to have more areas of coarse textured soils. Groundwater issues will tend to be more of a priority in these areas.
- Targeted Management. From the detailed inventory and assessment developed for this Plan, it became clear that **each of the 20 minor watersheds in the SRCL Sublakeshed is unique** with very different land and water management issues and concerns. The minor watershed assessment tool was instrumental in explaining that a different set of management strategies is needed for each minor watershed to help target limited resources to more effectively reduce non-point pollution.
- Good News. If management strategies can be effectively implemented for both the agricultural and shoreland/urban developed areas of the SRCL Lakeshed, significant reductions in phosphorus levels in the lakes and Sauk River could be realized.

So who is responsible?

The short answer is, we all are responsible for increased phosphorus loads being transported into our lakes and streams. Yet, implementing projects that will remove non-point pollution requires involvement of not only a collaboration of local organizations and resource agencies but also many individual landowners.

The MWA tool provides the SRCL and resource managers a targeted approach to identifying management strategies that can more effectively reduce the export of phosphorus into streams and lakes. Through this type of analysis, resource managers will be better able to identify specific areas within minor watersheds where efforts are needed to minimize non-point pollution.

The intent of this assessment process is not to single out individual landowners but rather identify what is needed to improve water quality and to coordinate the resources necessary to correct the problems. There are many programs and funding and technical resources that the Stearns SWCD, SRWD, and host of state and federal agencies can bring to help make projects work economically and technically.

Building the political support and acceptance by landowners whether they live on one of the lakes, in one of the area cities, or on a farm; is essential to improving water quality from a non-point perspective. Creating and sustaining working partnerships with all landowners is one of the key roles for the SRCL and local leaders from the SRCL Sublakeshed.

A key role for resource agencies will be to compliment the SRCL's efforts and use the MWA as a fast and effective means to target water quality programs and projects. It will take a coordinated effort by all agencies and the SRCL and landowners to address the non-point pollution challenge.

Minor Watershed Recommendations

This Plan includes strategic and targeted goals, objectives and actions to work with landowners and resource agencies to address significant water quality problems at the minor watershed level.

The SRCL offers the following recommendations to the resource agencies working in the SRCL Lakeshed to consider as they manage their programs and operations:

1. Think Minor Watershed. The SRCL encourages all resource agencies to work on a minor watershed basis when assisting landowners in the SRCL Sublakeshed on conservation or water and land resource management projects.
2. Assess/Implement on a Minor Watershed Basis. The SRCL encourages all resource agencies to use the results from the minor watershed assessment process to guide which programs and projects they will provide to assist landowners in the SRCL Sublakeshed on conservation or water and land resource management projects.
3. Prioritize Investments. All resource agencies should refer to and use the priorities established by the minor watershed assessment to guide the investment of public dollars into the various programs when working in the SRCL Sublakeshed.

4. SRCL Input. The SRCL should request periodic and ongoing opportunities to provide input on the priority setting process for all agency activities where public funds are being expended.
5. Annual Reports by Agencies. The SRCL should request that all resource agencies working in the SRCL Sublakeshed prepare a written annual report that documents all their accomplishments in the SRCL Sublakeshed. All projects and programs should be listed on a minor watershed basis with a summary of what results have been achieved and what the costs have been. The report should identify players who have partnered on the projects and what their roles have been on the projects.
6. Annual Implementation Review Meetings. The SRCL recommends that resource agencies meet with the lake association on an annual basis to review and discuss the results of implementation and monitoring activities in the SRCL Sublakeshed.
7. Water Quality Monitoring. The SRCL will work with the SRWD and other resource agencies to develop a coordinated water quality monitoring program for the 20 minor watersheds in the SRCL Sublakeshed. It will provide volunteers to assist in the various monitoring programs and support the SRWD in a centralized role in data collection, analysis and management for the Sauk River major watershed. The SRCL recognizes the need to continue monitoring on established sites and to place new monitoring sites in strategic locations. The SRCL recommends that the SRWD and other agencies involved in monitoring use the 20 minor watersheds as part of the hydrologic framework for establishing and maintaining the monitoring network. The SRCL recognizes the potential cost associated with monitoring all 20 minor watersheds and encourages the establishment of a transparency tube monitoring network over the 20 minor watersheds to compliment the water quality chemistry monitoring program. The SRCL will help coordinate a volunteer team to conduct transparency tube monitoring of the 20 minor watersheds in the SRCL Sublakeshed.
8. Upstream Efforts. The SRCL recognizes that the watershed area upstream of the SRCL Sublakeshed generates a substantial amount of phosphorus that ultimately flows into the Chain of Lakes. The SRCL recommends that the SRWD develop similar minor watershed assessments for all of its subwatershed management areas above the SRCL Sublakeshed (aka the SRWD Water Management District # 7 – Chain of Lakes) and develop targeted strategies on a minor watershed basis to significantly reduce phosphorus and other non-point pollutants from entering into the Sauk River and being transported into the Chain of Lakes. The SRCL recommends the SRWD to set a timetable in which it will complete the assessment process and adopt an implementation program to implement the targeted strategies.