Rice Lake TMDL Implementation Plan

Prepared for:
NORTH FORK CROW RIVER WATERSHED DISTRICT

MINNESOTA POLLUTION CONTROL AGENCY

May 2012

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1.0 Introduction

The purpose of this implementation plan is to address nutrient Load and Wasteload Allocations presented in the Total Maximum Daily Load (TMDL) impairments for Rice Lake (DNR #73-0196) located in the North Fork Crow River (NFCR) HUC (07010204), Upper Mississippi River Basin in Stearns County, Minnesota (Figure 1.1). The numeric water quality standards for Rice Lake is a summer average total phosphorus concentration of 40 µg/L, 14 µg/L chlorophyll-a, and greater than 1.4 meter in Secchi depth. Current water quality does not meet state standards for nutrient concentration for deep lakes in the North Central Hardwood Forest ecoregion.

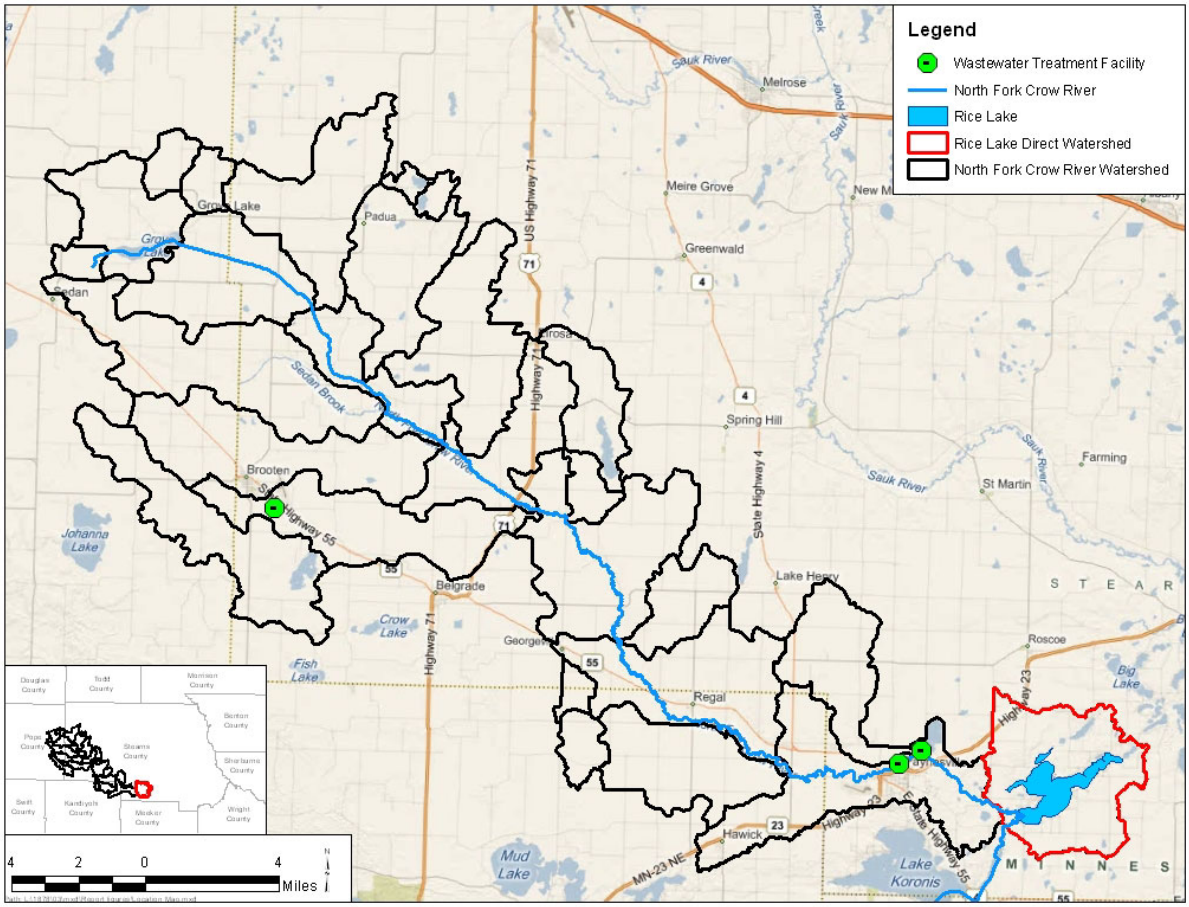

Figure 1.1. Location Map

Land use in the Rice Lake watershed is predominantly agriculture (>50%) including row crops (corn soybean rotation) and animal agriculture. Rice Lake has four major basins; three of which have an average depth greater than 10 feet (L1, L2 and L4) while one basin, L3, has an average depth of 7 feet. The North Fork Crow River drains approximately 162,122 acres above Rice Lake and flows in and out of the lake through the southwest basin. The lake has a history of carp and curly-leaf pondweed infestation.

A nutrient budget was developed for Rice Lake as well as a lake response model to set the Load and Wasteload Allocations. Phosphorus sources to Rice include North Fork Crow River watershed runoff (93%), direct watershed runoff (2%) and internal sediment release of phosphorus (4%) with the remaining phosphorus coming from atmospheric deposition. The TMDL allocation for all four Rice Lake basins to meet state water quality standards is 29,684 pounds per year (43% reduction).

The primary sources of phosphorus for Rice Lake include runoff from an agricultural watershed with both row crops and animal agriculture. Based on a Unit Area Load (UAL) model and agricultural animal counts throughout the watershed, the primary source of nutrients is from animal manure. There are over 55,000 animal units in the North Fork Crow River and Rice Lake direct watersheds which produce over 5.3 million pounds of phosphorus per year. A large proportion of this manure is land applied throughout the watershed and has the potential to eventually make its way into surface waters. Nutrient management in the Rice Lake watershed will need to focus on manure management. Sediment phosphorus release rates in the deep basins of Rice Lake were high compared to typical release rates in healthy mesotrophic lake ecosystems. So while the internal nutrient load (4%) may appear small compared to the total watershed load, sediment loading should be addressed through internal load controls.

2.0 Rice Lake TMDL Summary

A key aspect of a TMDL is the development of an analytical link between loading sources and receiving water quality. To establish the link between phosphorus loading to the quality of water in Rice Lake, monitoring data extending back to 1995 was reviewed to better understand conditions and trends. Other data examined include fish and vegetation survey results compiled by the DNR.

2.1 CURRENT WATER QUALITY

Water quality in Minnesota lakes is often evaluated using three associated parameters: total phosphorus, chlorophyll-a, and Secchi depth. Total phosphorus is typically the limiting nutrient in Minnesota's lakes meaning that algal growth will increase with increases in phosphorus. However, there are cases where phosphorus is widely abundant and the lake becomes limited by nitrogen availability. Chlorophyll-a is the primary pigment in aquatic algae and has been shown to have a direct correlation with algal biomass. Since chlorophyll-a is a simple measurement, it is often used to evaluate algal abundance rather than expensive cell counts. Secchi depth is a physical measurement of water clarity measured by lowering a black and white disk until it can no longer be seen from the surface. Higher Secchi depths indicate less light refracting particulates in the water column and better water quality. Conversely, high total phosphorus and chlorophyll-a concentrations point to poor water quality. Measurements of these three parameters are interrelated and can be combined into an index that describes water quality.

2.1.1 Total Phosphorus

Summer average total phosphorus concentrations in Rice Lake consistently exceeded the state standard of 40 µg/L at all monitoring stations (Figure 2.1). The highest summer average concentration was 78 µg/L in basin L2 in 2002. Data collected in each lake basin suggests minimal spatial variability in average annual total phosphorus between the 4 basins in any one year and no consistent pattern from year to year.

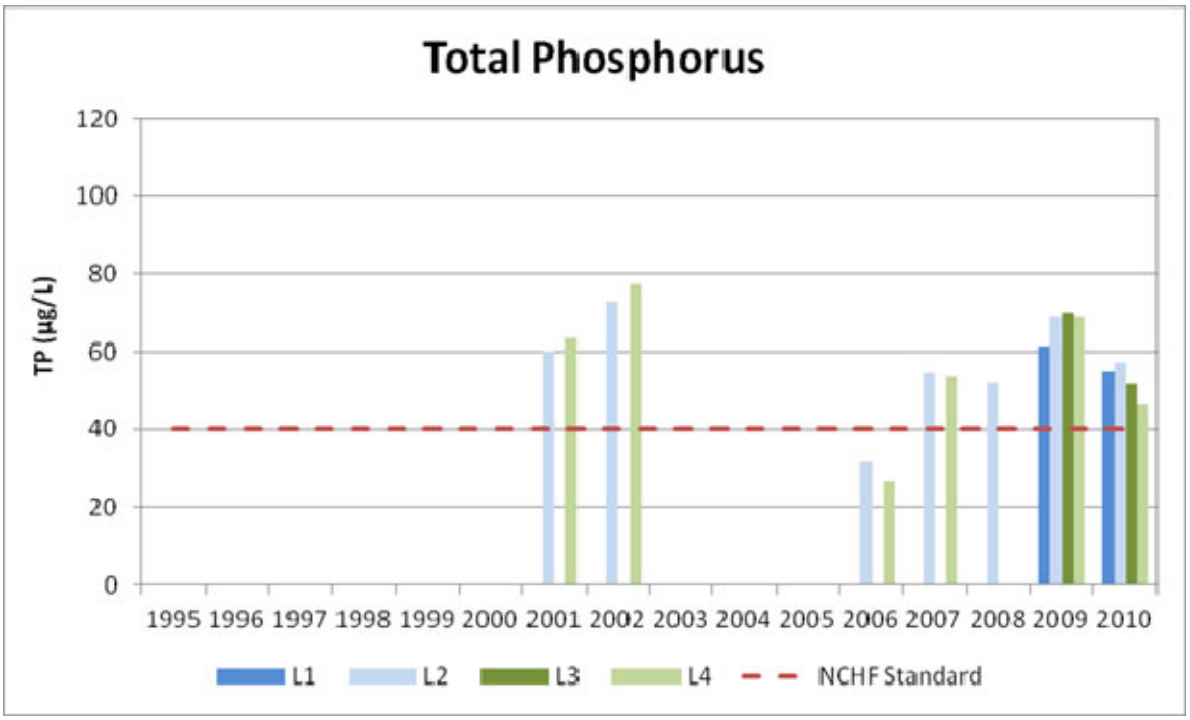

Figure 2.1. Summer (June 1 –September 30) mean total phosphorus concentrations for all four Rice Lake basins. The dotted red line indicates the current State standard for the Northern Central Hardwood Forest ecoregion. Only sampling seasons with four or more measurements are displayed.

2.1.2 Chlorophyll-a

From 1995 to 2010, chlorophyll-a concentrations in Rice Lake basins L2 and L4 ranged from 9 to as high as 65 µg/L in years with four samples or more during the summer season. Chlorophyll-a concentrations over 14 µg/L are in violation of the state standard and indicate a high incidence of nuisance algae blooms. Similar to total phosphorus, chlorophyll a concentrations demonstrated little variation between the four basins in 2009 and 2010 (Figure 2-2).

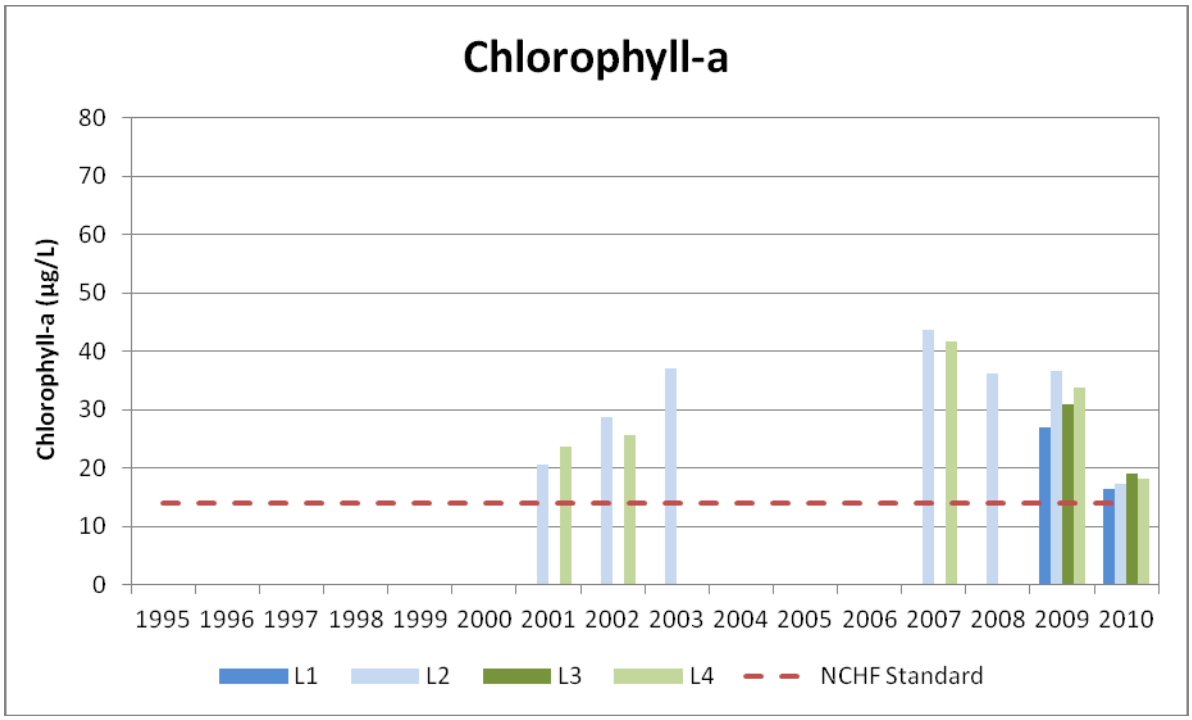

Figure 2.2. Summer (June 1 –September 30) mean chlorophyll a concentrations for all four Rice Lake basins. The dotted red line indicates the current State standard for the Northern Central Hardwood Forest ecoregion. Only sampling seasons with four or more measurements are displayed.

2.1.3 Secchi Depth

Water clarity (Secchi depth) in general follows the same trend as TP and chlorophyll-a. Mean summer Secchi depths have been below the state standard of 1.4 meters in multiple years for basins L1, L2 and L4 (Figure 2-3). 2009, 2010 and long-term data suggest basins L1-L3 have similar water clarity while L4 exhibits slightly higher clarity during certain years. There are no apparent temporal trends in the Secchi depth data suggesting that the lake has demonstrated similar water quality over the past 30 years.

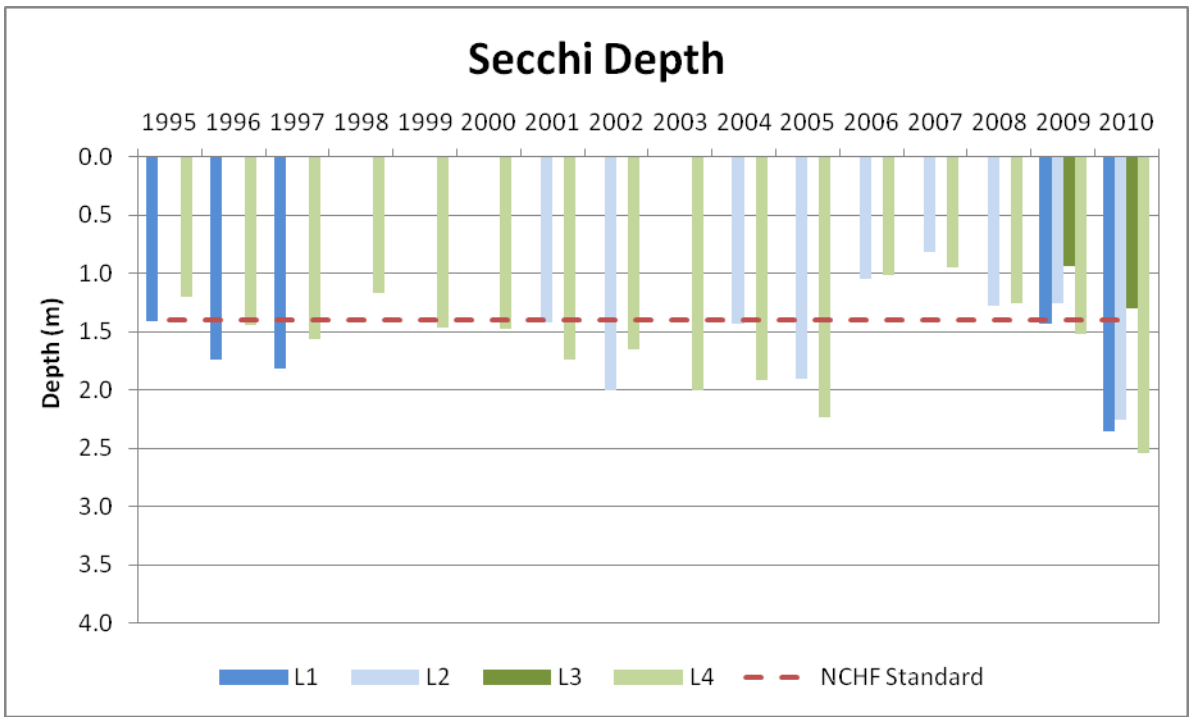

Figure 2.3. Summer (June 1 –September 30) mean secchi depth for all four Rice Lake basins. The dotted red line indicates the current State standard for the Northern Central Hardwood Forest ecoregion. Only sampling seasons with four or more measurements are displayed.

2.2 IMPAIRED WATERS AND MINNESOTA WATER QUALITY STANDARDS

Rice Lake is located in the North Central Hardwood Forest ecoregion and is designated as a class 2B water. The Class 2B designation specifies aquatic life and recreation as the protected beneficial use of the water body.

Minnesota's standards for nutrients limit the quantity of nutrients which may enter surface waters. Minnesota's standards at the time of listing (Minnesota Rules 7050.0150(3)) stated that in all Class 2 waters of the State "…there shall be no material increase in undesirable slime growths or aquatic plants including algae." In accordance with Minnesota Rules 7050.0150(5), to evaluate whether a water body is in an impaired condition the MPCA developed "numeric translators" for the narrative standard for purposes of determining which lakes should be included in the section 303(d) list as being impaired for nutrients. The numeric translators established numeric thresholds for phosphorus, chlorophyll-a, and clarity as measured by Secchi depth.

The numeric target used to list Rice Lake was the phosphorus standard for Class 2B waters in the North Central Hardwood Forest ecoregion (40 µg/L); this TMDL presents load and wasteload allocations and estimated load reductions for the 40 µg/L target. Although the TMDL is set for the total phosphorus standard, the two other lake eutrophication standards (chlorophyll-a and Secchi depth) must also be met (Table 2.1). All three of these parameters were assessed in this

TMDL to assure that the TMDL will result in compliance with state standards. Numeric standards applicable to Rice Lake for chlorophyll-a and Secchi depth are 14 µg/L and 1.4 meters, respectively, as a growing season mean. All values are growing season means.

Table 2.1. Numeric targets for deep lakes in the North Central Hardwood Forest ecoregion.

Parameters	North Central Hardwood Forest
Phosphorus Concentration (µg/L)	40
Chlorophyll-a Concentration (µg/L)	14
Secchi disk transparency (meters)	>1.4

2.3 TOTAL MAXIMUM DAILY LOAD CALCULATIONS

The numerical TMDL for Rice Lake was calculated as the sum of the Wasteload Allocation, Load Allocation and the Margin of Safety (MOS) expressed as phosphorus mass per unit time. Nutrient loads in this TMDL are set for phosphorus, since this is typically the limiting nutrient for nuisance aquatic algae. This TMDL is written to solve the TMDL equation for a numeric target of 40 µg/L of total phosphorus.

2.3.1 Summary of TMDL Allocations

Table 2.2 summarizes the TMDL allocations for Rice Lake. A 4.1 pounds per day margin of safety is explicit in the TMDL equation. An overall 53% nutrient reduction is required for Rice Lake to meet the state standard of 40 µg/L as a summer average. To achieve this TMDL, a 78% reduction in internal loading will be needed along with a 62% reduction in direct watershed loading and a 52% reduction from the North Fork Crow River watershed.

Table 2.2. TMDL total phosphorus daily loads partitioned among the major sources for Rice Lake assuming the lake standard of 40 µg/L.

Allocation	Source	Existing TP Load[1]		TP Load Allocations		Load Reduction	
		(lbs/year)	(lbs/day)	(lbs/year)	(lbs/day)[2]	(lbs/year)	Percent
Waste Load	Const. Stormwater	--	--	297	0.8	--	--
	Indust. Stormwater	--	--	148	0.4	--	--
	CAFO(s)	--	--	0	0.0	--	--
	NPDES point sources	509	1.4	3,144	8.6	--	--
Load	Atmospheric	392	1.1	392	1.1	--	0%
	Direct watershed	1,010	2.8	381	1.0	629	62%
	NFC River watershed	49,212	134.7	23,393	64.0	25,819	52%
	Internal Load	2,042	5.6	445	1.2	1,597	78%
Margin of Safety		--	--	1,484	4.1	--	--
Total		53,165	145.6	29,684	81.2	28,045	53%

[1] Existing load is the average for the years 2009-2010.
[2] Annual loads converted to daily by dividing by 365.25 days per year accounting for leap years

3.0 Implementation Framework

3.1 IMPLEMENTATION PLAN PRINCIPLES

Through the discussion of policies and practices, current activities, and ongoing research, the stakeholders will develop principles to guide development and implementation of the load reduction plan. These principles, in no order, will include:

1. Restore Biological Integrity

A healthy biological community is an important piece to all lake restoration projects to provide internal controls on nutrients and water clarity. To that end, the stakeholders agree to work cooperatively to restore the biological communities in Rice Lake, including fish, plants, and zooplankton.

2. Control Internal Load

Internal loading should be addressed in order to meet TMDL nutrient reduction goals. Internal loading must be addressed to successfully improve water quality in this lake. Rice Lake stakeholders will work cooperatively to reduce internal phosphorus loading in the lake.

3. Implement BMPs in the Watershed

As changes to the watershed occur such as development, road construction, or land use changes, the stakeholders will implement watershed BMPs where practical and feasible.

4. Encourage Communication

Stakeholder meetings are a useful forum for discussion and sharing. Opportunities to share ideas and experiences to widen the knowledge base should be part of the implementation plan.

5. Foster Stewardship

The stakeholders recognize the need to develop a conservation attitude toward Rice Lake and its watershed. To develop this attitude, the stakeholders will work together to foster stewardship of the lake and its watershed through cooperative projects, meetings, and a mutual understanding between stakeholders.

6. Communicate with the Public

Educational opportunities should take a variety of forms, and should include both general and specialized information, targeted but not limited to:

- General public
- Elected and appointed officials
- Private applicators
- Property managers

3.2 IMPLEMENTATION APPROACH

When establishing a TMDL, reasonable assurance must be provided demonstrating the ability to reach and maintain water quality endpoints. Several factors control reasonable assurance, including a thorough knowledge of the ability to implement BMPs as well as the overall effectiveness of the BMPs. This TMDL establishes aggressive goals for the reduction of phosphorus loads to Rice Lake.

TMDL implementation will be implemented on an iterative basis so that implementation course corrections based on periodic monitoring and reevaluation can adjust the strategy to meet the standard. After the first phase of nutrient reduction efforts, reevaluation will identify those activities that need to be strengthened or other activities that need to be implemented to reach the standards. This type of iterative approach is more cost effective than over engineering to conservatively inflated margins of safety. Implementation will also address other lake problems not directly linked to phosphorus loading such as invasive plant species (curly-leaf pondweed) and invasive fish (carp and rough fish). These practices go beyond the traditional nutrient controls and provide additional protection for lake water quality.

3.3 STAKEHOLDER RESPONSIBILITIES

Implementation of the proposed actions will be conducted in partnership by the stakeholders in the watershed. Each of the stakeholders has different mechanisms for ensuring the practices get implemented throughout the Rice Lake watershed. The North Fork Crow River Watershed District (NFCRWD), the Crow River Organization of Waters (CROW) and local County Soil and Water Conservation Districts (SWCDs) will implement many activities through their comprehensive plans and local ordinances. The MPCA and DNR will implement activities through regulation and monitoring as well as providing technical assistance to the stakeholders. The Rice Lake Association will implement BMPs through local partnerships with the appropriate agencies.

3.3.1 North Fork Crow River Watershed District

The North Fork Crow River Watershed District is governed by a board of five managers appointed by the Pope, Kandiyohi, Stearns and Meeker Counties Board of Commissioners. The District's primary purpose is the conservation of the quality and quantity of water within the Watershed District Boundary. The NFCRWD has drainage authority of all county and judicial ditch systems located within the boundaries of the Watershed District. A major goal of the NFCRWD Comprehensive Water Management Plan is to minimize or reduce priority pollutants to sustainable levels. Some strategies for achieving this goal include:

- Supporting efforts by local units of government in the District to develop, adopt and administer performance standards that protect water resources
- Working to minimize pollution from key areas, such as from wastewater plants, industrial sites, and similar easily recognizable sources commonly referred to as 'point source pollution'

- Assisting district residents with implementing Best Management Practices
- Reducing erosion and controlling sediment where possible
- Assisting with identifying priority areas for implementation activities
- Continued surface water quality monitoring efforts within the District

3.3.2 Crow River Organization of Water

Portions of ten counties in Central Minnesota make up the Crow River Watershed. From the perspective of the Upper Mississippi River Basin, the Crow River is one of its major tributaries. The effects of rapid urban growth, new and expanding wastewater facilities and erosion from agricultural lands have been common concerns of many citizens, local, state and regional governments in Central Minnesota. As a result, many groups began meeting in 1998 to discuss management of the Crow River basin consisting of the North Fork and South Fork. The Crow River Organization of Water (CROW) was formed in 1999 as a result of heightened interest in the Crow River. A Joint Powers Agreement has been signed between all ten of the Counties with land in the Crow River Watershed. The CROW Joint Powers Board is made up of one representative from each of the County Boards who signed the agreement. The Counties involved in the CROW Joint Powers include Carver, Hennepin, Kandiyohi, McLeod, Meeker, Pope, Renville, Sibley, Stearns and Wright. The CROW currently focuses on identifying and promoting the following:

- Protecting water quality and quantity
- Protect and enhance fish and wildlife habitat and water recreation facilities
- Public education & awareness
- BMP implementation

In summer of 2010, the CROW began working with the Minnesota Pollution Control Agency's new Major Watershed Restoration & Protection Project (MWRPP) approach in the North Fork Crow River Watershed. The idea behind the watershed approach is to provide a more complete assessment of the water quality and facilitates data collection for the development of Total Maximum Daily Loads (TMDLs) and protection strategies. The watershed approach is to intensively monitor the streams and lakes within a major watershed to determine the overall health of the water resources, identify impaired waters, and identify those waters in need of additional protection efforts to prevent impairments. This process is different from the previous approach because monitoring efforts were concentrated in a defined area (a lake or stream reach) and addressed one impairment, whereas now, all impairments are addressed at the same time. Most importantly, this process will provide a communication tool that can inform stakeholders, engage volunteers, and help coordinate local/state/federal monitoring efforts. This process will ensure the data necessary for effective water resources planning is available, citizens and stakeholders are engaged in the process, and citizens and governments across Minnesota can evaluate the progress. The MWRPP approach will result in a Watershed Management Plan for North Fork Crow Watershed that covers the Rice Lake watershed.

3.3.3 County Soil and Water Conservation Districts

The Rice Lake watershed is primarily situated in Stearns County, with smaller portions in Kandiyohi and Pope Counties. The County Soil and Water Conservation Districts (SWCD) for these three counties manage and direct natural resource management programs at the local level. Their mission is to provide local leadership in the conservation of soil, water, and related natural resources through programs and partnerships with individuals, businesses, organizations and the government. They are particularly concerned with erosion of soil due to wind and water. The SWCDs are heavily involved in the implementation of practices that effectively reduce or prevent erosion, sedimentation, siltation, and agricultural-related pollution in order to preserve water and soil as resources. The Districts frequently act as local sponsors for many types of projects, including grassed waterways, on-farm terracing, erosion control structures, and flow control structures. The NFCRWD has established close working relationships with the SWCDs on a variety of projects.

3.3.4 Rice Lake Association

With over 100 members, The Rice Lake Association is a very active group that is devoted to the health and recreational quality of Rice Lake. Since its inception 25 years ago, the Rice Lake Association has been a strong proponent of and has assisted with numerous special studies and clean water projects. Rice Lake Association is organized to address the following goals and objectives:

- Improve the water and recreational quality of Rice Lake through promotion of sound lake management practices
- Educate members regarding issues that affect lakeshore
- Advocate members' interests before governmental bodies in matters involving Rice Lake
- Promote research and appropriate standards for proper management of Rice Lake, the North Fork Crow River, and surrounding tributaries
- Seek enforcement of laws that affect Minnesota lakes and watersheds

3.4 ADAPTIVE MANAGEMENT

The load allocations in the TMDL represent aggressive goals for nutrient reductions. Consequently, implementation will be conducted using adaptive management principles. Adaptive management is an iterative approach of implementation, evaluation, and course correction (see Figure 3.1). It is appropriate here because it is difficult to predict the lake response to load reductions. Future conditions and technological advances may alter the specific course of actions detailed in this Plan. Continued lake water quality monitoring and course corrections responding to monitoring results offer the best opportunity for meeting the water quality goals established in this TMDL.

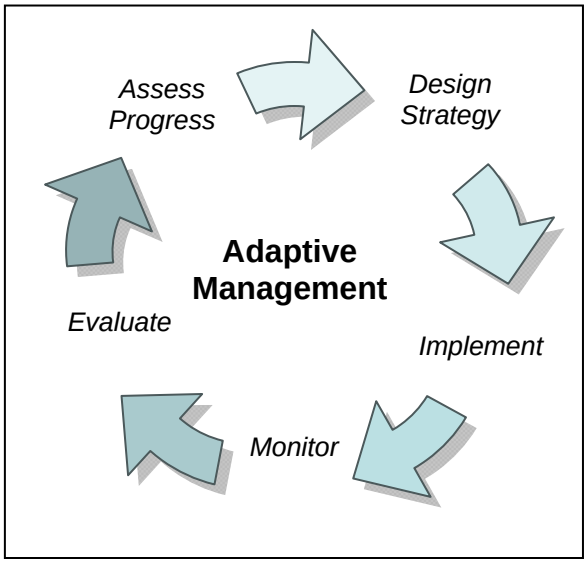

Figure 3.1. Adaptive management

4.0 Monitoring and Education

Restoration of Rice Lake requires participation from all of the stakeholders, especially the land owners in the watershed as well as lake users. Consequently, education and outreach will be a key component in successfully achieving implementation goals. Additionally, because implementation of this TMDL relies heavily on adaptive management, monitoring will be an important part of the implementation plan.

4.1 GENERAL COORDINATION

4.1.1 Coordination

Implementation of the activities outlined in this plan will be the responsibility of each of the individual stakeholders. The NFCRWD, CROW and local SWCDs will track progress toward achieving their Comprehensive Plans and ultimately the activities necessary for achieving the TMDL. The Rice Lake Association will work with each group to report activities the Association achieves related to the implementation plan.

Estimated Cost: 5 hours/month staff time
Responsible Parties: NFCRWD, CROW, Stearns, Kandiyohi and Pope SWCDs and Rice Lake Association

4.2 EDUCATION

Another key component of any good implementation plan is education. Education will be a critical part of implementing this TMDL and includes the following tasks.

4.2.1 Lake Shore and Watershed Land Management

Work with property owners in the direct subwatershed to ensure proper fertilizer use, low-impact lawn care practices, and other topics to increase awareness of sources of pollutant loadings to Rice Lake and encourage the adoption of good individual property management practices. The NFCRWD and Rice Lake Association will take the lead in education and outreach programming with participation and assistance by the county, DNR, MPCA, CROW, Stearns County SWCD, and other interested agencies.

Estimated Cost: $2,000 annually
Responsible Parties: NFCRWD, Stearns County SWCD, Rice Lake Association, CROW, DNR, MPCA

4.2.2 Public Education and Outreach

The Minnesota and Wisconsin Departments of Natural Resources, the University of Minnesota Extension Service, and University of Wisconsin Extension have prepared numerous fliers and

brochures on various topics relating to lake management that can be made available to target audiences at city meetings, National Night Out gatherings, and other opportunities, and links posted on the NFCRWD web site.

Estimated Cost: $2,000 annually
Responsible Parties: NFCRWD, Rice Lake Association, CROW

4.2.3 Encourage Public Official and Staff Education

There is a need for city, county and state officials and staff to understand the TMDL and the proposed implementation activities so that they can effectively make regulatory, budget and programming decisions and conduct daily business. Resources such as self-study lake management background information from Water on the Web ("Understanding Lake Ecology"), Project NEMO (Nonpoint Education for Municipal Officials), UW Extension ("Understanding Lake Data") and other sources would provide basic information about lake ecology to help staff, Councils and Commissions make informed decisions about lake management.

Estimated Cost: $2,000 annually
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope SWCD, CROW

4.2.4 Demonstration Projects

Property owners may be reluctant to adopt good lake management practices without examples they can evaluate and emulate. The stakeholders will encourage new demonstration projects so property owners can see how a project or practice is implemented and how it looks. New demonstration projects might include planting native plants; planting a rain garden; restoring a shoreline; managing turf using low-impact practices such as phosphorus-free fertilizer, reduced herbicides and pesticides, and proper mowing and watering techniques; and improving drainage practices with redirected downspouts and rain barrels.

Estimated Cost: $5,000 annually
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope SWCDs, Minnesota DNR, CROW

4.3 ONGOING MONITORING

4.3.1 Rice Lake Water Quality Monitoring

Monitoring water quality to assess progress in achieving the TMDL is a critical element in the adaptive management approach identified in the TMDL. Monthly Water quality monitoring will be conducted on Rice Lake including dissolved oxygen, temperature, total phosphorus, chlorophyll-a, secchi depth and total Kjeldahl nitrogen.

Estimated Cost: $5,000 per season

Responsible Parties: NFCRWD

4.3.2 North Fork Crow River Water Quality Monitoring

Approximately 93% of the Rice Lake phosphorus budget is from the North Fork Crow River. Thus, monitoring the North Fork Crow River inflow to Rice Lake will be critical in understanding watershed loading to the lake as well as evaluating the effects of management in the watershed. The MPCA currently maintains a monitoring station on the North Fork Crow River near the inlet to Rice Lake. The NFCRWD has an extensive monitoring program, including Rice Lake inlet and outlet, collecting data for nutrients and flow. These monitoring programs will be continued in the future to support this implementation plan.

Estimated Cost: $5,000 annually
Responsible Parties: MPCA, NFCRWD

4.3.3 Vegetation Monitoring

Aquatic plants should periodically be surveyed on Rice Lake to track changes in the plant community and monitor growth and extent of nuisance species. Routine aquatic plant surveys will be critical in understanding the overall functioning of the lake and its response to water quality changes. DNR surveys show curly-leaf pondweed is currently present in Rice Lake. Senescence of the curly-leaf pondweed in summer can be a significant source of internal phosphorus load that often results in a late summer nuisance algal bloom. A curlyleaf pondweed survey should be conducted in the first year of implementation to assess the species abundance and potential contribution to internal loading. Overall vegetation surveys should be conducted every three years in conjunction with water quality monitoring.

Estimated Cost: $5,000 for early and late season curlyleaf pondweed survey
Responsible Parties: Minnesota DNR, NFCRWD, Rice Lake Association

4.3.4 Fish Monitoring

The Minnesota DNR routinely monitors Rice Lake fish communities and maintains a fish management plan. Continuation of the fish monitoring will be sufficient to evaluate the overall fish community in Rice Lake. However, a large carp population has likely historically existed in Rice Lake. A specific carp assessment should be conducted in conjunction with the periodic DNR fish surveys.

Estimated Cost: $20,000 for rough fish assessment
Responsible Parties: Minnesota DNR, NFCRWD, Rice Lake Association

5.0 Watershed Activities

The primary watershed sources to Rice Lake include runoff from agricultural fields receiving manure and animal agriculture because they comprise such a large proportion of the watershed. Following is a description of the approach to be taken to address each of these sources.

5.1 ANIMAL AGRICULTURE

Animal agriculture and associated manure management were identified as important nutrient sources to Rice Lake (Figure 5.1). The focus of implementation will be on better management of manure and feedlots to reduce nutrient loading to surface waters. Several practices will be considered to reduce nutrient loads from land receiving animal manure including those outlined in the following sections.

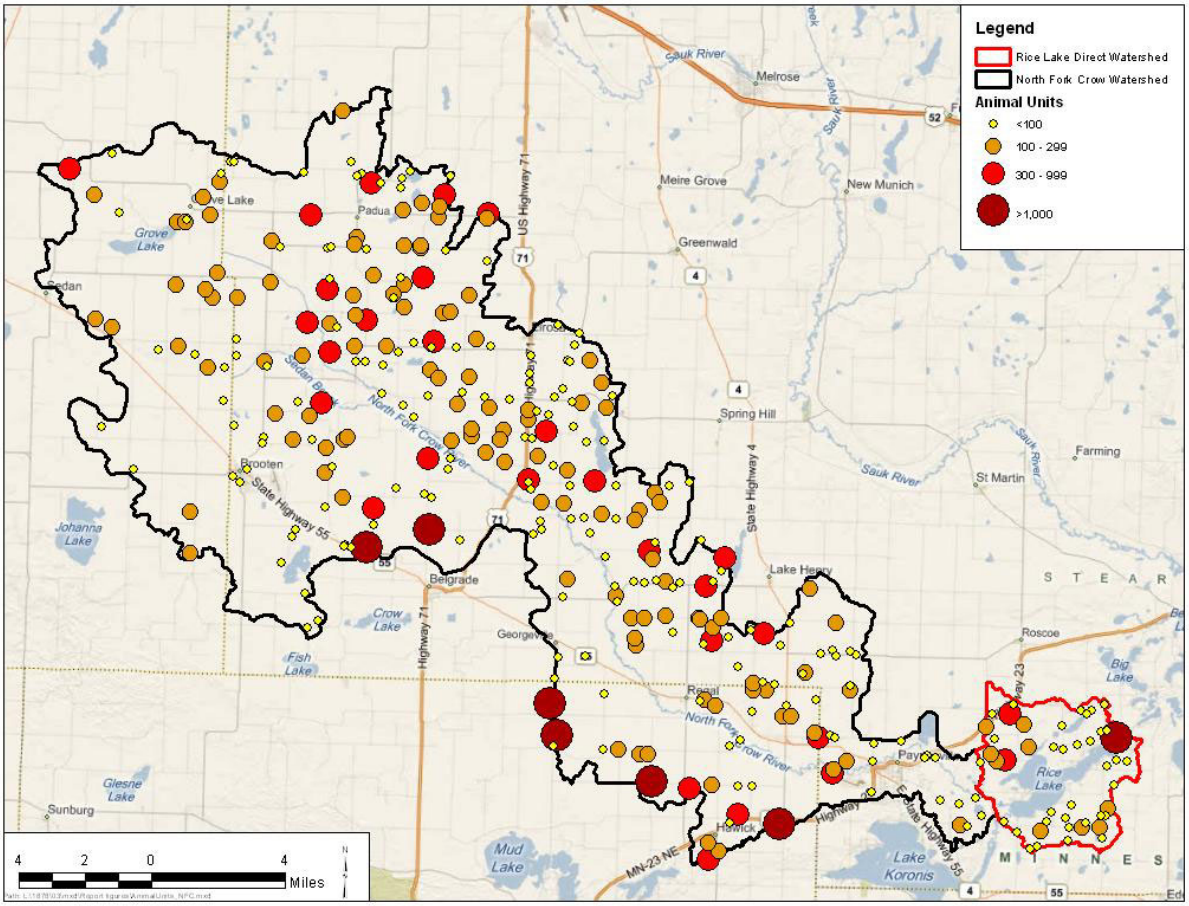

Figure 5.1. Animal units in the Rice Lake watershed based on the 2010 MPCA database.

5.1.1 Feedlot and Manure Stockpile Management Program

One of the first places to start when managing animal agriculture in the watershed is feedlots. The county governments are delegated to regulate all non CAFO feedlots. MPCA regulates all CAFOs. Regulating includes permitting, compliance and inspections. Feedlots that meet these regulations will not discharge significant amounts of nutrients to surface waters.

There are a variety of options for controlling feedlot and manure stockpile runoff that reduce nonpoint source nutrient loading, including:

- Move fences or altering layout of feedlot
- Eliminate open tile intakes and/or feedlot runoff to direct intakes
- Install clean water diversions and rain gutters
- Install grass buffers
- Maintain buffer areas
- Construct solid settling area(s)
- Prevent manure accumulations
- Manage feed storage
- Manage watering devices
- Total runoff control and storage
- Install roofs
- Runoff containment with irrigation onto cropland/grassland
- Vegetated infiltration areas or tile-drained vegetated infiltration area with secondary filter strips

These practices should be applied where appropriate.

Estimated Cost: Staff time
Responsible Parties: Stearns, Kandiyohi and Pope County SWCDs, NFCRWD, MPCA

5.1.2 Manure Management Plans

Another important component of managing animal waste is developing manure management plans. Minnesota feedlot rules (Minn. R. ch. 7020) now require manure management plans for feedlots greater than 300 animal units that do not employ a certified manure applicator. These plans require manure accounting and record-keeping as well as manure application risk assessment based on method, time and place of application and manure and soil testing. The following BMPs will be considered in all manure management plans to reduce potential nutrient delivery to surface waters:

- Immediate incorporation of manure into topsoil
- Reduction of winter spreading, especially on slopes
- Eliminate spreading near open inlets and sensitive areas
- Erosion control through conservation tillage and vegetated buffers
- Consider changing from N based to P based MMP

The focus of these plans is to develop acceptable nutrient loads to the field to prevent nutrient saturation and eventual runoff to surface waters. Soil and manure testing are required in these plans to determine the acceptable amount of manure and associated nutrients that can be applied to the watershed.

Additional technologies can be evaluated including chemical addition to manure prior to field application to reduce phosphorus availability and mobility. These technologies can improve phosphorus retention on fields allowing for more flexibility for manure management.

Estimated Cost: Staff time
Responsible Parties: Stearns, Kandiyohi and Pope County SWCDs, NFCRWD

5.1.3 Buffers and Fencing along Pastures

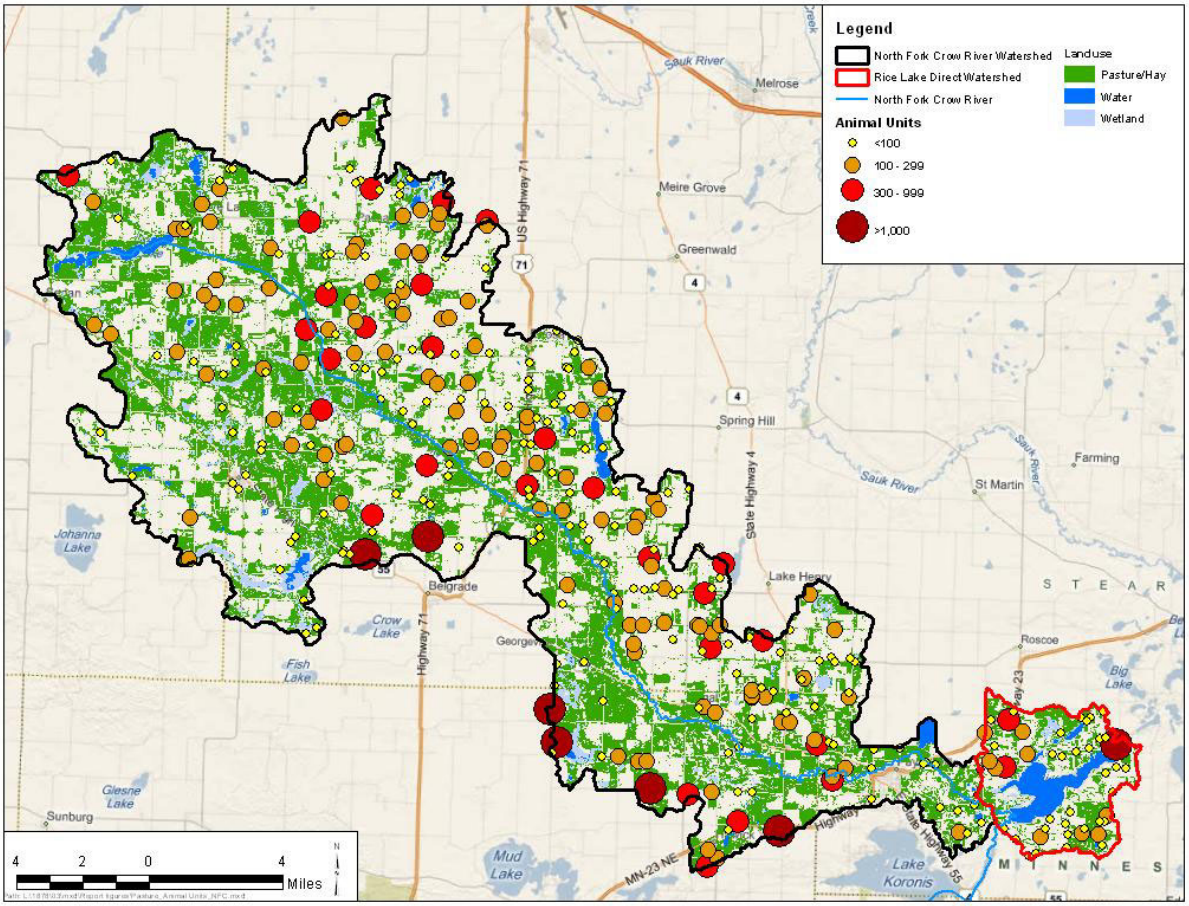

Figure 5.2. Feedlots and pasture areas in the Rice Lake watershed based on 2007 National Agriculture Statistical Survey (NASS).

Pastures that allow animals direct access to surface waters or provide runoff directly to surface waters have a high potential to deliver nutrients to surface waters. The following livestock

grazing practices are for the most part economically feasible and are extremely effective measures in reducing nutrient runoff from pastures:

- Limited stabilized animal access
- Livestock exclusion from public waters through setback enforcement and fencing
- Creating alternate livestock watering systems
- Rotational grazing
- Vegetated buffer strips between grazing land and surface water bodies

The NFCRWD and local SWCDs will work with land owners to evaluate their pastures and install buffers and fencing where appropriate (Figure 5.2). The cost of installing exclusion fence and 30' wide native buffer is about $750 per 100 linear feet, plus the cost if necessary of a stabilized animal access point. Some or all of this cost may be eligible for funding from federal and state cost-sharing programs.

Estimated Cost: Staff time, $750 per 100 linear feet
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope County SWCD

5.1.4 Tile Intakes

Manure spreading across tile intakes allows direct access of manure and nutrient rich soil to surface waters. MN Rules Chapter 7020 requires a 25' setback from open tile intakes for spreading manure that is incorporated within 24 hours. A 300' setback from tile intakes is required for unincorporated manure. Buffering tile intakes and avoiding the spreading of manure near tile intakes can significantly reduce phosphorus loading from fields to surface waters. Tile intake buffer demonstration projects should be developed in the Rice Lake watershed. A tile intake buffer program should also be developed to buffer the majority of tile intakes in the watershed.

Estimated Cost: Staff time for education and enforcement
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope County SWCD

5.2 SOURCES ASSOCIATED WITH DEVELOPMENT

Another important component of the watershed load is development in the watershed. Most of the development in the direct watershed is either on the lake shore or associated with roads. In the North Fork Crow River watershed, moderate development may occur in or around the towns of Grove Lake, Padua, Brooten, Georgeville, Regal and Paynesville. Significant development is not slated in the Rice Lake watershed over the next 20 years. However, there are numerous practices available for reducing runoff and nutrient loads from impervious surfaces that can be developed into rules in ordinances to make sure development, when it does occur, will not degrade water quality.

One approach to protecting water quality and quantity is the development of rules aimed at minimizing the impacts of development. The purpose of the rules is to promote, preserve, improve, and enhance the environmental quality of the natural resources within the Rice Lake watershed without preventing reasonable use and development of land. The intent of the rules is to protect the quality of the watershed from adverse effects occasioned by poorly sited development or incompatible activities and regulating land disturbances or development activities that would have an adverse and potentially irreversible impact on the water quality and on fragile environmentally sensitive land within the watershed of Rice Lake.

***Estimated** Cost:* $5,000
Responsible Parties: NFCRWD, CROW, Stearns, Kandiyohi and Pope SWCDs

5.2.1 Increase Infiltration and Filtration in the Lakeshed

Encourage the use of rain gardens, native plantings, and reforestation as a means to increase infiltration and evapotranspiration and reduce runoff conveying pollutant loads to the lake. These practices are especially encouraged for lake shore owners. The cost of this strategy varies depending on the BMP and may range from $500 for a single property owner installing an individual rain garden to retrofitting parks and open space with native vegetation rather than mowed turf at a cost of $10,000.

Estimated Cost: $5,000 annually
Responsible Parties: Stearns, Kandiyohi and Pope SWCDs, NFCRWD, CROW

5.2.2 Shoreline Management and Restoration

Many property owners maintain a turfed edge to the shoreline (Figure 5.3). Property owners should be encouraged to restore their shoreline with native plants to reduce erosion and capture direct runoff. Shoreline restoration can cost $30-50 per linear foot, depending on the width of the buffer installed. Ideally about 75 percent of the residential shoreline would be native vegetation, with about 25 percent available for lake access. The NFCRWD and local SWCDs will work to develop some demonstration projects as well as work with all willing landowners to naturalize their shorelines.

Figure 5.3. Examples of shoreline areas on Rice Lake where shoreline restoration and lot-level best management practices can improve water quality.

Estimated Cost: $30-$50 per linear foot of restored shoreline
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope County SWCDs, Minnesota DNR, Rice Lake Association

5.3 WETLANDS

5.3.1 Evaluate and Prioritize Wetlands for Protection and Restoration

NFCRWD and local SWCDs should evaluate wetlands in the watershed to identify high priority wetlands for protection and restoration. Once these high priority wetlands are identified, management plans can be developed to maintain the functions and values of those wetlands. The cost of implementing wetland management is staff time from the watershed district and SWCDs.

Wetland modifications such as altering the hydrology of a priority wetland may eliminate phosphorus discharge and improve water quality. Other modifications such as buffering priority wetlands from farm fields and installing limestone berms can be used to improve phosphorus retention.

Estimated Cost: Staff time plus modification costs
Responsible Parties: NFCRWD, Stearns, Kandiyohi and Pope SWCDs

5.4 SEPTIC SYSTEMS

Septic systems in the Rice Lake watershed have received attention historically as a possible source of nutrients to the lake. In 2005, the NFCRWD established a $50,000 per year, 5-year ad velorum levy to fund a watershed-wide Septic Certification Project. A septic inspector was hired in 2006 to inspect all systems in the North Fork Crow River Watershed through a Joint Powers agreement between NFCRWD, Pope, Meeker, Kandiyohi and Stearns Counties. Systems that were found to be non-compliant were required to upgrade within 10 months of notice. Septics in the riparian zone of Rice Lake were considered priority and inspected first in 2007. All of these systems were in compliance and do not appear to be a significant nutrient source to the lake. Through 2010, there were approximately 400 systems left to be inspected. To-date inspection results are summarized below:

- Inspections Complete: 1,142
- Compliant Systems: 823 (72%)
- Non-Compliant Systems: 319 (28%)

Continuing efforts to identify and update all non-conforming septic systems in the watershed will be critical in determining their potential load to the North Fork Crow River and Rice Lake.

Estimated Cost: Funding secured
Responsible Parties: NFCRWD, Pope, Meeker, Kandiyohi and Stearns Counties

5.5 CONSTRUCTION STORMWATER ACTIVITIES

Construction stormwater activities are considered in compliance with provisions of the TMDL if they obtain a Construction General Permit under the NPDES program and properly select, install and maintain all BMPs required under the permit, including any applicable additional BMPs required in Appendix A of the Construction General Permit for discharges to impaired waters, or meet local construction stormwater requirements if they are more restrictive than requirements of the State General Permit.

Estimated Cost: MPCA Staff Time
Responsible Parties: MPCA

6.0 In-Lake Activities

6.1 REDUCE INTERNAL LOAD

Although internal loading is not the primary source of nutrients to Rice Lake, internal nutrient loads will need to be reduced to meet the TMDL allocations presented in the TMDL document. There are numerous options for reducing internal nutrient loads ranging from simple chemical inactivation of sediment phosphorus to complex infrastructure techniques including hypolimnetic aeration.

6.1.1 Internal Load Reduction Feasibility Study

Rice Lake Internal load laboratory analysis suggests basin L1 has significantly higher anoxic internal loading rates compared to the other three basins (Table 6.1). Nutrient and sediment loading from the North Fork Crow River is likely a major contributor to the high loading rates in this basin. It is important to point out, however, that internal load represents a larger proportion of the phosphorus budget in Rice Lake's deep basins (L2 and L4). Thus, a lake-wide feasibility study should be completed to evaluate the cost and feasibility of the lake management techniques available to reduce or eliminate internal loading in each lake basin. Several options should be considered to manage internal sources of nutrients including, chemical treatment such as alum, vegetation management and aeration.

Table 6.1. Nutrient release in Rice Lake.

Basin	Anoxic Release Rate ($mg/m^2/day$)	Ave Annual Internal Load (pounds)	Internal Load Percent of Total Nutrient Loading to Basin
L1	8.1	505	1%
L2	2.9	681	5%
L3	0.0	0	0%
L4	5.2	856	11%

Estimated Cost: $15,000 for internal load reduction feasibility study
Responsible Parties: NFCRWD, Rice Lake Association

6.1.2 Implement Recommendations of Feasibility Studies

Once the feasibility studies for internal load controls are completed and the preferred alternatives are identified, the selected technique needs to be implemented. The costs associated with each technique vary, however each technique requires some engineering as well as capital costs.

Estimated Cost: Approximately $1,000 per acre treated depending on results of feasibility study
Responsible Parties: NFCRWD, Stearns County SWCD, Rice Lake Association

6.2 OTHER PHYSICAL AND BIOLOGICAL STRATEGIES

Although controlling nutrients is a key component in restoring the beneficial uses to Rice Lake, other strategies need to be implemented to provide the necessary conditions in the lake to take full advantage of the nutrient reductions. These strategies are described below.

6.2.1 Implement Vegetation Management Plan

An aquatic vegetation management plan should be developed for Rice Lake. Implementation of a plan is an important step in meeting beneficial use goals in Rice Lake. Five goals which could be included in the plan are:

1. Control curlyleaf pondweed to affect water quality, restore native aquatic vegetation, improve recreational activities, and ensure continued tourism activities.
2. Provide aquatic plant identification and management information to property owners so informed decisions can be made.
3. Control nuisance aquatic plant conditions to provide improved recreational opportunities for lakeshore owners.
4. Establish stable funding for the management and restoration of aquatic plants and shoreline vegetation.
5. Improve the management of Rice lake shorelines supporting better water quality and enhancing the beauty of the lakes.

Estimated Cost: $5,000 for initial curlyleaf pondweed survey (includes early and late season survey); up to $20,000 annually for treatment if deemed necessary
Responsible Parties: Rice Lake Association, Minnesota DNR, NFCRWD

6.2.2 Manage Fish Populations

Maintaining a balanced fishery is an important aspect of any lake management plan. To accomplish this, the Minnesota DNR will monitor and manage the fish population to maintain a beneficial community. The Minnesota DNR already periodically monitors fish populations in Rice Lake.

Estimated Cost: Continuation of DNR fish surveys
Responsible Parties: Minnesota DNR

6.2.3 Rough Fish Assessment

Historical evidence suggests that a significant carp population exists in Rice Lake. However, fewer carp have been caught during the most recent fish surveys. It is important to note that current DNR fish assessment methods do not sample carp well to provide representative

population estimates. Commercial harvest of rough fish has occurred in past years, but none since 2001 when 9,150 pounds of carp were removed from the lake. Consequently, a special assessment needs to be conducted to evaluate current carp populations in Rice Lake and their migration and movement in and out of the lake. Monitoring should include both tagging and tracking carp in the watershed as well as mark and recapture assessments.

Estimated Cost: $20,000 for rough fish assessment
Responsible Parties: Minnesota DNR, NFCRWD, Rice Lake Association

6.2.4 Rough Fish Management Plan

Once the rough fish assessment has been completed, a watershed-wide management plan needs to be developed aimed at controlling the carp population in the watershed. A watershed-wide carp management plan would evaluate carp movement, spawning areas, and other critical habitat and prey relationships to identify management options for controlling carp reproduction. Targeted carp removal will likely be a component of any carp management plan (Figure 6.1).

Figure 6.1. Carp removal on Long Lake in the Rice Creek Watershed District (photo courtesy of Matt Kocian, RCWD).

Estimated Cost: Variable depending on management activities

Responsible Parties: Minnesota DNR, NFCRWD, Rice Lake Association

7.0 Summary and Costs

7.1 IMPLEMENTATION ACTIVITIES

Restoration of Rice Lake will require participation from all stakeholders, especially the land owners in the watershed and lake users. All of the activities identified in this plan will ultimately be the responsibility of the individual stakeholder. Many of the stakeholders ultimately responsible for implementing this plan also have numerous other responsibilities outside of Rice Lake. Because of these competing interests and needs, strong leadership will be needed to ensure that each of the stakeholders are accomplishing the tasks outlined in this plan to the best of their ability. The NFCRWD and Rice Lake Association will lead the implementation of this plan.

A summary of the activities outlined in this plan are provided in Table 7.1. Each of the activities is sorted by the source they address and the responsible stakeholders. Following is a brief description of the overall approach for each source or activity.

7.1.1 Education and Monitoring

Education and outreach is a critical part of the implementation process for Rice Lake. Education and outreach activities will focus on land owners, lakeshore owners, public officials and lake users. Education activities will focus on land management practices such as improved pasture management and lake shore management, recreational use impacts to lakes, nutrient management, and aquatic vegetation management. The purpose of the education and outreach component of the implementation plan will be to help stakeholders understand the TMDL and how their practices affect Rice Lake as well as provide outreach to public officials on the TMDL implementation plan.

The second piece of the education component of the implementation plan is the development of demonstration projects. Demonstration projects will focus on all aspects of improved land management including low impact development, shoreline management, turf management, and stormwater practices.

Monitoring is also a critical component of this TMDL since the implementation plan will occur using adaptive management. Adaptive management requires additional data to assess progress toward meeting the TMDL as well as potential course corrections based on the response of the water body. Water quality monitoring will occur for the North Fork Crow River and Rice Lake to evaluate changes in water quality over time.

Table 7.1. Implementation Activity by Stakeholder.

Actor	General Stormwater	CAFO/Pastures	SSTS	Woodlands/Wetlands	Internal Load
NFCRWD and Local County SWCDs	• Assess watershed impacts caused by development on receiving waters • Work with property owners to implement site level BMPs such as Low Impact Development (LID) practices especially where development is extremely close to the lake shore • Implement overlay district • Assess watershed impacts caused by development on receiving waters[1] • Work with property owners to implement site level BMPs such as Low Impact Development (LID) practices	• Pursue funding opportunities such as the Clean Water Legacy Act to provide funding for fencing programs and conservation easements • Promote a tour of conservation projects for Rice Lake watershed land owners • Implement Feed Lot Management Ordinance for feed lot expansions • Identify key pastures and wetlands for buffers and fencing • Work with land owners to obtain funding for buffer and fencing projects • Identify and implement demonstration projects for fencing and conservation easements in the Rice Lake watershed • Promote soil testing to help determine spreading rates for septage, animal waste and chemical fertilizers[1] • Provide technical assistance to land owners for manure and nutrient management[1] • Conduct a tour of conservation projects for Rice Lake watershed land owners	• Continue to assess all septic systems in the watershed • Work with landowners to upgrade all non-conforming systems • Provide low interest loans for land owners to upgrade noncompliant systems	• Work cooperatively with other agencies to protect high priority wetlands • Develop a management plan for high priority wetlands[1] • Work cooperatively with other agencies to protect high priority wetlands[1]	• Prepare feasibility reports and make recommendations on internal load strategies such as chemical treatment • Implement internal load reduction strategies
Property Owners	• Implement site level Low Impact Development practices	• Develop property nutrient and manure plans where applicable • Fence pastures where applicable • Implement buffers where applicable	• Inspect and maintain septic systems to required standards		
Rice Lake Association	• Promote implementation of development rules • Continue to gather Rice Lake Stakeholders through meetings and open houses • Promote implementation of site level Low Impact Development practices • Identify and develop demonstration sites for Low Impact Development practices		• Continue to work with NFCRWD and SWCDs to educate land owners on septic maintenance and compliance	• Work with the County to identify and protect high priority wetlands in the Rice Lake direct watershed • Implement conservation easements on high priority wetlands on lake shore lots	• Support NFCRWD and County SWCD in development of internal load feasibility report • Support NFCRWD and County SWCD in implementing internal load strategy
Minnesota DNR	• Provide technical assistance with stormwater BMPs including shoreline management	• Provide technical assistance for fencing and buffer projects	•	• Work cooperatively with other agencies to protect high priority wetlands • Provide technical assistance for wetland restoration	• Provide technical assistance for internal loading strategies

Actor	General Stormwater	CAFO/Pastures	SSTS	Woodlands/Wetlands	Internal Load
Minnesota Pollution Control Agency	• Provide technical assistance for stormwater management	• Implement CAFO program in the Rice Lake watershed • Provide technical assistance for fencing and buffer projects • Provide technical assistance for CAFO and manure management	• Provide technical assistance for SSTS programs	• Provide technical assistance for wetland restoration	• Provide technical assistance for internal loading strategies

Table 7.1, cont. Draft Implementation Activity by Stakeholder.

Actor	Aquatic Vegetation and Algae Control	Aquatic Recreation	Shorelines	Fisheries and Aquatic Life	Monitoring/ Reporting
NFCRWD and Local County SWCDs	• Assist in monitoring Rice Lake for exotic species	• Provide education on the potential impacts of boating on water quality	• Conduct a shoreline survey • Work with landowners to restore shorelines • Provide lakeshore revegetation assistance[1] • Promote lakeshore revegetation demonstration site on Rice Lake • Identify and implement additional lake shore restoration demonstration sites		• Collect implementation data from stakeholders annually • Monitor Rice Lake annually • Monitor North Fork Crow River inlet to Rice Lake for flow and water quality
Property Owners		• Minimize impacts by avoiding sensitive lake areas	• Restore shorelines		
Rice Lake Association	• Develop and implement aquatic vegetation management plan • Invasive species education • Work with the Minnesota DNR to control curly leaf pondweed to less than nuisance conditions	• Provide education on the potential impacts of boating on water quality	• Provide landowner education on shoreline restoration		
Minnesota DNR	• Work with Rice Lake Association to develop and implement aquatic vegetation management plan • Work with the Rice Lake Association to control invasive species such as curly leaf pondweed • Monitor vegetation every 3 years • Invasive species education	• Provide education on the potential impacts of boating on water quality	• Work with landowners to develop natural shorelines • Develop and provide education materials on shoreline restoration • Develop demonstration projects for shoreline restoration	• Monitor fish population every 5 years • Complete a special assessment to evaluate the rough fish population to determine potential water quality impacts from rough fish • Implement fisheries management plan	•

Actor	Aquatic Vegetation and Algae Control	Aquatic Recreation	Shorelines	Fisheries and Aquatic Life	Monitoring/ Reporting
Minnesota Pollution Control Agency					

7.1.2 Watershed Sources

Watershed nutrient sources to Rice Lake are primarily driven by animal agriculture in the watershed. Animal agricultural sources mostly revolve around manure management in the Rice lake watershed, so implementation focuses on manure management. Proposed practices include manure management plans and soil testing, buffers and fencing in pastures, and feedlot management to minimize the potential impacts of manure on surface waters.

Another potential source of nutrients that is currently being evaluated is septic systems in the watershed. As a part of the Septic Certification Project, each existing system will be identified and evaluated for performance. Failing septic systems can contribute nutrients to surface waters through tile lines, overland flow, and groundwater flow if too close to surface waters.

7.1.3 Internal Load and in-lake Management

Internal nutrient loading was identified as an important source to Rice Lake. Consequently, the source will need to be addressed to meet the state water quality standards. There are numerous techniques available to address internal loading including chemical inactivation, hypolimnetic aeration or withdrawal, and artificial circulation. These techniques will be evaluated in a feasibility study to identify the most cost-effective and appropriate approach.

Other in-lake management focuses on the biological conditions in Rice Lake including fish and aquatic vegetation. A rough fish population evaluation should be conducted on Rice Lake to identify whether carp are influencing water quality in the lake.

7.2 IMPLEMENTATION SEQUENCING

An important aspect of any implementation plan is the sequence in which activities are undertaken. Typically, watershed activities are the initial focus before any internal loading projects are completed to protect the long term benefits on any internal load reduction practice. Assuming that implementation of this management plan will require 15 years, Table 7.2 outlines the appropriate sequence for restoring Rice Lake.

Table 7.2. Rice Lake Restoration Sequence

Cycle	Ongoing Activities	Capital Projects and Studies
0-5 years	• Coordination and education • Water quality monitoring • Feedlot and pasture management • Manure management plans • Field P testing • Complete SSTS inspections • Develop aquatic vegetation management plan	• Demonstration projects • Fencing and buffers • Shoreline restoration • SSTS upgrades • Evaluate wetlands • Internal load feasibility study • Rough fish population assessment
5-10 years	• Coordination and education • Water quality and biological monitoring • Feedlot and pasture management • Manure management plans • Field P testing • Protect and restore wetlands • Implement aquatic vegetation management plan	• Fencing and buffers • Shoreline restoration • SSTS upgrades • Internal load reduction capital project • Rough fish management project (if necessary) • Wetland restorations
10-15 years	• Coordination and education • Water quality monitoring • Feedlot and pasture management • Manure management plans • Field P testing • Implement aquatic vegetation management plan	• Fencing and buffers • Shoreline restoration
15+ years	• Water quality monitoring • Implement aquatic vegetation management plan	• None

7.3 COST SUMMARY

Estimated costs for each of the program elements are provided in Table 7.3.

Table 7.3. Estimated costs associated with each implementation activity.

Program Element	Activity	Cost	Responsible Parties
Education	Coordination	5 hours/month	NFCRWD, Local County SWCDs, Rice Lake Association
	Recreation, Lakeshore and Land Management Impacts	$2,000 annually	NFCRWD, Local County SWCDs, Rice Lake Association
	Public Education and Outreach	$2,000 annually	NFCRWD, Local County SWCDs, CROW, Minnesota DNR, MPCA, Rice Lake Association
	Public Official and Staff Education	$2,000 annually	NFCRWD, Local County SWCDs, CROW, Minnesota DNR, MPCA, Rice Lake Association
	Demonstration Projects	$5,000 annually	NFCRWD, Local SWCDs, CROW, Rice Lake Association
Monitoring	Rice Lake Water Quality	$5,000	NFCRWD
	North Fork Crow River Flow and Water Quality	$5,000	NFCRWD, MPCA
	Vegetation Monitoring	$5,000	Rice Lake Association
	Fish Monitoring	$20,000	Minnesota DNR
Watershed Activities	Feedlot Management	Current Budget	NFCRWD, Local County SWCDs
	Buffers and Fencing Along Pastures	$750 per 100 linear feet	NFCRWD, Local County SWCDs
	Manure Management Plans	$20,000	NFCRWD, Local County SWCDs
	Tile Intakes	Staff Time	NFCRWD, Local County SWCDs
	Increase Infiltration in Watershed	$5,000 annually	NFCRWD, Local County SWCDs
	Shoreline Management and Restoration	$30-$50 per linear foot	NFCRWD, Local County SWCDs , Rice Lake Association
	Evaluate and Prioritize Wetlands	Staff time and modification costs	NFCRWD, Local County SWCDs , CROW
	Continue to Inspect Septic Systems in Rice Lake Watershed	Funding secured	NFCRWD, Local government and County SWCDs
	Upgrade Nonconforming Septic Systems	Variable	NFCRWD, Local County SWCDs , CROW
	Construction Stormwater	Current Program	MPCA

Table 7.3, cont. Estimated costs associated with each implementation activity.

Program Element	Activity	Cost	Responsible Parties
In-Lake Activities	Internal Load Reduction Feasibility Study	$15,000	NFCRWD, Local County SWCD
	Implement Internal Load Reduction and Biomanipulation Alternative	$1,000 per acre treated	NFCRWD, Local County SWCDs , CROW, Minnesota DNR, Rice Lake Association
	Implement Vegetation Management Plan	Up to $20,000 annually	Minnesota DNR, Rice Lake Association
	Rough Fish Assessment and Management	$20,000	Minnesota DNR, Rice Lake Association
Total Range			