

# **Nonpoint Source Control Plan for the Soft Maple and Hay Creek Priority Watershed Project**



This plan was prepared under the provisions of the Wisconsin Nonpoint Source Pollution Abatement Program by the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection, and the Russell County Land Conservation Department.

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**Nonpoint Source Control Plan for the  
Soft Maple and Hay Creek Priority Watershed Project**

**The Wisconsin Nonpoint Source Water Pollution Abatement Program**

May 1996

**This Plan Was Cooperatively Prepared By:**

The Rusk County Land Conservation Department  
The Wisconsin Department of Natural Resources and  
Wisconsin Department of Agriculture, Trade and Consumer Protection

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May 9, 1996

Bernice Dukerschein, Chair  
Rusk County Board of Supervisors  
311 East Miner Ave.  
Ladysmith, WI 54848

*Bernice*  
Dear Mrs. Dukerschein:

I am pleased to approve the Soft Maple and Hay Creek Priority Watershed Plan prepared through the Wisconsin Nonpoint Source Pollution Abatement Program. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR120, Wisconsin Administrative Code. This plan has been reviewed by the Department of Agriculture, Trade and Consumer Protection. The plan went before the Land and Water Conservation Board on April 2, 1996, and was unanimously approved at that time. I am also approving this plan as an amendment to the Upper Chippewa River Areawide Water Quality Management Plan.

I would like to express the Department's appreciation to the Rusk County Land Conservation staff that participated in preparing this plan. We look forward to assisting the Land Conservation Department and other units of government in the watershed in the implementation of the Soft Maple and Hay Creek Priority Watershed Plan.

Sincerely,

*George*  
George E. Meyer  
Secretary

cc: Alan Tracy, DATCP  
James Bradley, LWCB Chair  
Paula Carow, Rusk County LCD  
Jane Malischke, NWD  
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Phil Belfiori, WR/2

Quality Natural Resources Management  
Through Excellent Customer Service



ADOPTING THE SOFT MAPLE/HAY CREEK  
NONPOINT SOURCE PRIORITY WATERSHED PLAN

WHEREAS, the Soft Maple/Hay Creek Watershed was designated by the Department of Natural Resources in 1993 under the Wisconsin Nonpoint source Water Pollution Abatement Program, and

WHEREAS, this project compliments the goals of improved water quality in the Upper Chippewa River Basin, and

WHEREAS, the County Land & Water Conservation Department in cooperation with the Department of Natural Resources and the Department of Agriculture, Trade and Consumer Protection conducted a detailed inventory of the land use within the watershed in 1994 and 1995, and

WHEREAS, this inventory resulted in the development of a detailed nonpoint source control plan for the watershed, and

WHEREAS, a number of informational activities have occurred throughout the watershed, and an official public hearing was conducted on March 12, 1996, and

WHEREAS, the County wishing to receive cost sharing grants for landowners in the watershed must first adopt the Soft Maple/Hay Creek Watershed Plan.

NOW, THEREFORE BE IT RESOLVED, by the Board of Supervisors of the County of Rusk that the Soft Maple/Hay Creek Watershed Nonpoint Source Priority Watershed Plan be adopted and the implementation of the plan begin as soon as possible.

DATED: This 19th day of March, 1996.

Submitted by the Rusk County Land & Water Conservation Committee:

Alan Rath sack  
Alan Rath sack, Chairman

Dennis Severson  
Dennis Severson

Laurence Arts  
Laurence Arts

TO WHOM IT MAY CONCERN:

\_\_\_\_\_  
David Solsrud

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Margaret Ellmann

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Andrew Sisko

I, Melanie Meyer, County Clerk for Rusk County, Wisconsin, hereby certify that the foregoing is a true and correct copy of Resolution #96-13 adopted by the Rusk County Board of Supervisors on March 19, 1996.

Melanie Meyer  
Melanie Meyer, Rusk County Clerk

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# SUMMARY

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## Introduction

The Soft Maple and Hay Creek Priority Watershed Project plan assesses the nonpoint sources of pollution in the Soft Maple and Hay Creek Watershed and guides the implementation of nonpoint source control measures. These control measures are needed to meet specific water resource objectives for the streams, lakes and groundwater within the Soft Maple and Hay Creek Watershed. The primary objective of the project is to rehabilitate degraded streams and protect the high quality streams in the watershed.

Areas within the watershed in need of restoration are being affected by polluted runoff from barnyards, streambanks, roadway construction and maintenance, forest roads, and skid trails, cropland, and gullies. Protection of high quality water resources will be provided by development of a Rusk County Erosion Control Ordinance, which will be required within two years of plan approval. The project will also focus on forestry and roadway erosion control workshops and informational demonstrations targeting various stakeholder groups. By combining surface water restoration and protection management programs, the Soft Maple and Hay Creek Priority Watershed Project will attempt to address all relevant sources of nonpoint source pollution.

This plan was prepared by the Department of Natural Resources (DNR), the Department of Agriculture, Trade and Consumer Protection (DATCP), and the Rusk County Land Conservation Department (LCD). The DNR selected the Soft Maple and Hay Creek Watershed as a priority watershed project through the Wisconsin Nonpoint Source Water Pollution Abatement Program in 1993. It joined approximately 85 similar watershed projects statewide in which nonpoint source control measures are being planned and implemented. The Nonpoint Source Water Pollution Abatement Program was created in 1978 by the Wisconsin State Legislature. The program provides financial and technical assistance to landowners and local governments to reduce nonpoint source pollution.

The project is administered on the state level by the DNR and DATCP. The Rusk County LCD will administer the project on the local level with assistance from the University of Wisconsin Extension and the Natural Resource Conservation Service (U.S. Department of Agriculture). This plan is intended for use by DNR, DATCP, County LCD, local units of government, legislators, external program evaluators, and the interested public.

## General Characteristics

The Soft Maple and Hay Creek Watershed drains 175 square miles (112,000 acres) of land in Rusk County. The watershed is part of the Upper Chippewa River Basin. The Soft Maple and Hay Creek Watershed has been divided into 11 smaller drainage areas, called subwatersheds, for this planning effort (Map 2-1).

In the last ten years, the watershed population has declined by 5 percent, to approximately 2000 residents. Sixty percent of the watershed population lives in the incorporated areas of Weyerhauser and Bruce.

**Table S-1. Land Use in the Soft Maple and Hay Creek Watershed**

Land Use	Percent of Watershed
Pasture	25
Cropland	5
Woodlots	51
Developed	1
Wetlands, Lakes and Streams	18

## Water Resource Appraisal

The major water resource concern is the degradation of perennial streams by nonpoint source pollution. The decline of lakes, groundwater and wetland resources are a secondary concern. The water resource appraisal provided baseline data as to the current quality of water and the potential improvement for the watershed. These potential improvements are stated as general watershed goals as well as detailed subwatershed goals and overall management objectives.

### *Streams*

The surface water goals are to reduce suspended solids, phosphorus, and fecal coliform concentrations as well as to minimize water temperature increases. High phosphorus and fecal coliform levels were seen in areas of increased agriculture land use. High suspended solids levels tended to be located downstream of land disturbing activities such as trampled streambanks, roadway construction and maintenance, forest road erosion and expansion of landfill facilities. Water temperature increases were located within trampled streambank areas.

landfill facilities. Water temperature increases were located within trampled streambank areas.

### ***Fisheries***

The water resources appraisal portion of the Soft Maple and Hay Creeks Priority Watershed Project involved a fisheries survey and surface water monitoring process. A major component of the fishery survey analysis is the comparison of historic trout species habitat to present-day trout water. Several areas that historically supported trout species have been degraded. Since 1980, the watershed has had a 25 percent reduction of stream miles classified as a cold water fishery (from 52 to 38 stream miles). The lower portion of Becky Creek and upper and lower portions of Soft Maple Creek have strong potential for being upgraded in trout fishery classification.

### ***Lakes***

Ten of the thirteen lakes in the watershed were monitored for water quality parameters. The overall watershed objective for lakes is to reduce phosphorus loading by 50 percent. The lake of highest concern is Amacoy Lake in the southern portion of the watershed. The Lake's water quality and fish production is degraded by nutrient inputs from cropland runoff in the Amacoy Lake Subwatershed.

### ***Groundwater***

An inventory of groundwater quality was completed by sampling private wells for nitrate-nitrate. Nitrate levels greater than 2 mg/L preventive action limit (PAL) may indicate that human activities are affecting groundwater quality. Results show that 13 percent of the well samples collected had nitrate levels over the enforcement standard (health advisory level) of 10 milligrams per liter (mg/L), and 37 percent had nitrate levels between 2 mg/L and 10 mg/L, the PAL.

### ***Wetlands***

Wetlands and other water resources make up 18 percent of the land area in the watershed. The wetland areas are primarily located within the Chippewa River floodplain and in the Hay Creek subwatershed. The most prevalent wetlands are in forested areas. Wetlands have a positive water quality impact to trap suspended solids and nutrients prior to delivery to streams in the Hay Creek Subwatershed. Wetland restoration for water retention is a high priority in the Alder Creek Subwatershed.

## **Sources of Water Pollution**

The Rusk County LCD collected land use inventory data on croplands (20 percent), barnyards, roadways and streambanks in the watershed. This data was used to estimate the pollutant stream delivery rates of these nonpoint sources. The amount of Chemical Oxygen Demand (COD) carried in runoff from each barnyard to a receiving stream was calculated. The amount of sediment reaching streams from eroding agricultural lands, streambanks and roadways was also determined.

### ***Rural Inventory Results***

#### **Barnyard Runoff Inventory Results**

- 110 barnyards were assessed.
- These barnyards were found to contribute 330,000 pounds of COD annually to streams.

#### **Streambank Erosion Inventory Results**

- 91 stream miles were inventoried.
- 985 tons/ year of sediment reach streams from eroding sites.
- There are 5.9 miles of eroding sites (6.5 percent of streambanks inventoried).

#### **Roadway Erosion Inventory Results**

- 248 tons/ year of sediment reach stream from roadway erosion.

#### **Upland Sediment Inventory Results**

- 8044 tons/ year of sediment are delivered to streams from cropland in the entire watershed.

## **Pollutant Reduction Objectives**

### ***Sediment Reduction Objective***

Reduce overall sediment delivered from sheet and rill erosion, streambank erosion, trampled streambanks, and roadways forest road erosion. To meet the objective, the following is needed:

- 22 percent reduction in sediment reaching streams from agricultural uplands in all subwatersheds.

- 75 percent or 7.4 miles of rehabilitation of degraded streambank habitat (trampled) in all subwatersheds.
- 100 percent reduction in feet of trampled streambank in the Becky Creek Subwatershed.
- 30 percent reduction in streambank sediment delivered to all streams from untrampled sites.
- 10 percent reduction in streambank sediment delivered to all streams from site with limited accessibility for construction of BMPs.
- 50 percent reduction in sediment delivery from forestry erosion sites.
- Reduce sediment delivery from roadway maintenance and construction.

### ***Chemical Oxygen Demand (COD) Reduction Objective***

Reduce overall COD load by 50 percent. To meet this goal, the following is needed:

- 50 percent reduction in organic pollutants from barnyards in all subwatersheds.
- Achieve the sediment goal described above; reduction of sediment delivery will reduce COD because organics are tied to sediment.

### **Specific Critical Site and Eligibility Criteria**

#### ***Animal Lots***

Of the 110 barnyards in the watershed, 57 are eligible for some level of cost share assistance, five are presently exceeding criteria making them critical sites. Barnyards in high reduction subwatersheds are eligible for full runoff control systems if they contribute greater than 3000 pounds COD annually. Barnyards in medium reduction subwatersheds are eligible for full runoff control systems if they contribute greater than 7000 pounds COD annually. All barnyards contributing greater than 1000 pounds COD annually are eligible for clean water diversions. Overall, there are 31 barnyards eligible for cost-sharing for full system barnyards and an additional 26 eligible for clean water diversion barnyard systems.

#### ***Trampled Streambanks***

All trampled streambank sites are eligible for cost-sharing. The three trampled streambank sites in the Becky Creek subwatershed will be designated as critical sites. Trampled streambank sites designated as critical are required to install Best Management Practices

(BMPs) to improve streambank habitat and control cattle access and bank pasturing. Over nine miles of streambank in the watershed are degraded and are eligible for fencing.

### ***Eroding Streambanks***

There is an emphasis on controlling bank erosion and improving fish and wildlife habitat in all subwatersheds, to enhance water quality and recreational opportunities.

Untrampled eroding streambanks are eligible if BMP control costs are less than \$45.00 per ton of soil saved over 10 years. Limited accessibility streambanks with natural erosion are eligible if BMP control costs are less than \$50.00 per ton of soil saved over 10 years. There is over 665 tons of sediment being delivered from eligible streambanks in the watershed.

### ***Gravel Roads Erosion Control***

A major objectives of this plan is to develop a system for management of gravel road erosion through the education of township road crews on water quality BMPs. Unlike upland sources which are principally fine-sized materials, the coarse sediment from these sites contributes significantly to water quality. The Rusk County Construction Site Erosion Ordinance (required within two years of plan approval) will consist of standards for the maintenance and construction of roadway erosion control. An erosion control workshop was held on March 12, 1996 to assist highway staff with design methods. An inventory conducted by county staff indicated that approximately 248 tons/year of sediment are being delivered from roadway ditching and grading activities.

### ***Forestry Erosion Control***

Stream headwater areas are affected by sediment delivered from forest road and skid trails. The project will focus on two management groups for control of forestry erosion: closed forest roads and planned roads. BMPs will be applied as listed in Chapter 6 of "Forest Roads" in DNR publication FR-093-95, Wisconsin Forestry Best Management Practices For Water Quality, developed by DNR Bureau of Forestry. Where forest roads are closed, BMPs to reduce sediment delivery to streams, lakes and wetlands are eligible for cost-sharing funds. Sites are eligible if they do not exceed cost control criteria of \$40.00 per ton control over the ten year life of the project. For planned timber harvest on County forest land, the Rusk County Forestry Department, with assistance from Rusk County LCD, will work with loggers to use forestry BMPs. An informational workshop was held in Spring 1996 to inform loggers of Forestry BMPs.

### ***Nutrient Management and Manure Storage***

All operations which receive cost-sharing for barnyards or manure storage facilities will be required to participate in nutrient management planning. Eligibility for cost-sharing for

manure storage practices will be based on the Nutrient Management Plan developed in compliance with NRCS standard 590 prior to signing of cost-share agreements (see Nutrient Management and Manure Storage sections in Chapter Two of the watershed plan).

### ***Croplands***

All agricultural lands contributing sediment to streams at a rate greater than 0.3 tons per acre per year will be classified as eligible for cost sharing. Eligible fields include approximately 5,684 acres of cropland in the watershed, or approximately 5 percent of total land area (including non-agricultural) in the watershed. Additional sediment delivery reduction may be provided through riparian buffers. There will not be critical sites designation for upland fields due to the already limited amount of erosion caused by cropland. No fields were identified with extreme sediment delivery problems.

**Table S-2. Summary of Critical Sites**

CRITICAL SITE LAND USE	NUMBER /UNITS
Trampled Streambanks	3 sites - (13,700 feet of fencing)
Barnyards	5

### **Funds Needed for Cost Sharing, Staffing, and Educational Activities**

The DNR will award grants to the Rusk County Land Conservation Department for cost sharing, staff support and educational activities and other support. Table S-3 on the next page includes cost estimates assuming 75 percent participation rate of eligible landowners.

**Table S-3. Cost Estimates for the Soft Maple and Hay Creek Priority Watershed Project**

<b>Item</b>	<b>State Share of Costs (75% Participation)</b>
Cost-Share Funds: Practices	\$1,272,365
Cost-Share Funds: Easements	\$50,000
Local Assistance Staff Support	\$866,765
Information/Education Direct	\$16,395
Other Direct (travel, supplies, etc.)	\$134,249
Engineering Assistance	\$1,320
Total	2,341,094



## **Project Implementation**

Project implementation is scheduled to begin in Summer 1996 and end in 2006. Participating landowners may sign cost-share agreements at any time throughout the 5 year watershed implementation sign-up phase. BMPs can usually be installed soon after a landowner signs a cost-share agreement with the Rusk County LCD.

Landowners having critical sites will be notified of their critical site designation during the first 6 to 15 months of the implementation period. The Rusk County LCD will field verify critical sites before critical site notification letters are sent by the DNR.

## **Information and Education**

The Rusk County LCD will have overall responsibility for conducting an information and education program during the project. University of Wisconsin-Extension (UWEX) staff will provide assistance. This program will be most intense during the first four years of the project (1996 - 2000). The activities include BMP demonstrations, fact sheets, news releases, school group activities, presentations, one-on-one contacts, forestry and roadway workshops, watershed tours, watershed newsletters and public informational meetings.

### ***Information and Education Program Goal***

Residents of the watershed will make decisions and take actions that protect surface and groundwater quality in the Soft Maple/Hay Creek Watershed.

### ***Program Objectives***

- 1) Watershed residents will come to understand the value of surface and groundwater resources and how to preserve them.
- 2) Agricultural producers will minimize nutrient, sediment, and other runoff pollutants from farming activities.
- 3) Forest product producers will reduce nutrient, sediment, and other runoff pollutants from forestry activities.
- 4) Shoreland residents will reduce phosphorus, sediment, and other runoff pollutants from lakeshore property.
- 5) Village residents will reduce phosphorus, sediment, and other runoff pollutants to stormwater systems.

- 6) Landowners will protect and, where possible, restore wetlands.
- 7) Local government officials will make decisions that protect water quality.

## **Project Evaluation and Monitoring**

The evaluation strategy for the project involves collecting, analyzing and reporting information to track progress in three areas:

**I. Administrative:** This category includes the progress in providing technical and financial assistance to eligible landowners, and carrying out education activities identified in the plan. The Rusk County LCD tracks the progress in this area and reports to the DNR and DATCP annually.

**II. Pollutant Reduction Levels:** The Rusk County LCD will calculate the reductions in nonpoint source pollutant loading resulting from changes in land use practices and report to the DNR and DATCP at an annual review meeting.

**II. Water Resources:** The DNR monitors changes in water quality, habitat, and water resource characteristics periodically during the project and will be a component of the final report at the end of the project period

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# **CHAPTER ONE**

## **Purpose, Legal Status and General Description**

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### **Wisconsin Nonpoint Source Water Pollution Abatement Program**

The State Legislature created the Wisconsin Nonpoint Source Water Pollution Abatement Program in 1978. The goal of the Program is to improve and protect the water quality of streams, lakes, wetlands, and groundwater by reducing pollutants from nonpoint sources. The 175 square-mile Soft Maple and Hay Creek Priority Watershed, located in Rusk County, was designated a "priority watershed" in October 1993. The primary objective of this project is to enhance and protect the water quality of the streams and lakes in the Soft Maple and Hay Creek Priority Watershed.

Nonpoint sources of pollution include: eroding agricultural lands, eroding streambanks and roadsides, runoff from livestock wastes, and erosion from forestry practices. Pollutants from nonpoint sources are carried to the surface water or groundwater through rainfall runoff or seepage, and snowmelt.

The following is an overview of the Nonpoint Source (NPS) program:

- The DNR and DATCP administer the program. It focuses on critical hydrologic units called priority watersheds. The program is implemented through priority watershed projects.
- A priority watershed project is guided by a plan prepared cooperatively by the local units of governments, DNR, and DATCP with input from a local citizen's advisory committee. Project staff evaluate the conditions of surface water and groundwater, and inventory the types of land use and nonpoint sources of pollution throughout the watershed. The priority watershed plan assesses nonpoint and other sources of water pollution and identifies BMPs needed to control pollutants to meet specific water resource objectives. The plan guides implementation of these practices in an effort to improve water quality.
- Upon approval by local authorities and state, local units of government implement the plan. Water quality improvement is achieved primarily through voluntary implementation

of nonpoint source controls (BMPs) and the adoption of ordinances. Landowners, land renters, counties, cities, villages, towns, sanitary districts, lake districts, and regional planning commissions are eligible to participate.

- Technical assistance is provided to aid in the design of BMPs. State level cost-share assistance is available to help offset the cost of installing these practices. Eligible landowners and local units of government are contacted by the County LCDs to determine their interest in voluntarily installing the BMPs identified in the plan. Landowners with sites meeting the criteria for critical sites are required to achieve the pollution reduction goal for their site through the installation of BMPs or elimination of the source. Signed cost-share agreements list the practices, costs, cost-share amounts and a schedule to install management practices.
- Informational and educational activities are developed to encourage participation and assist with adoption of BMPs.
- The DNR and DATCP review the progress of the counties and other implementing units of government, and provide assistance throughout the eight to ten year project. The DNR monitors improvements in water quality resulting from control of nonpoint sources in the watershed.

### **Legal Status of the Nonpoint Source Control Plan**

The Soft Maple and Hay Creek Priority Watershed Plan was prepared under the authority of the Wisconsin Nonpoint Source Water Pollution Abatement Program described in Section 144.25 of the Wisconsin Statutes and Chapter NR 120 of the Wisconsin Administrative Code. It was prepared through the cooperative efforts of the DNR, DATCP, and the Rusk County LCD.

This watershed plan is the basis for the DNR to enter into cost-share and local assistance grants with agencies responsible for project implementation and is used as a guide to implement measures to achieve desired water quality conditions. If a discrepancy occurs between this plan and the statutes or the administrative rules, or if statutes or rules change during implementation, the statutes and rules will supersede the plan. Similarly, this plan is subject to the amendment process under NR 120.08(4) for substantive changes. The DNR will make determination if a proposed change will require a plan amendment. This watershed plan does not in any way preclude the use by local, state or federal governments of normal regulatory procedures developed to protect the environment. All local, state and federal permit procedures must be followed. In addition, this plan does not preclude the DNR from using its authority under Chapters 147 and 144 of the state statutes to regulate significant nonpoint pollution sources in the project area.

## **Amendment to the Plan**

This plan is subject to the amendment process under s. NR 120.08(4) for substantive changes. The Department of Natural Resources will make the determination with the local sponsors if a proposed change will require a formal plan amendment.

## **Relationship of the Nonpoint Source Control Plan to the Stormwater Discharge Permit Program**

Wisconsin's WPDES Storm Water Permit Program is administered by DNR's Bureau of Watershed Management under Chapter 147 of the Wisconsin Statutes. This program is entirely separate from the Nonpoint Source program and applies to certain classes of dischargers statewide as identified in proposed ch. NR 216. In cases where the programs do overlap, grants for planning activities associated with preparing the priority watershed plan are not affected, but implementation grants may only apply to activities identified in the plan. Practices to control construction site erosion and storm water runoff from new development are not eligible for cost sharing. Generally speaking, industrial areas contaminated by the industrial process are not eligible for assistance. Cost sharing is available as specified in s. NR 120.10 (1)(g) only in the non-industrial part of a facility where a problem has also been identified in the plan.

## **Project Planning and Implementation Phases**

### ***Planning Phase***

The planning phase of the Soft Maple and Hay Creek Priority Watershed Project began in January 1994. The planning phase included steps to:

1. Determine the conditions and uses of streams, and lakes, fisheries, wetlands and groundwater.
2. Inventory types of land uses and severity of nonpoint sources affecting groundwater, streams and lakes.
3. Evaluate the types and severity of other factors which may be affecting water quality. Examples include discharges from municipal wastewater treatment plants and natural or endemic stream conditions. (This has been completed through the ongoing integrated resource management planning efforts in the Upper Chippewa River Basin.)
4. Determine nonpoint source controls and other measures necessary to improve and/or protect water quality.

5. Assess educational needs and begin implementation of an educational strategy.
6. Prepare and gain approval of a program for local implementation of the project so that plan recommendations can be carried out.

### ***Implementation Phase***

The implementation phase of the Soft Maple and Hay Creek Priority Watershed Project began following review of the draft priority watershed plan, a public hearing, and approval by the Board of Supervisors for Rusk County, DNR, DATCP and the Land and Water Conservation Board. Public review during plan development occurred primarily through the efforts of the Soft Maple and Hay Creek Watershed Citizen Advisory Committee.

During the implementation phase:

1. DNR enters into local assistance agreements with local units of government that have implementation responsibilities identified in the plan. These agreements provide funds necessary to maintain the resources and staff required for plan implementation.
2. In the rural portions of the watershed, the Rusk County LCD will contact eligible landowners to determine their interest in voluntarily installing best management practices identified in the plan.
3. In rural areas, the landowner signs a cost-share agreement with the county that outlines the practices, costs, cost-share amounts and a schedule for installation of management practices. Practices are scheduled for installation up to five years from the date an agreement is signed. Practices must be maintained for at least 10 years. Easements purchased through the Nonpoint Source Program must be for a period of at least 20 years, and in many cases will be perpetual.
4. Where sites were designated as Critical Sites in the Soft Maple and Hay Creek Priority Watershed Plan, landowner will have 36 months from date of notification to sign a cost-share agreement. If after five years, project goals have not been met according to the project team, Critical Sites criteria may be amended.

## **Location and Community Information**

The Soft Maple and Hay Creek Priority Watershed is a 175-square-mile drainage basin located approximately 60 miles north-northeast of Eau Claire in northwestern Wisconsin (map 2-1). The streams in the watershed drain into a 23-mile portion of the Chippewa River and are located within the Upper Chippewa River Basin.

Several streams in the Soft Maple and Hay Creek Priority Watershed provide excellent cold water trout fisheries. Alder, Becky, Clear, Devils, and Little Soft Maple Creeks are cold water streams which flow out of the Blue Hills in the Northwest portion of the watershed. Soft Maple Creek has a variety of use classifications throughout the 25 mile length. There are also 14 lakes in the watershed, several with sport fish populations. The Amacoy Lake Association provides an important local voice for the project and has been instrumental in installation of barnyard demonstration practices. Together, the restoration and preservation of these streams and lakes are the focal point of this watershed plan.

### ***Civil Divisions***

The Soft Maple and Hay Creek Priority Watershed lies entirely within Rusk County. Incorporated areas in the watershed include the Villages of Bruce and Weyerhauser. There are also several townships within the watershed boundaries, including Wilkinson, Atlanta, Murry, Thornapple, Stubbs, Big Bend, Washington and Strickland. The main public land within the watershed is the Rusk County Forest in the Blue Hills region in the northwest portion of the watershed.

### ***Population Size and Distribution***

The Soft Maple and Hay Creek Priority Watershed population is estimated to be about 2000 persons. Sixty percent of the watershed population lives in the Villages of Bruce and Weyerhauser. Population in the watershed is declining. All townships and villages have had population decline of 5 percent over the past decade. Regional trends suggest that the watershed's population will stabilize.

### ***Land Uses***

Rural forest land is predominant in the watershed. Woodlots comprise 51 percent of the project area with timber harvesting being the most prevalent land use. Developed agricultural land occupies less than 31 percent of the watershed (Table 1-1). Dairy farming is the primary agricultural land use, with the average farm size being approximately 160 acres.

**Table 1-1. Summary of Land Uses in the Soft Maple and Hay Creek Priority Watershed**

Land Uses	Acres	Percent
Agricultural - Pasture	27,102	25 %
Cropland	5,421	5 %
Woodlots	57,087	51 %
Developed	1,908	1 %
Wetland	18,453	18 %

### ***Agriculture***

Agriculture land (pasture and cropland) comprises less than 31 percent of the land in the watershed. Dairy farming is the primary agricultural land use with the average farm size being 160 acres. The average herd size for the watershed is estimated at 44 head. Cropland comprises less than 20 percent of the total agricultural land area. The predominant crops in the watershed are hay and corn for silage.

### ***Forestry***

Forestry makes up 51 percent of the land area in the Soft Maple and Hay Creek Watershed. The largest concentration of forest area in the watershed is in the Blue Hills - Rusk County Forest in the northwest portion of the watershed. The more than 100 miles of logging roads and skid trails in the Blue Hills provide a substantial forestry transportation network located in the headwaters of several streams.

### ***Gravel Roads - Construction and Maintenance***

There are an estimated 200 miles of gravel roads in the watershed. Erosion from unpaved highway right-of-ways and road construction areas deliver a considerable amount of sediment to the streams in the Soft Maple and Hay Creek Watershed. The sediment deposited through roadway construction and maintenance increases the obstruction of critical trout spawning habitat in the headwaters of streams.



## **Pollution Sources**

Many pollution sources contributing to surface water quality degradation in this watershed are typically not addressed by the traditional priority watershed projects. Control of these sources occurs through other state and county regulatory programs, as described below.

### **Wastewater Treatment Systems**

Discharge of wastewater from permitted municipal and industrial sources are important considerations for improving and protecting surface water resources. Chapter 147, Wis. Stats., requires any person discharging pollutants into the waters of the state to obtain a Wisconsin Pollution Discharge Elimination System (WPDES) Permit issued by the DNR.

### **Industrial Wastewater Treatment Plants**

Mid-America Dairymen, Inc. is the only industrial wastewater discharge in the watershed. The facility is located in Bruce and uses a ridge and furrow system for treatment and disposal of its wastewater. The plant in Bruce discharges wastewater to the groundwater through seepage cells.

### **Sewage Treatment Systems**

Sanitary sewer service is available in incorporated communities. Approximately 1200 persons, over 60 percent of the watershed population, receive service. Wastewater generated by the remainder of the watershed residents is disposed of through private on-site systems.

### ***Municipal Waste Water Treatment Plants***

The villages of Bruce and Weyerhauser have municipal wastewater treatment plants that discharge to surface water.

*Village of Bruce Wastewater Treatment Plant:* The Village of Bruce WWTP discharges to the Chippewa River. The capacity of the plant is 196 thousand gallons per day. The average daily intake of the plant is 30 to 40 thousand gallons per day. Treatment of wastewater is through a stabilization pond system, built in 1983. The system was designed to serve a population of 980 people by 2003.

*Village of Weyerhauser Wastewater Treatment Plant:* The Village of Weyerhauser discharges to the Little Soft Maple Creek. The treatment system was upgraded in 1971 and is operating well within its design capacity. The system uses an activated sludge-extended aeration treatment system. The system was designed to serve 200 people in 1991.

### ***Private Sewage Systems***

A typical septic system consists of a septic tank and a soil absorption field. Septic systems fail due to soil type, location of system, poor design or maintenance such as tanks which go unemptied. Pollutants from septic system discharges are nitrates, bacteria, viruses and hazardous materials from household products. Generally, in the Soft Maple and Hay Creek Watershed, most of soils are not suitable for conventional septic tank soil absorption systems. The dense glacial tills associated with the Almena-Auburndale soils of the watershed do not accept enough moisture for an effective absorption system. As a result, there is surface discharge where soil absorption systems have failed. This presents a surface water quality problem.

The Wisconsin Fund is a Private Sewage System Replacement Grant Program offering financial assistance to eligible homeowners and small business operators to help offset the costs of replacing a failing septic system. Counties have been able to use the Wisconsin Fund since 1981. The program is administered by the County's Zoning Department. The grant program applies to principal residences and small businesses built prior to July 1, 1978, and is subject to income and size restrictions. Seasonal homes are not eligible for participation in this program. Interested individuals should contact Rusk County zoning department for more information.

### **Land Application of Municipal and Industrial Wastes**

Sludge is an organic, non-sterile, by-product of treated wastewater, composed mostly of water (up to 99 percent). The re-use of sludge through land application is considered a beneficial recycling of nutrients and is a valuable soil conditioner. Use of sludge in this manner is also considered to be the most cost-effective means for the treatment facility to dispose of the material.

Land application of municipal and industrial sludge is regulated under chs. NR 204 and NR 214 respectively. Sludge land disposal requires a WPDES permit, site criteria, minimum distances from wells, application rates, proper soil types, depth to groundwater, distance from surface water, and the type of crop to be grown on sludge applied fields are factors taken into consideration when the DNR approves agricultural fields for sludge application.

## **Solid Waste Disposal Sites- Timberline Trail Landfill**

### ***Site History***

Timberline Trail Landfill is located in Atlanta Township, (Township 34N - Range 8W, Section 4) is owned and operated by Waste Management Incorporated and located near the Village of Weyerhauser in the Town of Stubbs. It is a recently constructed landfill. Runoff from the landfill is captured in one sedimentation basin. Because the runoff contains fine clay which does not settle out, the runoff is then routed to another sedimentation basin where a flocculent is added. The clean water is spray irrigated at a rate of 1/2 inch per acre.

During construction of the landfill in June of 1994, a temporary dike to hold runoff was breached. Runoff containing an unknown amount of suspended solids was washed into Hay Creek. The DNR required Waste Management Inc. to analyze the creek to determine the effect of the breach. Some sedimentation was found downstream and several minnow species were eliminated. Although 16-17 inches of silt were found in some areas, it was concluded that no permanent damage was done to the stream. It was determined by the DNR Bureau of Waste Management that the Plan of Operation for construction had been violated, but after the study the case was closed.

Another violation occurred on October 10, 1995. The landfill's irrigation equipment was not working, allowing clean water to run out the end of the pipe. A heavy rain and subsequent runoff entered an intermittent stream which drains to Hay Creek and Devils Creek. The impact from this violation in the summer/fall of 1995 was estimated by landfill management and DNR staff to have delivered 2.5 - 4.5 million gallons of water. This spill was documented by aerial photos but it is hard to quantify. Waste Management Inc. has received a notice of violation and will be fined.

### ***Management Action***

As a consequence of the most recent violation, Waste Management Inc. may contribute money into the Soft Maple and Hay Creek Watershed Project rather than pay a fine to DNR (See Chapter Four, Project Integrated Resource Management for details). There will also be some monitoring of total dissolved solids at the landfill and limits on total dissolved solids will be established.

### ***Sediment Delivery from Landfill***

The Timberline Trail Landfill has been designated as a critical area for sediment delivery in the Watershed. The watershed appraisal and fisheries report have documented the negative impact of sediment on biological and fishery habitat. Hay Creek will continue to be monitored to assure that landfill runoff is not impacting the stream.

### ***Petroleum Storage: Leaking Underground Storage Tank (LUST) Sites***

The Wisconsin Remedial Response Site Evaluation Report (DNR publication number SW-144-91) lists the sites identified through the LUST program. There are seven sites listed within the watershed. (The present phase of clean up in a state-funded investigation is to determine who the potentially responsible parties are.)

### ***Waste Disposal Sites***

Sites listed as Waste Disposal Sites are from the DNR's "Registry of Waste Disposal Sites in Wisconsin" (June, 1993) which lists known solid and hazardous waste disposal sites. The list includes both active, inactive and abandoned sites. Inclusion on the list does not mean that environmental contamination has occurred, is occurring, or will occur in the future. The registry is a source of general information as to the location of waste disposal sites in Wisconsin. There are nine sites listed in the registry which are located in the Soft Maple and Hay Creek Watershed; these are listed below:

<u>Site Name</u>	<u>Location</u>
TN of Strickland	Strickland
Adams Brothers	Stubbs
Precision Wood Products	Stubbs
TN Stubbs-District 5 Landfill	Stubbs
Village of Weyerhauser	Stubbs
North Woods Disposal	Thornapple
Village of Bruce	Village of Bruce
Monty Gordon	Wilkinson
TN of Wilkinson	Wilkinson

### ***Other Contaminated Sites***

A current listing by the Bureau of Waste Management (December, 1995) lists 43 spill sites near or in the Soft Maple and Hay Creek Watershed. Thirty-four of these are located near Ladysmith, five near Bruce and four near Weyerhauser. The database had limited information on spill locations and no current information on substances spilled or site status. This information will become available in March of 1996. There are no Superfund sites in the Soft Maple and Hay Creek Watershed.

### ***Mining***

Although there is presently no mining activity within the Soft Maple and Hay Creek Watershed project, there are sites close by which may induce other mining companies to move to the area. Mining will not be addressed by the Watershed plan at this time, but will be dealt with if the need arises.

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## **CHAPTER TWO**

# **Watershed Conditions, Program Goals and Eligibility Criteria**

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This chapter discusses the physical characteristics, existing water resource conditions, goals and management categories for the water and land resources in the Soft Maple and Hay Creek Priority Watershed. Information is presented for specific water resource conditions, pollution sources and for each subwatershed.

### **Physical Setting**

#### **Watershed Characteristics**

##### ***Climate and Precipitation***

The frequency, duration and amount of precipitation influences surface and groundwater quality and quantity, soil moisture content, runoff characteristics, and the physical condition of waterways. The Soft Maple and Hay Creek Watershed lies in the continental zone which is characterized by winters which are long and relatively cold and snowy. Summers are mostly warm with periods of hot, humid conditions. Mean annual precipitation for the region is about 30.7 inches of rain and melted snow; the majority falls in the form of thunderstorms during the growing season (May-September). Most runoff occurs in February, March, and April when the land surface is frozen, soil moisture is high, and plant uptake is minimal.

##### ***Topography***

The majority of the Soft Maple and Hay Creek Priority Watershed has a relief that is primarily the result of glacial activity. Landforms generally associated with this area include outwash plains, collapsed outwash plains, outwash fans, outwash terraces, and moraines. The topography ranges from nearly level to rolling. The northwestern part of the priority watershed, the Blue Hills, are underlaid by quartzite bedrock. This region has topography that ranges from undulating to very steep.

## *Geology*

The Soft Maple and Hay Creek Priority Watershed is mostly underlain with sandstone and metavolcanic rock at depths greater than 15 meters. The Blue Hills area in the northwest is underlain with Barron Quartzite which is exposed in places. Throughout the priority watershed the overlying deposits include glacial outwash, glacial till and loess. These deposits are the result of glacial activity from the Chippewa Lobe which flowed into the area prior to 25,000 years ago and influenced the area until about 9,500 years ago.

## *Soils*

The soils of the Soft Maple and Hay Creek Priority Watershed include four major associations.

### Antigo-Padus-Sconsin-Ossmer Association

The central and northeastern part is dominated by the Antigo-Padus-Sconsin-Ossmer association. The well drained Antigo, moderately well drained Sconsin, and somewhat poorly drained Ossmer consists of very deep soils formed in 12-40 inches of silty deposits over sandy and gravelly outwash. The well drained Padus consists of very deep soil formed in 24-40 inches of loamy deposits over sandy and gravelly outwash. Permeability is moderate in the silty and loamy mantle and rapid to very rapid in the outwash. Surface runoff is slow to very rapid on Antigo and Padus soils, slow to moderate on Sconsin soils, and slow on Ossmer soils. These soils are primarily on outwash plains, outwash fans, and outwash terraces. Organic and mineral wetlands soils are common throughout this association.

### Vilas-Pence-Croswell-Manitowish Association

The southern part is dominated by the Vilas-Pence-Croswell-Manitowish association. The excessively drained Vilas and moderately well drained Croswell consists of very deep soils formed in sandy outwash. The well drained Pence and moderately well drained Manitowish consists of very deep soils formed in 10-20 inches of loamy deposits over sandy and gravelly outwash. Permeability is moderately rapid to rapid. Surface runoff is very slow to rapid on Vilas and Pence soils and very slow to slow on Croswell and Manitowish soils. These soils are primarily on outwash plains, collapsed outwash plains and outwash terraces. Organic and mineral wetland soils are common throughout this association.

### Newot-Newood Association

The southwestern part, which represents the smallest area, is dominated by the Newot-Newood association. The well drained Newot and moderately drained Newood consists of deep and very deep soils formed in loamy deposits over dense loamy glacial till. Permeability is moderate to slow in the loamy mantle and very slow in the dense till. Surface

runoff is rapid on Newot soils and slow to moderate on Newood soils. These soils are on the end moraine of the Chippewa Lobe. Organic and mineral wetland soils are common throughout this association.

#### Ribhill-Magnor Association

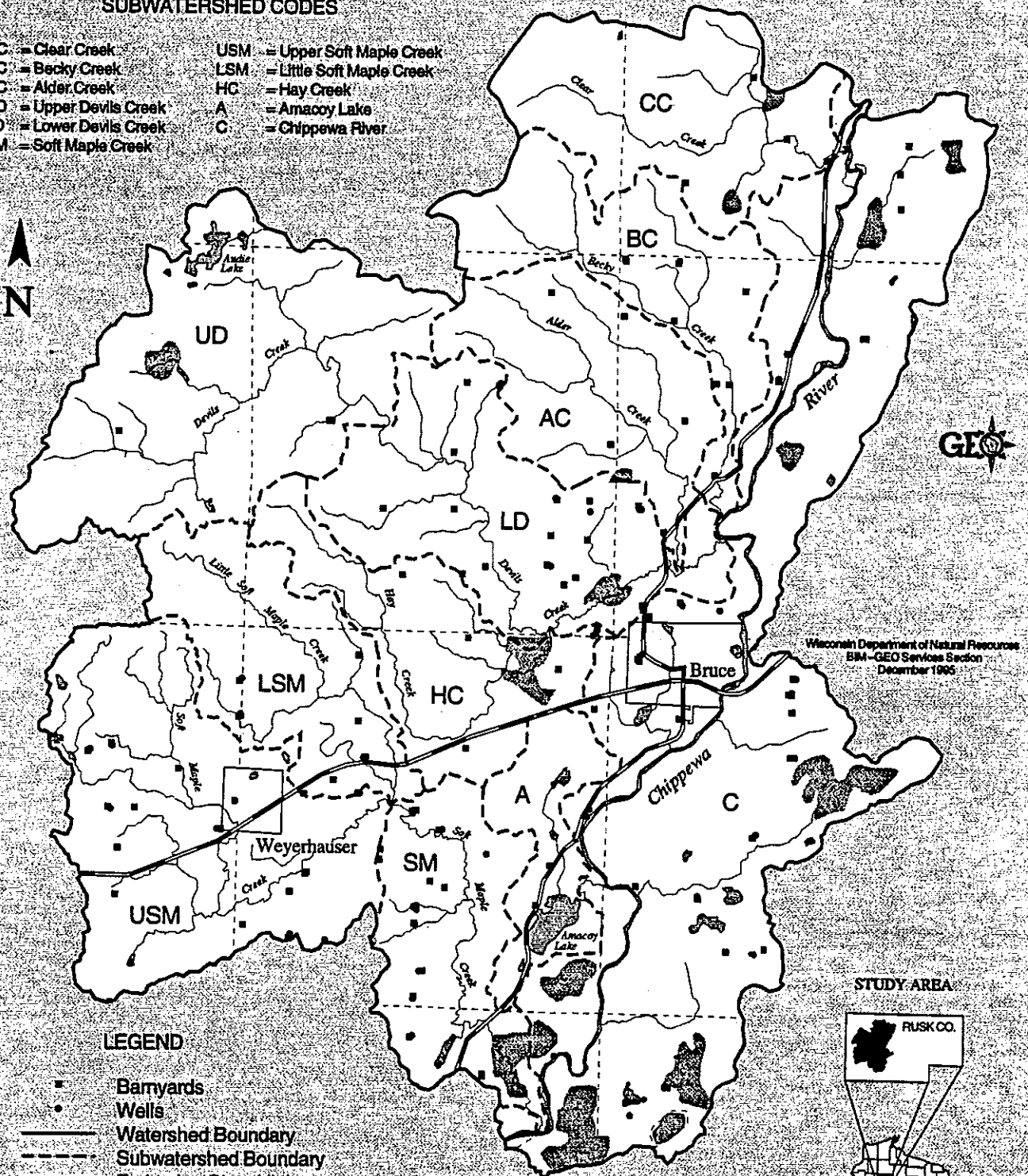
The northwestern part, or the Blue Hills, is dominated by the Ribhill-Magnor association. The well drained Ribhill consists of moderately deep soils formed in 20-40 inches of silty loess and loamy glacial till over quartzite. The somewhat poorly drained Magnor consists of deep soils formed in 12-36 inches of silty deposits over dense loamy glacial till. Permeability is moderate in the silty and loamy mantle and very slow in the dense till. Surface runoff is medium to very rapid on Ribhill soils and very slow to moderate on Magnor soils. These soils are on moraines influenced by quartzite bedrock. Mineral wetland soils do occur within this association.

# Map 2 -1. Subwatersheds of the Soft Maple and Hay Creeks Priority Watershed

## SUBWATERSHED CODES

CC = Clear Creek	USM = Upper Soft Maple Creek
BC = Becky Creek	LSM = Little Soft Maple Creek
AC = Alder Creek	HC = Hay Creek
UD = Upper Devils Creek	A = Amacoy Lake
LD = Lower Devils Creek	C = Chippewa River
SM = Soft Maple Creek	

N



GEO

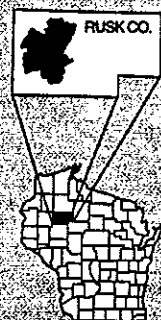
Wisconsin Department of Natural Resources  
BIM-GEO Services Section  
December 1995

## LEGEND

- Barnyards
- Wells
- Watershed Boundary
- - - Subwatershed Boundary
- == Federal or State Highway
- Township or Range Line
- River or Stream
- Open Water
- Wetlands
- Municipal Area

0 1 2 3 4 5 Miles  
0 1 2 3 4 5 6 7 8 Kilometers  
Scale 1:145,000

## STUDY AREA



Soft Maple and Hay Creeks  
Priority Watershed



# General Water Conditions

## *Surface Water and Recreational Resources*

### Recreation

The Soft Maple and Hay Creek Watershed offers diverse and high-quality recreational opportunities. The most popular activities are fishing and canoeing. Other popular activities are wildlife observation, hiking, hunting, and trapping. A major recreational draw in the watershed is the over 38 miles of trout streams. The Chippewa River provides some of the finest and well known canoeing in northwest Wisconsin. The Devils Creek stream reach offers several picnic areas. The Wonderspot Resort and Amacoy Golf Course are located south of Bruce at Amacoy Lake. A series of snowmobile trails are available in the Blue Hills. Rusk County Parks in the watershed include Perch Lake, Audie Flowage and Devil's Creek Campgrounds, with picnic areas at Audie, Perch, and Amacoy Lakes. There are several municipal parks in the Villages of Bruce and Weyerhauser.

### Surface Water Resources

Land drainage patterns in the Soft Maple and Hay Creek Priority Watershed are delineated into 11 individual subwatersheds. All convey surface water directly or via tributaries to the Chippewa River. Major tributaries, associated streams, lakes, wetlands and the stream subwatershed divisions are shown in map 2-1. Table 2-1 shows the general characteristics of fisheries in the Soft Maple and Hay Creek Priority Watershed.

### Subwatersheds in the Soft Maple and Hay Creek Priority Watershed

#### SUBWATERSHED CODES

CC = Clear Creek  
BC = Becky Creek  
AC = Alder Creek  
UD = Upper Devils Creek  
LD = Lower Devils Creek  
SM = Lower Soft Maple Creek  
US = Upper Soft Maple Creek  
LS = Little Soft Maple Creek  
HC = Hay Creek  
AL = Amacoy Lake  
CR = Chippewa River

## *Streams*

Named streams in this watershed include Alder, Becky, Buff, Clear, Devils, Hay, John's, Cranberry, Little Soft Maple, and Soft Maple Creeks and the Chippewa River.

Perennial streams have a combined length of 94.3 miles. The Chippewa River flows through the eastern side of the watershed for 22.7 miles. Soft Maple Creek is the longest perennial tributary and has the highest base flow rate of any of the creeks in the watershed. Devils Creek has a 35 square-mile drainage area which is the largest drainage area of any of the tributary streams.

The Soft Maple and Hay Creek Priority Watershed contains streams with both cold and warm water use classifications [See table 2-1]. Alder, Becky, Clear, Devils, Little Soft Maple and parts of Soft Maple Creeks make up a total of 38 miles of cold water sport fisheries. The Chippewa River and part of Soft Maple Creek are warm water streams. Hay, Buff, and part of Soft Maple Creek combine to make a total of 20.1 miles of warm water forage fisheries in the Watershed. The rehabilitation of high quality cold water streams to their potential use is a major emphasis of the Soft Maple and Hay Creek Priority Watershed Project.

The stream headwaters in the Blue Hills area contains most of the trout fisheries. Management of land uses in the headwaters is an important strategy in this project.

Several of the streams in the watershed are not reaching their highest potential due to pollution from nonpoint sources. Below are the streams not reaching their potential due to nonpoint source impacts.

- \* Becky Creek is being impacted by streambank pasturing, county and township road maintenance and construction, riparian habitat degradation, upland sediment delivery, barnyard and nutrient runoff.
- \* Soft Maple Creek is being impacted by barnyard runoff, roadside erosion, streambank pasturing and habitat degradation.
- \* Devils Creek is being impacted by barnyard runoff, roadside erosion, streambank pasturing, upland sediment delivery and habitat degradation.

Eroding croplands, streambanks, roadways and improperly managed barnyard operations are the major sources of nonpoint pollution in the watershed.

**Table 2-1. Use Classifications of Streams in the Soft Maple and Hay Creek Watershed**

Stream	Length (miles)	Drainage Area (mi <sup>2</sup> )	1995 Classification <sup>1</sup>	Target Classification#
Alder Creek	6.6	11.40	COLD (II) - 1 mi. WWFF - 5.6 mi.*	Unknown*
Becky Creek	8.0	10.74	COLD (I) - 1 mi. (III) - 7.0 mi.	CWSF I - 8.0 mi.
Buff Creek	3.0	6.05	WWFF	Same
Chippewa River	22.7 <sup>2</sup>	1,707	WWSF	Same
Clear Creek	5.7	12.24	COLD (I) - 5.7 mi.	Same
Devils Creek	18.4	35.39 <sup>3</sup>	COLD I - upper 4.5 mi II - mid 7.5 mi III - lower 6.4 mi	Same
Hay Creek	6.9	10.11 <sup>3</sup>	WWFF	Same
Little Soft Maple Creek	6.2	10.68	WWFF - upper 4.2 mi. COLD (I) - lower 2.0 mi.	Same
3 Tribs. of Devils Creek	3.0		COLD (I)	Same
Soft Maple Creek	16.8	29.81 <sup>4</sup>	WWFF (upper 7.0 mi) COLD (III) (middle 2.0 mi) WWSF (lower 7.8 mi)	Same

<sup>1</sup>Cold water classification numbers are defined as:

Class I - sufficient natural reproduction to sustain populations of wild trout

Class II - some natural reproduction of trout; good survival and carryover of stocked adult trout

Class III - no natural reproduction of trout; marginal trout habitat

<sup>2</sup>This length is the segment of the Chippewa River contained in the SMHC watershed.

<sup>3</sup>Hay Creek is a tributary of Devils Creek. Hay Creek's drainage area contributes to the flow measured in Devils Creek.

<sup>4</sup>Little Soft Maple Creek is a tributary of Soft Maple Creek. Little Soft Maple Creek's drainage area contributes to the flow measured in Soft Maple Creek.

#10 year objective - based on 1995 watershed fishery survey

\*Unknown status due to apparent loss of groundwater input to stream. Follow-up study recommended.

COLD= Coldwater Communities include surface waters capable of supporting a community of coldwater fish and other aquatic life or serving as a spawning area for coldwater fish species.

WWSF= Warmwater Sport Fish Communities include surface waters capable of supporting a community of warmwater sport fish and/or serving as a spawning area for warmwater sport fish.

WWFF= Warmwater Forage Fish Communities include surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

LFF= Limited Forage Fish Communities include surface waters of limited capacity and naturally poor water quality or habitat, capable of supporting only limited community of forage fish and other aquatic life.

LAL= Limited Aquatic Life waters include surface waters of severely limited capacity and naturally poor water quality or habitat, capable of supporting only a limited community of aquatic life.

## **Stream Monitoring**

Streams were monitored at one or more sites during 1994. Most streams had an upstream and downstream sampling site. Buff and Hay Creeks had only single sampling sites. Becky Creek had an upper, middle, and lower sampling site. Samples were collected on four dates for a variety of water quality parameters. Three dates were during runoff events when flows were elevated. One date was during a low flow period.

## **Stream Quality**

The large percentage of undeveloped land in the watershed (69%) helps limit the impacts of nonpoint source pollution from developed areas. The large percentage of wetlands in the watershed (18%) also helps buffer the impacts of nonpoint sources on streams by partially trapping sediment and nutrients running off upland areas.

Several parameters were sampled to evaluate the magnitude of the NPS impacts on the stream. Parameters measured include: Total phosphorus concentration, suspended solids concentration, fecal coliform concentration, Hilsenhoff biotic index (HBI), dissolved oxygen and stream habitat values. These parameters called "indicators" provide a good estimate of stream water quality.

### ***Phosphorus***

Mean total phosphorus concentrations ranged from 44 ug/l (micrograms) in the Chippewa River to 200 ug/l in Becky Creek. A mean phosphorus concentration of 50 ug/l appears to be a good estimate of the natural background phosphorus concentration for area streams. Sites on Becky, Soft Maple, and Devils Creeks had the highest phosphorus concentrations.

### ***Suspended Solids***

Suspended solids concentrations ranged from 2 mg/l (milligrams, 1 mg = 1000 ug) in Hay Creek to 52 mg/l in Becky Creek. A mean suspended solids concentration of 10 mg/l appears to be a good estimate of the natural background suspended solids concentration for area streams. Sites on Becky, Devils, and Clear Creeks had the highest suspended solids concentrations.

### ***Fecal Coliform***

Fecal coliform concentrations ranged from 66 per 100 ml in Little Soft Maple Creek to 3,903 per 100 ml in Clear Creek. The State water quality standard for mean fecal coliform concentration is 200 per 100 ml. Concentrations above this pose a risk of disease

transmission through body contact. Twelve of the seventeen stream sites exceeded the standard. Sites on Clear, Becky, Soft Maple, and Devils Creeks had the highest fecal coliform concentrations.

### ***HBI***

HBI values ranged from 1.90 (excellent) in Becky Creek (upper site) to 6.12 (fair) in Hay Creek and Soft Maple Creek (upper site). "Fair" values indicate fairly significant organic pollution, while "excellent" values indicate no apparent organic pollution. The "fair" value for Hay Creek is due primarily to a large wetland complex above the sampling site which causes dissolved oxygen depletion. The "fair" HBI value for Becky Creek (lower site) resulted mostly from deposition of manure residue and sediment on the stream bed.

### ***Dissolved Oxygen***

Those sites with low dissolved oxygen concentrations are usually the same sites which low HBI values. The State dissolved oxygen standard is 5 mg/l for warm water streams and 6 mg/l for cold water streams. Concentrations were below standards at four sites. Hay Creek had the lowest measured value (1.5 mg/l), again due to a large wetland complex above the sampling site. Soft Maple Creek had the second lowest measured value (2.8 mg/l), due to the fairly heavy growths of algae and macrophytes present.

### ***Stream Habitat***

Stream habitat rating scores ranged from 89 for the Chippewa River (upper site) to 193 for Becky Creek (lower site). All ratings were "fair" or "good". The most common habitat limitations were low flows, shallow depths and poor substrate. Habitat was a significant limitation for the Chippewa River (lower site), Devils Creek (lower site), Hay Creek, and Soft Maple Creek (upper and lower site). Lower gradients at these sites allow fine materials to be more readily deposited.

## **Fisheries**

The watershed supports three distinct fish communities: coldwater; warmwater sportfish; and warmwater forage.

Coldwater communities exist in nine streams totaling 38 miles. Within the coldwater category, there are seven Class I streams segments totaling 16.2 miles. There are two Class II streams (8.5 miles) and three Class III segments (13.3 miles). The typical fish community in Class I troutwater consist of wild brook trout, mottled sculpin, longnose dace, blacknose dace and often white sucker and creek chub. Class II streams are typically wider, lower gradient, and more biological and physically diverse than Class I streams. Class II streams usually

include the same species as class I streams (with larger diversity of species) including the following: stocked brown trout, coolwater species like brook lamprey, burbot, pearl and redbelly dace, and a wider variety of warmwater minnows and darters. Class III waters (lower Devils Creek and mid-Soft Maple Creek) are transition zones between a coldwater and a warmwater fish community. As a result, they often contain many of the Class II species plus some typical warmwater species.

The Chippewa River and lower Soft Maple Creek support a true warmwater sportfish community. Soft Maple Creek has an abundant and diverse redhorse component and may include walleyes, esocids, and smallmouth bass. The Chippewa River supports populations of lake sturgeon, channel catfish, and carp. Three named streams (14.8 miles) and all or portions of several unnamed tributaries support warmwater forage communities. The predominant inhabitants in warmwater forage streams include tolerant warmwater minnow species like creek chub, blacknose dace, white sucker and common shiners.

Even in undisturbed habitats, there are severe natural limiting factors to fish diversity and abundance in this drainage system. Some limiting factors include low fertility, climate, severe hydrology, and beaver activity. Several streams in the watershed have very low base-flow relative to their channel morphology because of low groundwater input. The streams in areas with severe slope are sensitive to high peak flows and frequent flood/drought cycles. Beaver have been a destabilizing influence on the coldwater fish habitat and often reduce stream flows. Runoff from road construction and maintenance, livestock pasturing, and agriculture are sources of environmental stress destabilizing the biological integrity of the fish communities.

The 1995 watershed fisheries survey data indicates several areas of extensive environmental stress. There has been a 25% reduction in trout water within the watershed since 1980. Eleven of 20 fish monitoring stations indicated a "stressed" community structure of less than 10% sensitive species and more than 60% tolerant species. The low biological integrity of the fish communities in areas of Becky Creek, Lower Devils Creek and Soft Maple Creek can be linked to impacts from nonpoint source pollution. The low quality of fish communities in Hay, Buff, upper Little Soft Maple and Alder Creeks<sup>1</sup> appears to be linked to natural limiting factors.

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<sup>1</sup>Alder Creek is a special case. The coldwater community has declined dramatically and appears to be threatened by a loss of historic baseflow and diminished ground-water input rather than nonpoint impacts. Further research into the situation is recommended. -

**Table 2-2. Watershed Community Fish Structure**

STATION	PERCENT SENSITIVE SPECIES	PERCENT TOLERANT SPECIES	COLDWATER INDICES OF BIOLOGICAL INTEGRITY
Upper Clear Creek	75	20	70 - Good
Lower Clear Creek	55	35	50 - Fair
Upper Becky Creek	95	5	100 - Best
Mid- Becky Creek	5	87	40 - Poor <sup>3</sup>
Mid- Becky Creek	1	86	0 - Poorest <sup>3</sup>
Lower Becky Creek	2	93	40 - Poor <sup>3</sup>
Upper Alder Creek	7	72	20 - Very Poor <sup>4</sup>
Lower Alder Creek	14	66	20 - Very Poor <sup>4</sup>
Upper Devils Creek	58	24	70 - Good
Middle Devils Creek	54	34	70 - Good
Lower Devils Creek	2	73	40 - Poor <sup>3</sup>
Upper Little Soft Maple	2	58	0 - Poorest <sup>1</sup>
Lower Little Soft Maple	49	41	60 - Fair to Good
Upper Soft Maple	2	92	20 - Very Poor
Middle Soft Maple	4	89	40 - Poor
Hay Creek	1	91	0 - Poorest <sup>1 2</sup>
Buff Creek	0	86	0 - Poorest <sup>1 2</sup>

<sup>1</sup>IBI as calculated probably not appropriate at this station because community is coolwater or warmwater in nature.

<sup>2</sup>Poor conditions believed to be mostly a reflection of extreme natural limiting factors and likely not manageable/mitigatable.

<sup>3</sup>Degraded situation primarily due to man-induced factors and believed to be partially mitigatable via nonpoint abatement activity.

<sup>4</sup>Poor condition due to lack of adequate water quantity.

**Table 2-3. Trout Water Classification Dynamics**

<b>STREAMS</b>	<b>1980 CLASS &amp; MILES</b>	<b>1995 CLASS &amp; MILES</b>	<b>2005 POTENTIAL CLASS &amp; MILES</b>
Little Soft Maple	5.7 <sup>1</sup> (II)	2.0 (I)	2.0 (I)
Soft Maple	6.3 (III)	2.0 (III)	2.0 (II)
Alder <sup>2</sup>	3.7 (II)	1.0 (I)	? (I)
Becky	9.2 (I) <sup>3</sup>	1.0 (I) 5.8(III)	6.8 (I)

<sup>1</sup>The 1980 Little Soft Maple mileage included warmwater headwaters. The upper portion of the stream may never have supported trout.

<sup>2</sup>Alder Creek's present status and future is uncertain due to groundwater and base flow.

<sup>3</sup>Project objectives will be to rehabilitate the entire Becky Creek stream-reach to Class I and elevate cold water portion of Soft Maple Creek stream-reach to Class II.

## **Watershed Lakes**

### **Basic Lake Characteristics**

The watershed contains 13 lakes. Amacoy Lake is the largest, most heavily developed and used lake. Audie and Perch Lakes are surrounded by Rusk County Forest land. The other lakes are small or shallow and have limited development and use. Seven of these lakes are subject to periodic winterkills of fish, primarily because of shallow water depth.

### **Lake Monitoring**

Monitoring was conducted for 10 of the watershed lakes during 1994. The extent of monitoring varied and ranged from a single summer sampling visit to four sampling visits and an aquatic macrophyte survey. Samples were tested for a variety of water quality parameters.

### **Lake Water Quality**

Summer results provide the best means of comparing lakes since all but one lake was sampled at that time. The lakes with the most eutrophication are Amacoy Lake, Unnamed Lake, and Bog Lake. Nitrogen:phosphorus ratios were 15 or more in all but one lake (Perch) which indicates phosphorus limitation is the primary control over algae growth. Sample chlorophyll



concentrations ranged from 4.5 to 44.5 ug/l. Chlorophyll concentrations are positively correlated with total phosphorus concentrations.

Secchi depth ranged from 1.3 m (4.3 ft) to 2.7 m (8.9 ft). Secchi depth is controlled mostly by chlorophyll concentrations, but color reduces water clarity significantly in the more highly colored lakes. Water color is due mostly to drainage from wetland areas. Bass and Bull Moose Lakes are the most highly colored lakes. Wetlands comprise 50% or more of the drainage areas for these lakes. Five of the nine lakes had significant thermal stratification during the summer (Amacoy, Audie, Bass, Perch, Unnamed 34-7-20). Severe dissolved oxygen depletion occurred near the bottom of all these lakes.

The 15 lakes (823 acres) differ in their sports fish component, mainly as a function of depth and winter oxygen conditions. Northern pike are the key predator in shallower lakes that may experience periodic low winter oxygen conditions. Largemouth bass, walleye, and muskellunge occur in waters less prone to winterkill.

**Table 2-4. Summary of Lakes in the Soft Maple and Hay Creek Watershed**

<b>Lake</b>	<b>Area (acres)</b>	<b>Maximum Depth (ft)</b>	<b>Classification</b>
Amacoy	278.0	18	WWSF
Audie	127.7	32	WWSF
Bass	26.0	25	WWSF
Bog	37.1	8	WWSF-WK
Bruce	30.8	4	WWSF-WK
Bull Moose	42.8	4	WWSF-WK
Caley	54.8	6	WWSF-WK
Cranberry	10.1	28	WWSF
Devils Creek Trout Pond	2.0	8	COLD
North	11.2	25	WWSF
Perch	22.6	40	WWSF
Round	104.6	5	WWFF-WK
Unnamed (34-8-13)	29.6	15	WWSF-WK
Unnamed (34-7-20)	12.5	5	WWFF-WK

**KEY**

COLD- Cold Water Sport Fishery

WWFF- Warm Water Forage Fishery

WWSF- Warm Water Sport Fishery

WK- Winter Kill

## Wetlands

Wetlands are valuable natural resources. They provide wildlife habitat, fish spawning and rearing areas, recreation, storage of runoff and flood flows and removal of pollutants. Floodplain wetlands support furbearers and water fowl populations and may provide seasonal habitat for sport fish. Wetlands make up 18 percent of the land area in the Soft Maple and Hay Creek Watershed (18,453 acres). The wetland areas are primarily located in the lowland areas within the Chippewa River floodplain on the eastern half of the watershed and around the Village of Weyerhauser. There are also extensive wetland areas along the riparian corridor of Hay Creek.

Wetlands modify water quality in a number of ways. Decomposition of this organic matter adds color, lowers the pH, and reduces the dissolved oxygen concentration of water. The brown coloration of water drained from wetlands is due to various organic acids released by decomposing vegetation.

In the past, wetlands have been degraded through drainage, grazing, cropping, or other activities causing water storage loss, and build up of sediments. Guidelines for wetland restoration, which will be a component of this project, are outlined in the eligibility for Wetland Restoration and Easements section in this chapter.

**Table 2-5. Wetland Inventory Summary: Soft Maple and Hay Creek Priority Watershed**

TYPE	ACRES
Aquatic Bed	191
Scrub/Shrub	6,127
Forested	6,534
Emergent/wet meadow	1,776
Deep water lake	85
Open water	160

## Groundwater Resources

Groundwater is the main source of drinking water in the Soft Maple and Hay Creek Priority Watershed. Groundwater is stored underground in pore spaces and cracks in soil and rock layers. Soil and rock layers which hold groundwater are called aquifers. In an aquifer, all the pore spaces and cracks are filled or saturated with groundwater. A well is simply a pipe through which groundwater is pumped from an aquifer to the land surface.

Much of the information contained in this groundwater appraisal is summarized from the *"Feasibility Report for the Rusk County Landfill, Inc. Solid Waste Disposal Facility Ladysmith Wisconsin"* (April 1992). The landfill is located in the SE 1/4 of the SE 1/4 of section 4, T34N, R8W, Town of Stubbs in Rusk County. This is within the Hay Creek Watershed north of Weyerhauser and west of Bruce.

See Chapter Two for discussion of watershed topography, soils and geology.

### Hydrology

In the Upper Chippewa River Basin, groundwater generally travels less than 4 miles from its point of recharge to an area of discharge. Groundwater divides generally correspond with surface water divides. Three aquifers are present in the watershed: the glacially deposited sand and gravel; the Cambrian sandstone aquifer; and the Precambrian crystalline bedrock aquifer. Young and Hindall (1972) report that the unconsolidated sand and gravel aquifer is the most commonly used aquifer in the watershed. Private well logs from the Timberline Trail Landfill feasibility study also show most wells are screened in the sand and gravel aquifer. Both the Bruce and Weyerhauser municipal wells draw water from the sand and gravel aquifer. The aquifer ranges from a few feet to 100 feet in thickness within the watershed.

The Cambrian sandstone aquifer is rarely used as a source of drinking water in the watershed. It is used only in areas where the sand and gravel aquifer is thin or nonexistent. Groundwater can be found in only cracks in the Precambrian aquifer and is not used in the watershed to provide drinking water.

### Direction of Groundwater Flow

In general, regional groundwater flow is from northwest to southeast, toward the Chippewa River. The groundwater surface mimics the landscape and the water table is generally within tens of feet of the ground surface.

## Groundwater Quality

Groundwater quality in the Soft Maple and Hay Creek Watershed is generally considered good. As part of the Soft Maple and Hay Creek Watershed barnyard water quality appraisal, 48 private well samples were collected and analyzed for nitrate+nitrite. Sample analytical results are summarized in Table 2-6. Samples analyzed for nitrate+nitrite showed concentrations ranging from no detections to 14.1 parts per million (ppm). The groundwater quality enforcement standard (ES) for nitrate is 10 ppm as defined in ch. NR 140, Wis. Adm. Code. Nitrate concentrations above 2 ppm exceed the state's preventive action limit (PAL). Eight (16%) sample analytical results exceeded the 10 ppm ES and 18 (38%) exceeded the 2 ppm PAL and were less than the ES. Results so far do not indicate a pattern of groundwater contamination that can be linked to specific sources of nitrate.

No samples were collected for coliform bacteria, atrazine, or hazardous substances such as volatile organic compounds. Coliform bacteria can be a drinking water problem where septic systems or barnyards are located uphill from a private well. Bacteria can enter the drinking water supply along the casing of improperly constructed wells. Wells with high levels of bacteria can, at times, be rehabilitated and used.

Volatile organic compounds generally enter a well from nearby leaking underground storage tanks. Once these compounds are in the groundwater they are difficult to cleanup. In general, the contaminated wells have to be abandoned and a new well drilled to an uncontaminated and usually deeper aquifer.

## Groundwater Quality Problems

### Rusk County - Timberline Trail Landfill

The landfill was constructed with a separation of 30 feet between the landfill liner and the top of seasonal high groundwater. The soil is a hard pan which has a low permeability. Given that the landfill has a four foot clay liner and a geoliner, the potential for groundwater contamination seems low in the near future. Quarterly groundwater monitoring results are not yet available. *See Timberline Trail Landfill discussion in Chapter One.*

For detailed listing of sites which can cause groundwater contamination, such as waste disposal sites, LUST, and spills see *other pollution sources* section of Chapter One.

**Table 2-6. Soft Maple and Hay Creek Well Testing Results**

**Nitrate + Nitrite Sample Analytical Results: Fall 1992**  
(given in number of samples)

Subwatershed	< PAL <2ppm/l	>=PAL <ES <2 -10ppm/l	>=ES >10ppm/l
Lower Chippewa	6	6	2
Lower Soft Maple	5	4	0
Upper Soft Maple/Cranberry	6	2	0
Little Soft Maple	1	3	0
Hay Creek	0	1	2
Lower Devils Creek	3	2	4
Upper Chippewa	1	0	0
TOTAL	22	18	8

# Subwatershed Discussions

This section describes the physical and water quality conditions for each subwatershed in the Soft Maple and Hay Creek Priority Project. The information for each subwatershed is defined in five parts: description, water quality conditions, nonpoint source pollutants, water resource goals and overall subwatershed management objectives. A more detailed description of each stream reach can be found in "The Soft Maple and Hay Creek Priority Watershed Surface Water Resource Appraisal" (technical document - Craig Roesler, Wisconsin Department of Natural Resources - Northern Region).

## **Clear Creek Subwatershed (CC) - See Map 2-2**

### ***Description***

The Clear Creek Subwatershed is the northern-most subwatershed in the Soft Maple and Hay Creek Project and is located in Murry Township. The creek is 5.7 miles long with a drainage area of 12.24 square miles. The mouth of Clear Creek empties into the Chippewa River is 500 feet west of State Hwy. 40 in Section 27 in Murry Township.

### ***Water Quality Conditions***

Clear Creek is classified as a Class I cold water stream. The stream gradient is high (44 ft/mi). Drainage area for the upper site is mostly wooded. There are no barnyards present and only some light streambank pasturing was observed. Gravel and rubble comprised more than 50 percent of the substrate at the two sites assessed. Habitat rating at the upper site was fair and at the lower site was good. At the upper site, total phosphorus and suspended solids exceeded "background" levels by 10-20 percent. Mean fecal coliform concentration was near the mid range of all sites sampled. Dissolved oxygen concentrations at the upper site were good, with a minimum concentration of 8.5 mg/l measured. The HBI value was excellent (2.00).

Water quality declined at the lower site. Mean fecal coliform (bacteria) concentration was the highest of any site sampled. Agricultural land use activities increase in the lower drainage area. Four barnyards are present. There is one heavily pastured stream segment and several segments are lightly pastured. Large deposits of manure residue were observed in pool edges near the lower site. Dissolved oxygen concentrations at the lower site were good, with a minimum concentration of 8.3 mg/l measured. The HBI value was excellent (2.78). Limitations to optimum fish production include streambank erosion and instream

habitat loss from excessive riparian pasturing, sedimentation from road construction, and beaver activity.

### ***Nonpoint Source Pollutants***

- The Clear Creek Subwatershed contains three animal lots which contribute a total of 7,200 pounds of COD [organic] annually. This represents an estimated 2.6 percent of the COD for the entire watershed.
- The Clear Creek Subwatershed contains approximately 277 cropland acres above 0.3 tons/acre/year sediment yield. These fields are eligible for erosion control /sediment delivery conservation practices.
- 10.3 percent of the sediment delivered from streambanks in the watershed comes from the Clear Creek Subwatershed:
  - 10 tons/year delivered from trampled streambanks
  - 0 tons/year delivered from accessible streambank sites
  - 81 tons/year delivered from inaccessible streambank sites

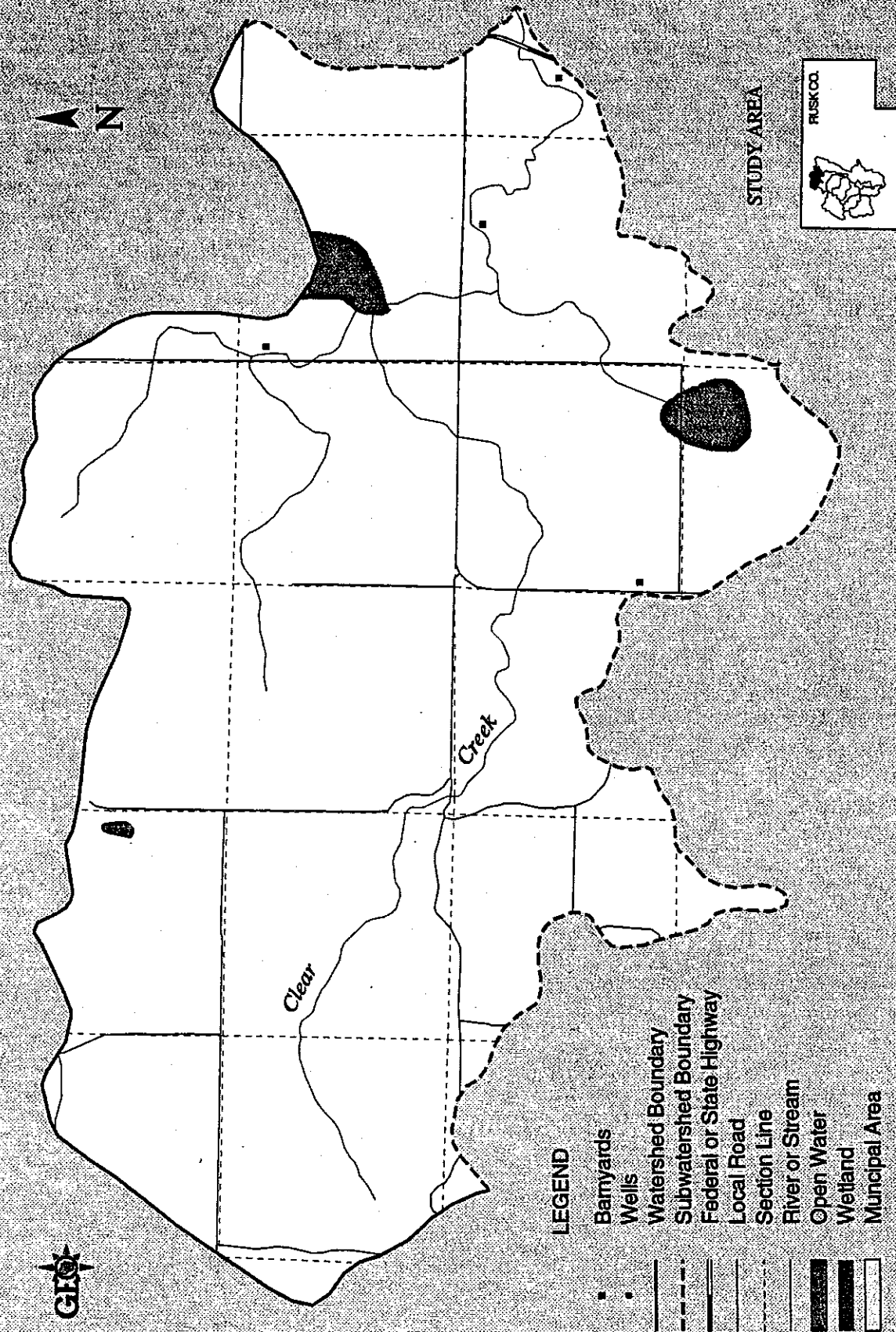
### ***Water Resource Goals***

- Maintain fishery population and habitat.
- Prevent future increases in suspended sediment/solids and COD.
- Reduce fecal coliform.

**OVERALL SUBWATERSHED MANAGEMENT OBJECTIVE:** Determine location of sources responsible for contributing high levels of fecal coliform and examine opportunities for control of pollution sources in lower region of subwatershed.

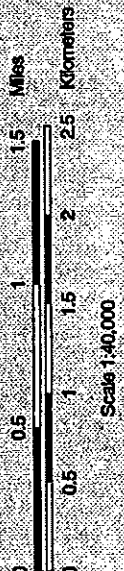


# Map 2 -2. Clear Creek (CC) Subwatershed

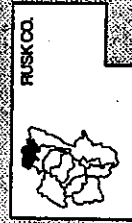


## LEGEND

- Barnyards
- Wells
- Watershed Boundary
- Subwatershed Boundary
- Federal or State Highway
- Local Road
- Section Line
- River or Stream
- Open Water
- Wetland
- Municipal Area



## STUDY AREA



Soft Maple Hay Creek  
Priority Watershed

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December 1995

## **Becky Creek Subwatershed (BC) - See map 2-3.**

The Becky Creek Subwatershed is located in northeast Atlanta Township with headwaters located in southern Murry Township. Becky Creek has a length of 8.0 miles and a drainage area of 10.74 sq. miles. The mouth of the creek flows into the Chippewa River and is located one-half mile south of State Hwy. 40 in Section 29 in northeastern Atlanta Township.

### ***Water Quality Conditions***

A comparison of the middle and lower sites on Becky Creek demonstrates the impacts of barnyard runoff and streambank pasturing in a small agricultural area. The rapid diminishment of brook trout as one proceeds downstream in Becky Creek is clearly related to man-induced environmental degradation (Pratt, 1995).

Becky Creek is classified as a Class I cold water stream. The stream gradient is high (112 ft/mi) in the Blue Hills at elevations above 1,150 ft, and moderate (15 ft/mi) at lower elevations. Habitat ratings were good at the upper site, and fair at the middle and lower sites. Shallow depths and low flows are habitat limitations at all three monitoring sites. Habitat at the lower site is also limited due to bank trampling by cattle and sediment deposition. At the upper site, concentrations of total phosphorus, suspended solids, and fecal coliform approached undisturbed, background levels.

Dissolved oxygen concentrations at the upper site were good, with no evidence of significant oxygen depletion. The HBI value was excellent (1.90) and was the best value of all sites sampled. Water quality declined greatly at the middle site. Total phosphorus and suspended solids increased by 300 percent above background levels. The mean fecal coliform concentration at the middle monitoring was in the upper range of all sites sampled. The drainage area for the middle site includes substantially more agricultural land. The potential for buffering of agricultural source impacts by wetlands is relatively low in this area.

Water quality declined substantially between the middle and lower site. Total phosphorus and suspended solids increased by 50 percent from middle site and was the highest at any site in the watershed. Mean fecal coliform concentration increased 140 percent from the middle site and was the second highest of any monitoring site in the watershed. Fecal coliform concentration exceeded the water quality standard by a factor of about 19. Suspended solids export rates are similarly high. The average suspended solids export per acre from this 179 acres is 11 times higher than the average export from all upstream areas, and 45 times higher than the average export from the undeveloped area above the upper site.

Summer water temperature increased between the middle and lower sites. The August sampling revealed an increase of 7.9°C (14.2°F) from temperature at middle site. The stream channel between the sites is heavily pastured, unshaded, and wide and shallow. The water temperature at the lower site (26.6°C) was above the lethal limit for brook trout.

Summer survival of brook trout below this site is nonexistent. Dissolved oxygen concentrations at the lower site were good. The HBI value worsened from the middle site, and was fair (5.93), indicating significant organic pollution is occurring.

### ***Nonpoint Source Pollutants***

- The Becky Creek Subwatershed contains five animal lots which contribute a total of 11,000 pounds of COD [organic] annually. This represents an estimated 4.5 percent of the COD for the entire watershed.
- The Becky Creek Subwatershed contains approximately 235 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible for erosion control /sediment delivery conservation practices.
- 20.3 percent of the sediment delivered from streambanks in the watershed comes from the Becky Creek Subwatershed.
  - 64 tons/year delivered from trampled streambanks
  - 63 tons/year delivered from accessible streambank sites
  - 52 tons/year delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Restore cold water fishery to entire subwatershed
- Reduce suspended solids
- Reduce COD
- Reduce fecal coliform
- Rehabilitate streambank habitat

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

*Rehabilitate the water resources of Becky Creek Subwatershed by:*

- Target Becky Creek for the highest priority for restoration.
- Limit cattle access to stream.
- Stabilize areas where sediment is being delivered by improper road construction and maintenance.
- Reduce nutrient and organic matter delivery caused by barnyard runoff, manure spreading runoff and management of nutrients.
- Riparian land management including easements will be pursued in headwater section.
- Ensure all forestry activities are planned in accordance with Forestry Best Management Practices.

- Restore subwatershed fish population ratio to at least 10% sensitive species and no more than 60% tolerant species.
- Rehabilitate the lower two-thirds of Becky Creek to a Class I cold water fishery consistent with recent historical fishery data.
- Developing a management program with Atlanta Township
- Development a county-wide construction erosion control ordinance.

# Map 2 -3. Becky Creek (BC) Subwatershed



STUDY AREA



Soft Maple Hay Creek  
Priority Watershed

Chippewa R.

## LEGEND

Barnyards

Wells

Watershed Boundary

Subwatershed Boundary

Federal or State Highway

Local Road

Section Line

River or Stream

Open Water

Wetland

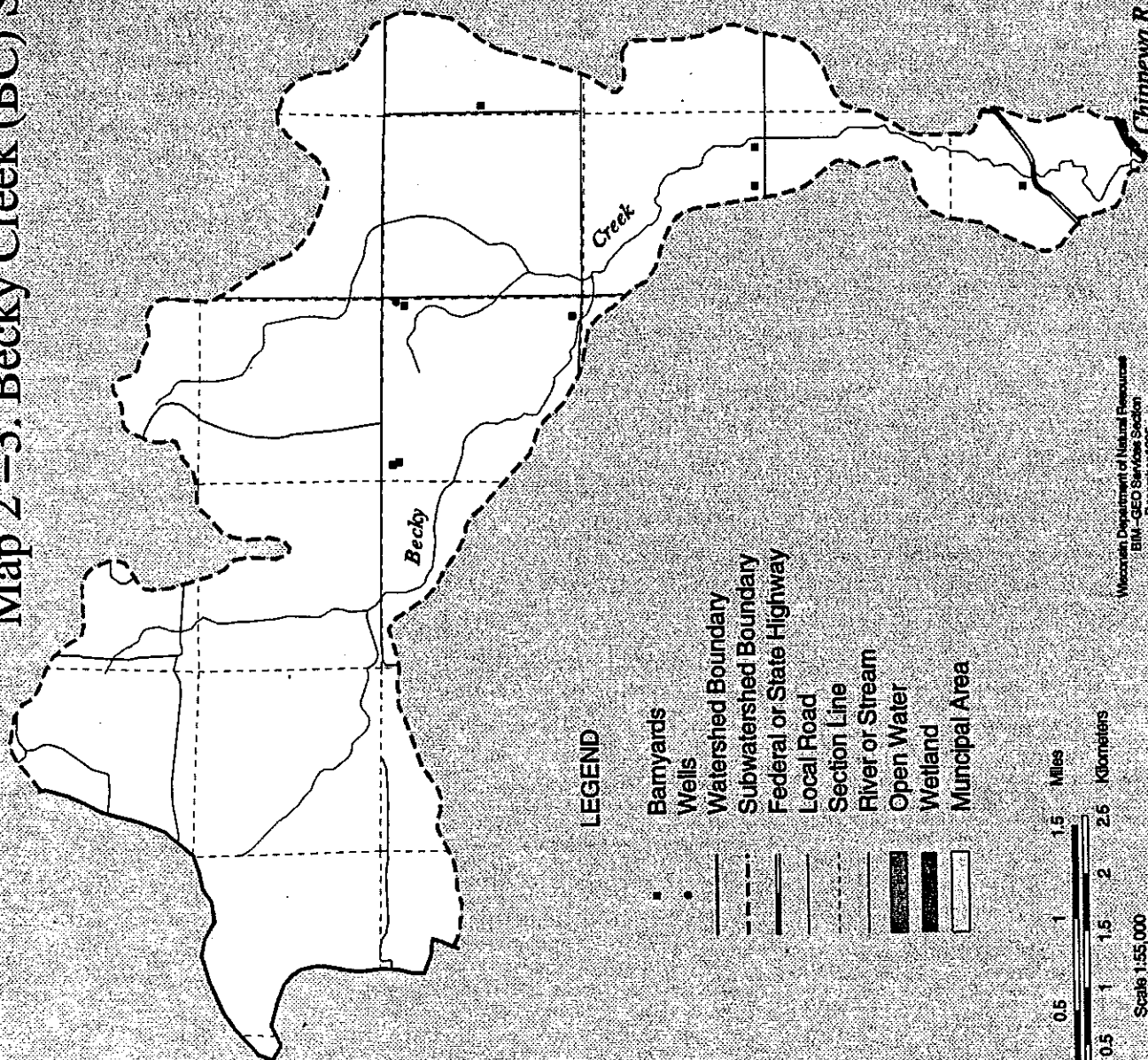
Municipal Area

0 0.5 1 1.5 Miles

0 0.5 1 1.5 2 2.5 Kilometers

Scale 1:55,000

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December 1995



## **Alder Creek Subwatershed (AC) - See Map 2-4**

### ***Description***

Alder Creek Subwatershed is located in central Atlanta Township. Alder Creek is 6.6 miles long with a drainage area of 11.4 square miles and is a tributary to Devils Creek. The confluence is located in Section 31 of Atlanta Township, one-quarter mile east of State Highway 40.

### ***Water Quality Conditions***

Alder Creek water quality is a secondary concern compared to the lack of water baseflow. According to the 1995 fishery survey, Alder Creek had a considerable drop in water baseflow compared to historic data. For example, the 1978 watershed fishery survey indicated a considerable and thriving brook trout population. The explanation of the water quantity problem is unknown. The problem is not thought to be caused by low average rainfall and nonpoint sources or instream habitat change. Further research will be needed to determine possible causes. The recent watershed fisheries survey recommends an in-depth physical inventory to identify water quantity deficits.

Alder Creek is classified as a class I cold water stream. The stream gradient is high (81 ft/mi) in the Blue Hills at elevations above 1,150 ft, and moderate (23 ft/mi) at lower elevations. Habitat ratings at both sites were fair. Shallow depths and low flows were the greatest habitat limitations. At the upper site, concentrations of total phosphorus, suspended solids, and fecal coliform approached undisturbed, background levels. The drainage area for this site is about 90 percent undeveloped. A minimum dissolved oxygen concentration of 4.4 mg/l was measured at the upper site. However, flow was nearly zero at the time of the measurement. The HBI value for this site was 5.49, one of the poorest values found in the watershed. Water quality declined at the lower site. Total phosphorus and suspended solids increased 50 percent above background levels. Mean fecal coliform concentration are in the middle range of all sites sampled. The drainage area for the lower site includes substantially more agricultural land, including four barnyards and segments of heavily pastured streambank. Dissolved oxygen concentrations at the lower site were good. The HBI value was very good (3.70) and was near the mid range of all sites sampled.

Road construction activities, eroding pastures, beaver activity, sediment and nutrients from agricultural runoff limit this stream from achieving its highest potential use. The lack of water is the natural limiting factor to fish production in this stream.

### ***Nonpoint Source Pollutants***

- This Subwatershed contains two animal lots that contribute a total of 1,300 pounds of COD [organic] annually. This represents an estimated 2.0 percent of the COD for the entire watershed.
- This Subwatershed contains 254 cropland acres above 0.3 tons/acre/year sediment yield. These fields are eligible to apply erosion control /sediment delivery conservation practices.
- 10.7 percent of the sediment delivered from streambanks in the watershed comes from the Alder Creek Subwatershed.
  - 1 ton/year delivered from trampled streambanks
  - 24 tons/year delivered from accessible streambank sites
  - 70 tons/year delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Enhance baseflow in stream headwaters
- Reduce suspended solids
- Reduce COD
- Reduce dissolved oxygen demanding material
- Rehabilitate streambank habitat

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

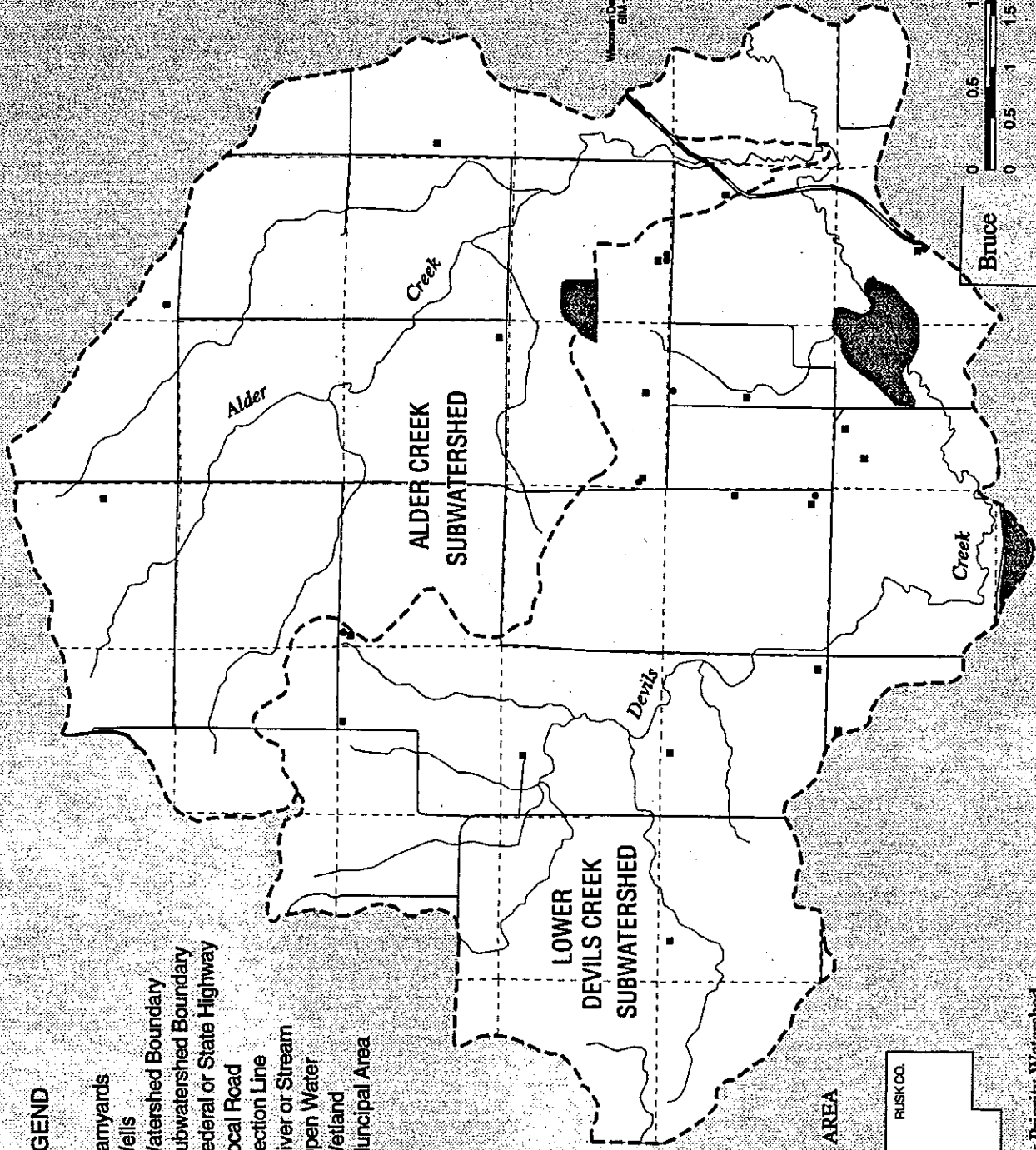
- Restore 25 percent of converted wetlands in the subwatershed (175 acres).
- Further investigate fluctuations in stream hydrology.



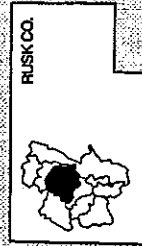
# Map 2-4. Alder Creek (AC) and Lower Devils (LD) Creek Subwatersheds

## LEGEND

- Barnyards
- Wells
- Watershed Boundary
- Subwatershed Boundary
- Federal or State Highway
- Local Road
- Section Line
- River or Stream
- Open Water
- Wetland
- Municipal Area



STUDY AREA



Soft Maple Hay Creek Priority Watershed

Wisconsin Department of Natural Resources  
BIR-GEO Services Section  
December 1986





## **Upper Devils Creek Subwatershed (UD) - See Map 2-5**

### ***Description***

The Upper Devils Creek Subwatershed is located in western Atlanta and eastern Wilkerson Township. Within the subwatershed the creek has a length of 10 miles and a drainage area of 17.8 square miles. Audie Lake is located in the northwest corner of the Subwatershed but is not connected to the Devils Creek drainage area.

### ***Water Quality Conditions***

Devils Creek is classified as a cold water stream. The upper 4.5 miles is class I, the middle 5.5 miles is class II. The stream gradient is high (32 ft/mi) in the Blue Hills at elevations above 1,100 feet. The habitat rating at the upper site was good. Water quality showed significant impacts from nonpoint sources at both sites. At the upper site, total phosphorus exceeded background levels by 130 percent. Suspended solids exceeded background levels by 340 percent. Mean fecal coliform concentration was relatively low and was close to the water quality standard. The drainage area for the upper site is less than 10 percent developed land. Erosion from gravel roads is a very substantial source of suspended solids for the stream. Severe erosion of roads was observed after heavy rains in September. Rechannelization of a short segment of a Devils Creek tributary in May also added to the stream's load of suspended solids. Dissolved oxygen concentrations at the upper site were good, with a minimum concentration of 8.6 mg/l measured. The HBI value was excellent (2.66). Mean fecal coliform concentration was in the upper range of all sites sampled, and exceeded the water quality standard by a factor of 8.

Devils Creek is one of the longest and most diverse, recreational, fisheries in the watershed. Two unnamed streams, Alder Creek, and John's Creek are tributaries of Devils Creek and known to support coldwater fisheries. Limitations to fish production in the Devils Creek system include sedimentation from road construction and crop-land erosion, habitat loss from streambank pasturing, and extensive beaver activity. John's Creek supports a Class I coldwater community and is a major tributary to upper Devils Creek. John's Creek suffers from sedimentation and channelization due to road construction. Audie Lake is a 128 acre drainage impoundment, formerly drained north into the Big Weirgor watershed. A new aeration system has provided conditions more conducive to supporting warmwater sportfish. Devils Creek Trout Pond is a drainage impoundment of an unnamed tributary of Devils Creek. The pond is managed for trout and is a coldwater community. North Lake is an 11.2 acre, landlocked seepage lake. North Lake is classified as a warmwater community. Perch Lake is a 22.6 acre, deep warmwater drainage lake.

### ***Nonpoint Source Pollutants***

- The Upper Devils Creek Subwatershed contains 2 animal lots which contribute a total of 5,000 pounds of COD [organic] annually, representing an estimated 0.2 percent of the COD for the entire watershed.
- The Upper Devils Creek Subwatershed contains approximately 152 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply erosion control /sediment delivery conservation practices.
- 9.6 percent of the sediment delivered from streambanks in the watershed comes from the Upper Devils Creek Subwatershed.
  - 0 tons/yr. delivered from trampled streambanks
  - 0 tons/yr. delivered from accessible streambank sites
  - 85 tons/yr. delivered from inaccessible streambank sites

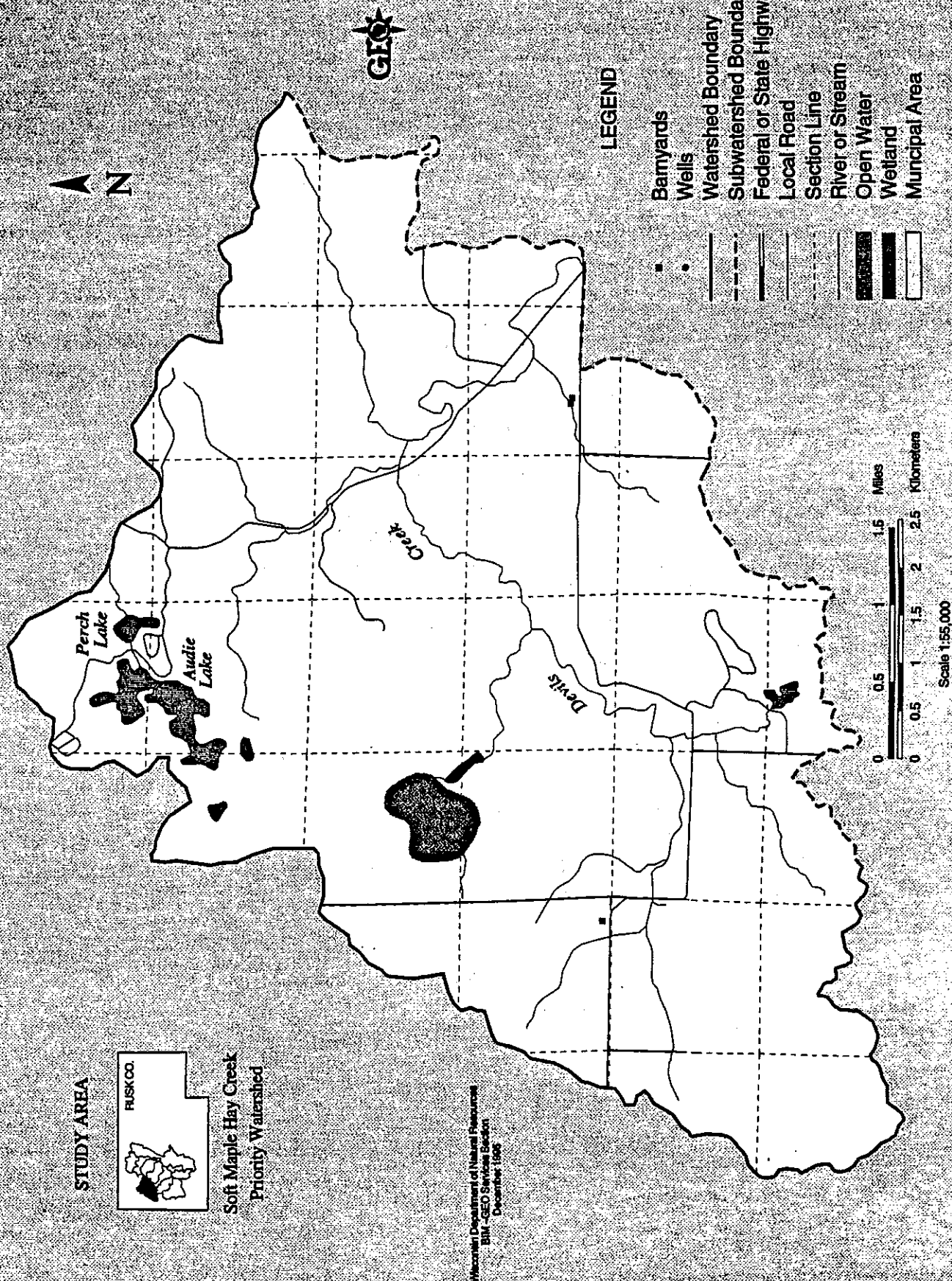
### ***Water Resource Goals***

- Reduce suspended solids

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

- Stabilize areas where improper road construction has led to erosion.
- Improve management of sediment from erosion of newly developed and closed forest access roads.
- Maintain cold water fishery habitat.
- Increasing awareness of construction site erosion control ordinance.
- Encourage landowners to attend forestry and roadway erosion control workshops scheduled for 1996.

# Map 2 -5. Upper Devils Creek (UD) Subwatershed



## **Lower Devils Creek Subwatershed (LD) - See Map 2-4.**

### ***Description***

The Lower Devils Creek Subwatershed is located in central Atlanta Township. Within the subwatershed, the lower section of the creek flows 8.4 miles with a drainage area of 17.6 square miles and empties into the Chippewa River in Section 31 of Atlanta Township.

### ***Water Quality Conditions***

Devils Creek is classified as a cold water stream. The middle 2 miles is class II, and the lower 6.4 miles is class III. The stream gradient is low (7 ft/mi) at lower elevations. The habitat rating at the lower site was fair. Poor substrate and shallow pool depth were the greatest habitat limitations at the lower site. Water quality showed significant impacts from nonpoint sources at both sites. At the lower site, total phosphorus and suspended solids exceeded background levels by about 70 percent.

The drainage area for the lower site includes substantial agricultural areas. Eighteen barnyards and segments of heavily pastured streambanks are present. Impacts from many source areas appear to be buffered by wetlands. Hay Creek is a tributary to Devils Creek above the lower site. Hay Creek has a low total phosphorus and suspended sediment concentrations which contributes to low concentrations in Devils Creek. Dissolved oxygen concentrations at the lower site were good, with a minimum concentration of 6.5 mg/l measured. The HBI value was very good (3.62).

### ***Nonpoint Source Pollutants***

- The Lower Devils Creek Subwatershed contains 16 animal lots which contribute a total of 55,000 pounds of COD [organic] annually. This represents an estimated 17.72 percent of the COD for the entire watershed.
- The Lower Devils Creek Subwatershed contains approximately 364 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply conservation practices.
- 19.0 percent of the sediment delivered from streambanks in the watershed comes from the Lower Devils Creek Subwatershed.
  - 16 tons/year delivered from trampled streambanks
  - 34 tons/year delivered from accessible streambank sites
  - 119 tons/year delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Maintain coldwater fishery population and habitat.
- Reduce nutrients from barnyard runoff.
- Restrict cattle access to stream.

### **OVERALL SUBWATERSHED MANAGEMENT STRATEGY:**

- Stabilize logging access roads in the sections where high grades and stream crossings are delivering sediment to the creek.
- Stabilize areas where improper road construction has occurred.
- Management of sediment from erosion of newly developed and closed forest access roads.

## **Soft Maple (lower) Creek Subwatershed (SM)- See Map 2-6**

### ***Description***

Soft Maple Creek Subwatershed has a 10.7 square mile drainage area and is located in southern Stubbs and northern Big Bend Township. The stream length is 8.4 miles with the mouth to the Chippewa River located in Section 12 of Big Bend Township.

### ***Water Quality Conditions***

Soft Maple Creek has both warm water and cold water classifications. The middle 2.1 miles are a Class III cold water stream. The lower 5.8 miles is a warm water sport fishery. The stream has a total length of 16.8 miles and a drainage area of 29.8 square miles. The stream gradient is moderate (13 ft/mi). Gravel and rubble comprised less than 30 percent of the substrate at the lower site. The habitat rating at the lower site was good. Water quality shows significant impacts from nonpoint sources at both sites. The mean fecal coliform concentration was in the upper range of all sites sampled and exceeded the water quality standard by a factor of 8.

At the lower site, total phosphorus exceeded background levels by 150 percent. Suspended solids exceeded background levels by 10 percent. Mean fecal coliform concentration was in the mid range of sites sampled. The drainage area for the lower site contains substantial agricultural areas and the Village of Weyerhauser. There are 30 barnyards and several segments of heavily pastured streambank. Beaver ponds and wetlands have reduced the suspended solids concentrations. The low flow sample at this site had the highest suspended solids concentration of any low flow sample. The site has turbidity during low flow periods. Dissolved oxygen concentrations at the lower site were good, with a minimum concentration of 6.6 mg/l measured. Turbidity at the lower site probably limits the growth of algae and macrophytes and reduces dissolved oxygen depletion seen at the upper site. Inflow from Little Soft Maple Creek also helps maintain higher dissolved oxygen concentrations.

Soft Maple Creek is a long (16.8 mile) stream with a diverse fishery. Limiting factors include erosion, sedimentation and instream habitat loss from road construction and streambank pasturing, and excessive beaver activity.

Bog Lake is a 37 acre shallow lake that suffers from periodic winterkill. It is classified as a warmwater sport fish community supporting northern pike, minnows, and a limited panfishery.

### ***Nonpoint Source Pollutants***

- The Soft Maple Subwatershed contains 19 animal lots contributing a total of 67,000 pounds of COD [organic] annually. This represents an estimated 16.9 percent of the COD for the entire watershed.
- The Soft Maple Subwatershed contains approximately 408 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply erosion control /sediment delivery conservation practices.
- 6.5 percent of the sediment delivered from streambanks in the watershed comes from the Soft Maple Subwatershed.
  - 7 tons/yr. delivered from trampled streambanks
  - 44 tons/yr. delivered from accessible streambank sites
  - 7 tons/yr. delivered from inaccessible streambank sites

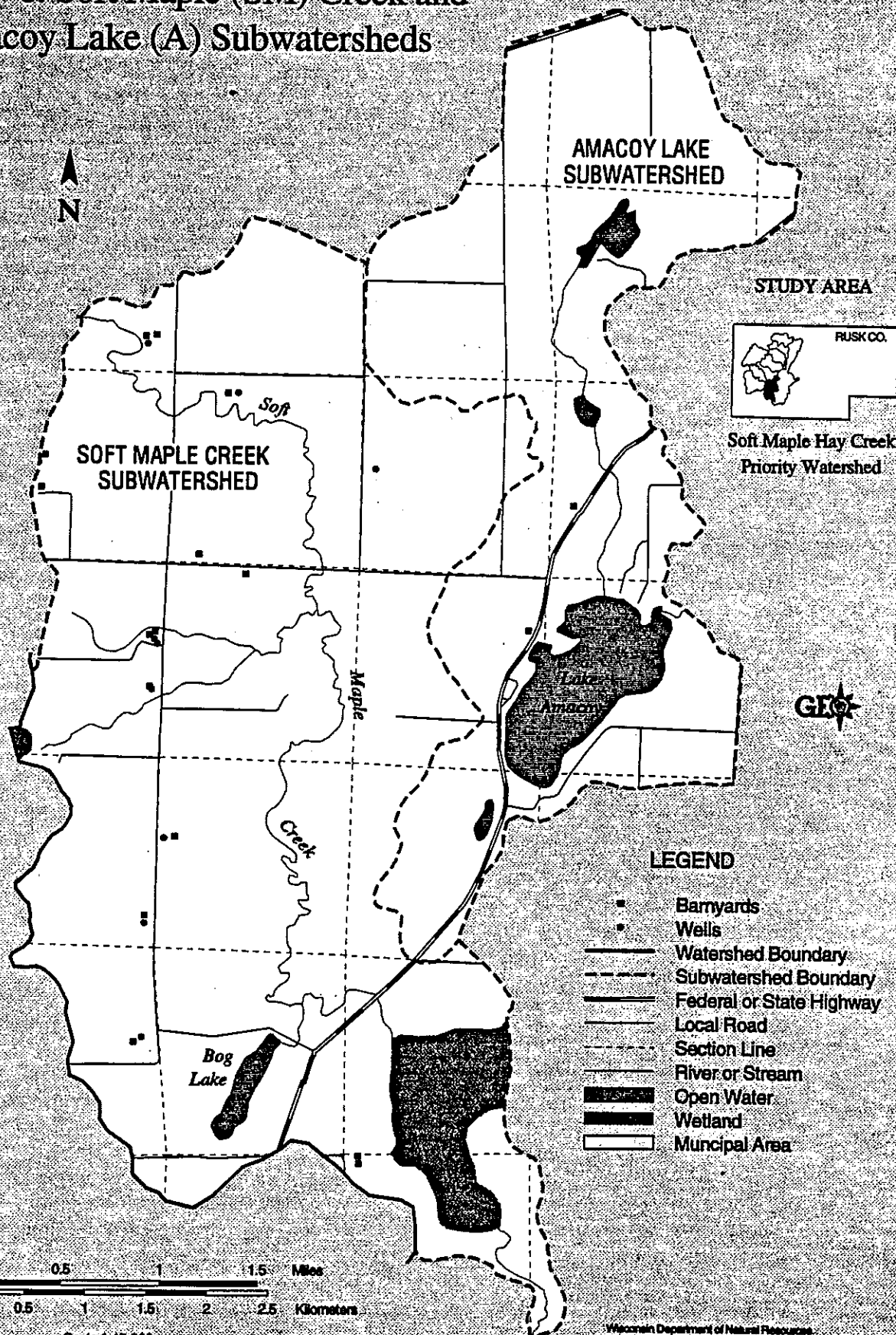
### ***Water Resource Goals***

- Maintain cold water sport fishery classification where it exists currently.
- Maintain warm water sport fishery classification where it exists currently.
- Reduce fecal coliform.
- Reduce COD.
- Reduce suspended solids.
- Increase fishery diversity.

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

- Reduce turbidity and sediment by limiting streambank pasturing in lower 2/3 of the subwatershed.
- Reduce turbidity and COD by limiting runoff from barnyards and pastured streambanks to reduce sedimentation.
- Improve warmwater fishery habitat where possible.
- Maintain the cold water habitat in the upper third of the subwatershed.
- Maintain fish population ratio of at least 10 percent sensitive species and no more than 60 percent tolerant species.

# Map 2-6. Soft Maple (SM) Creek and Amacoy Lake (A) Subwatersheds





## **Upper Soft Maple Subwatershed (US) - See Map 2-7.**

### ***Description***

The Upper Soft Maple Subwatershed is an 18.3 sq. mile drainage area located in western Stubbs and eastern Strickland Township. The creek length is 8.4 miles and leaves the subwatershed at the confluence of Little Soft Maple Creek in Section 16 of Stubbs Township.

### ***Water Quality Conditions***

Soft Maple Creek has both warm water and cold water classifications. The upper 4.7 miles has a warm water forage classification. The middle 6.3 miles is a class III cold water stream. The stream has a total length of 16.8 miles and a drainage area of 29.8 square miles. The stream gradient is moderate (13 ft/mi). Gravel and rubble comprise less than 10% of the substrate at the upper site, the habitat rating was fair at the upper site and good at the lower site. Poor substrate and shallow pool depth were the greatest habitat limitations at the upper site. Water quality showed significant impacts from nonpoint sources at both sites. At the upper site, total phosphorus exceeded background levels by 300 percent and suspended solids exceeded background levels by 60 percent. The mean fecal coliform concentration was in the upper range of all sites sampled and exceeded the water quality standard by a factor of 8.

The drainage area for the upper site contains substantial agricultural areas and the Village of Weyerhauser. There are 15 barnyards and several segments of heavily pastured streambank. The Weyerhauser wastewater treatment ponds discharge to a small tributary of Soft Maple Creek. The ponds are operated on a fill and draw basis. Releases are normally made during periods of high flow. However, samples collected in January, 1995, from the tributary above and below the treatment ponds indicate seepage discharges to the tributary during much of the year. Total phosphorus increased from 20 ug/l above the ponds to 160 ug/l below the ponds. Dissolved oxygen depletion is a problem at the upper site. A minimum dissolved oxygen concentration of 2.8 mg/l was measured. The stream showed wide fluctuations in dissolved oxygen over a 24 hour period. The HBI value was the second worst value in the watershed (6.12) and indicated fairly significant organic pollution.

### ***Nonpoint Source Pollutants***

- The Upper Soft Maple Creek Subwatershed contains 19 animal lots which contribute 67,000 pounds of COD [organic] annually. This represents an estimated 20.3 percent of the COD for the entire watershed.
- The Upper Soft Maple Creek Subwatershed contains approximately 785 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply erosion control /sediment delivery conservation practices.

- The Upper Soft Maple Creek Subwatershed contains approximately 785 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply erosion control /sediment delivery conservation practices.
- 9.9 percent of the sediment delivered from streambanks in the watershed comes from the Upper Soft Maple Subwatershed.
  - 72 tons/yr. delivered from trampled streambanks
  - 6 tons/yr. delivered from accessible streambank sites
  - 10 tons/yr. delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Reduce suspended solids.
- Reduce fecal coliform.
- Reduce COD.
- Reduce delivery of oxygen demanding material.
- Improve warmwater forage fishery in subwatershed.

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

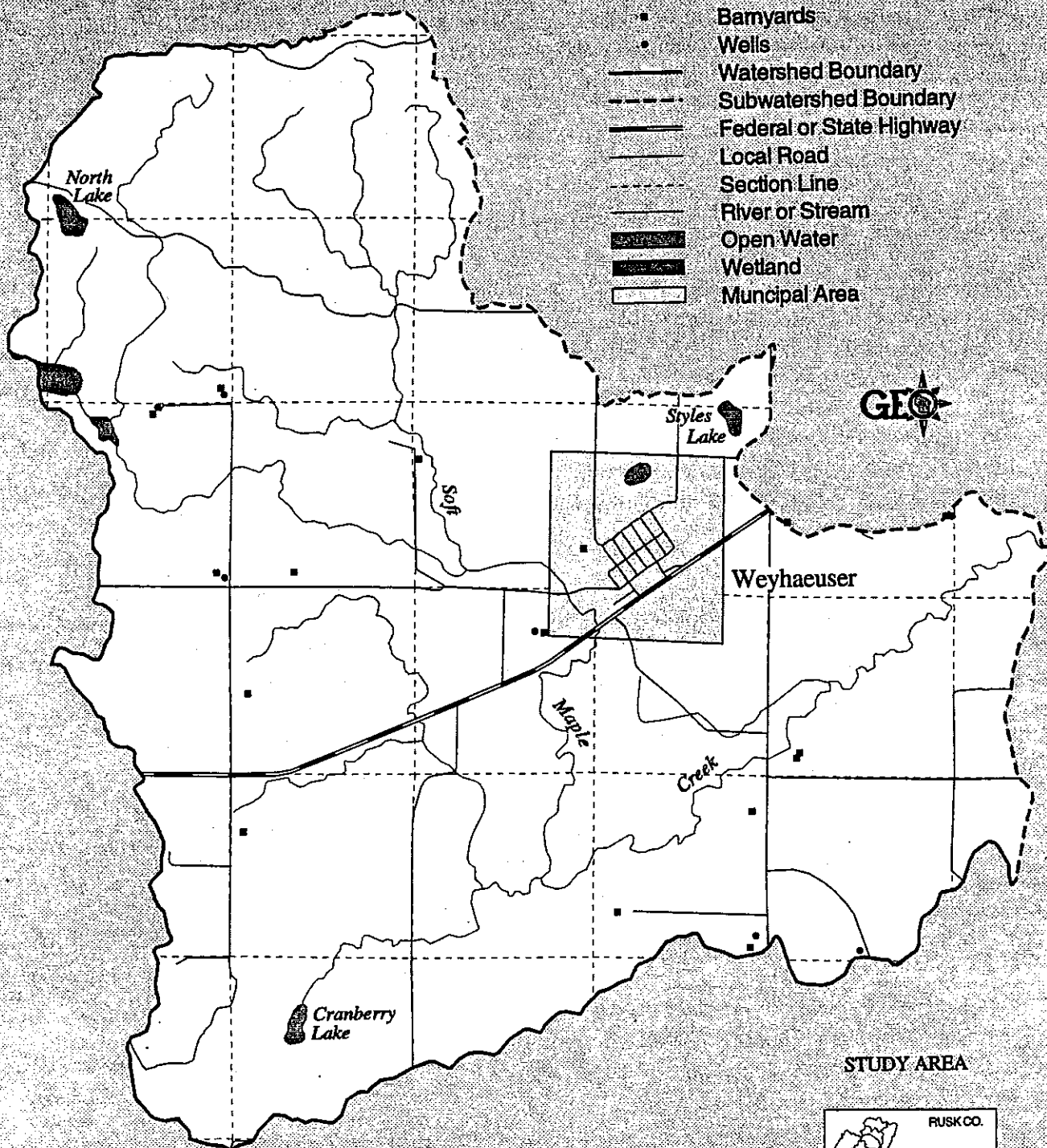
*Rehabilitate the water resources of the Upper Soft Maple Subwatershed by:*

- Reduce COD and sediment delivered to creek by management of runoff from barnyards.
- Reduce sediment delivered to Creek by limiting the access of streambank pasturing.
- Stabilize streambanks at critical locations to reduce instream sedimentation.
- Reduce sediment delivery from sheet and rill erosion.
- Maintain fish population ratio of at least 10 percent sensitive species and no more than 60 percent tolerant species.

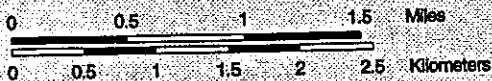
# Map 2-7. Upper Soft Maple Creek (USM) Subwatershed

## LEGEND

- Barnyards
- Wells
- Watershed Boundary
- - - Subwatershed Boundary
- Federal or State Highway
- Local Road
- - - Section Line
- River or Stream
- Open Water
- Wetland
- Municipal Area



## STUDY AREA



Scale 1:50,000

Wisconsin Department of Natural Resources  
BIM-GEO Services Section  
December 1995

Soft Maple Hay Creek  
Priority Watershed

## **Little Soft Maple Creek Subwatershed (LSM) - See Map 2-8.**

### ***Description***

The Little Soft Maple Creek Subwatershed is located at the corners of Wilkerson, Atlanta, Strickland and Stubbs Townships. Within the subwatershed, the stream flows south 6.2 miles and has a drainage area of 10.7 square miles before it enters the Soft Maple Creek in Central Stubbs Township.

### ***Water Quality Conditions***

Little Soft Maple Creek is classified as a class II cold water stream. The stream gradient is high (50 ft/mi). Gravel and rubble comprises more than 50 percent of the substrate at the upper site and 30-50 percent at the lower site. Habitat ratings at both sites are fair. Shallow depths and low flows are the greatest habitat limitations. Total phosphorus and suspended solids concentrations at the upper site were somewhat elevated. The mean fecal coliform concentration was the lowest of any sampling site and was well below the water quality standard. The drainage area for the upper site is 95 percent undeveloped. The source of the elevated total phosphorus and suspended solids concentrations is uncertain. An eroding site seems likely since fecal coliform levels is not elevated. Dissolved oxygen concentrations at the upper site were good, with a minimum concentration of 7.7 mg/l measured. The HBI value was excellent (3.29).

At the lower site, total phosphorus exceeded background levels by about 30 percent, and suspended solids exceeded background levels by about 100 percent. The mean fecal coliform concentration was in the mid range of all sites sampled and exceeded the water quality standard by 1.4 percent. The drainage area for the lower site includes substantial agricultural areas. Four barnyards are present. Wetlands and beaver ponds may be buffering the impacts of agricultural sources. Dissolved oxygen concentrations at the lower site were good, with a minimum concentration of 8.0 mg/l. The HBI value was excellent (3.14).

Its coldwater input into Soft Maple Creek is the primary factor in the ability to support a limited coldwater community. Little Soft Maple suffers from sedimentation and habitat loss due to streambank pasturing and also heavy beaver activity.

### ***Nonpoint Source Pollutants***

- The Little Soft Maple Creek Subwatershed contains four animal lots which contribute a total of 26,000 pounds of COD [organic] annually. This represents an estimated 10.1 percent of the COD for the entire watershed.

- The Little Soft Maple Creek Subwatershed contains 935 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply for conservation practices.
- 5.3 percent of the sediment delivered from streambanks in the watershed comes from the Little Soft Maple Creek Subwatershed.
  - 14 tons/yr. delivered from trampled streambanks
  - 23 tons/yr. delivered from accessible streambank sites
  - 10 tons/yr. delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Maintain and protect the streambank habitat.
- Maintain cold water fish community.
- Reduce nutrient and organic matter delivery.
- Reduce sediment delivery.

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

- Decrease nutrient loading from barnyards and uncontrolled cattle access.
- Develop preservation strategy for streambank habitat, particularly in the lower reaches of the subwatershed.
- Maintain cold water fish community population, particularly in lower reaches of subwatershed; at a minimum, maintain existing baseline fish population ratio.
- Maintain warm water forage fish community population, particularly in upper reaches of subwatershed.
- Decrease sediment delivery from forest roads and skid trails.

## **Hay Creek Subwatershed (HC)- Map 2-10.**

### ***Description***

The Hay Creek Subwatershed is located in northern Stubbs and southern Atlanta Townships. Within the subwatershed, the Creek has a drainage area of 10.1 miles and flows 6.9 miles before entering into Devils Creek at County O.

### ***Water Quality Conditions***

Hay Creek is classified as a warm water forage fish stream. The stream gradient is high (51 ft/mi) in the Blue Hills at elevations above 1,100 ft, and low gradient (3 ft/mi) at lower elevations. Gravel and rubble comprised 10-30% of the substrate at the site assessed. The habitat rating was fair. Shallow depths, low flows, and wetland drainage were the greatest habitat limitations. Water quality was good, with the exception of dissolved oxygen concentrations. Total phosphorus, suspended solids, and fecal coliform concentrations were low and approached background levels. The suspended solids concentrations were the lowest of any sampling site. Total nitrogen concentrations were also the lowest of any sampling site. The lower third of Hay Creek passes through an extensive wetland area. Retention of suspended solids and nutrients in the wetland probably helps maintain the low concentrations found at the mouth of the stream. However, the stream also appeared to be of very good quality above the wetland. While this wetland helps maintain low concentrations of suspended solids and nutrients, it does cause severe dissolved oxygen depletion. Dissolved oxygen concentrations at the sampling site were the lowest of any site, with a minimum concentration of 1.5 mg/l measured.

A landfill was constructed next to Hay Creek during the sampling period. Runoff that collected in a freshly excavated depression was pumped into the creek on one occasion. Runoff from steeply sloped bare soil reached the creek on other occasions. The creek bottom became blanketed with fine sediment below the site. Sampling of macroinvertebrates above and below the site showed 67% decline in the total number of macroinvertebrates below the site. Water quality sampling at the mouth of the creek did not show a noticeable impact from this input of sediment, partly due to the timing of sample collection. The Timberline Trail Landfill managed by Waste Management Inc. is significantly impacting the overall quality of Hay Creek.

Hay Creek is a major tributary to lower Devils Creek. Its entire 6.9 mile length supports a warmwater forage community. Sedimentation and erosion from landfill construction, streambank erosion and instream habitat loss from streambank pasturing road construction, and high beaver populations are all known limitations to optimum fish production in this stream.

### ***Nonpoint Source Pollutants***

- The Hay Creek Subwatershed contains four animal lots that contribute 23,000 pounds of COD [organic] annually. This represents an estimated 7.5 percent of the COD for the entire watershed.
- The Hay Creek Subwatershed has no acres eligible for erosion control conservation practices.
- A large amount of sediment being delivered from the landfill is being delivered via landfill new cell construction.
- 1.9 percent of the sediment delivered from streambanks in the watershed comes from the Hay Creek Subwatershed.
  - 8 tons/yr. delivered from trampled streambanks
  - 0 tons/yr. delivered from accessible streambank sites
  - 9 tons/yr. delivered from inaccessible streambank sites

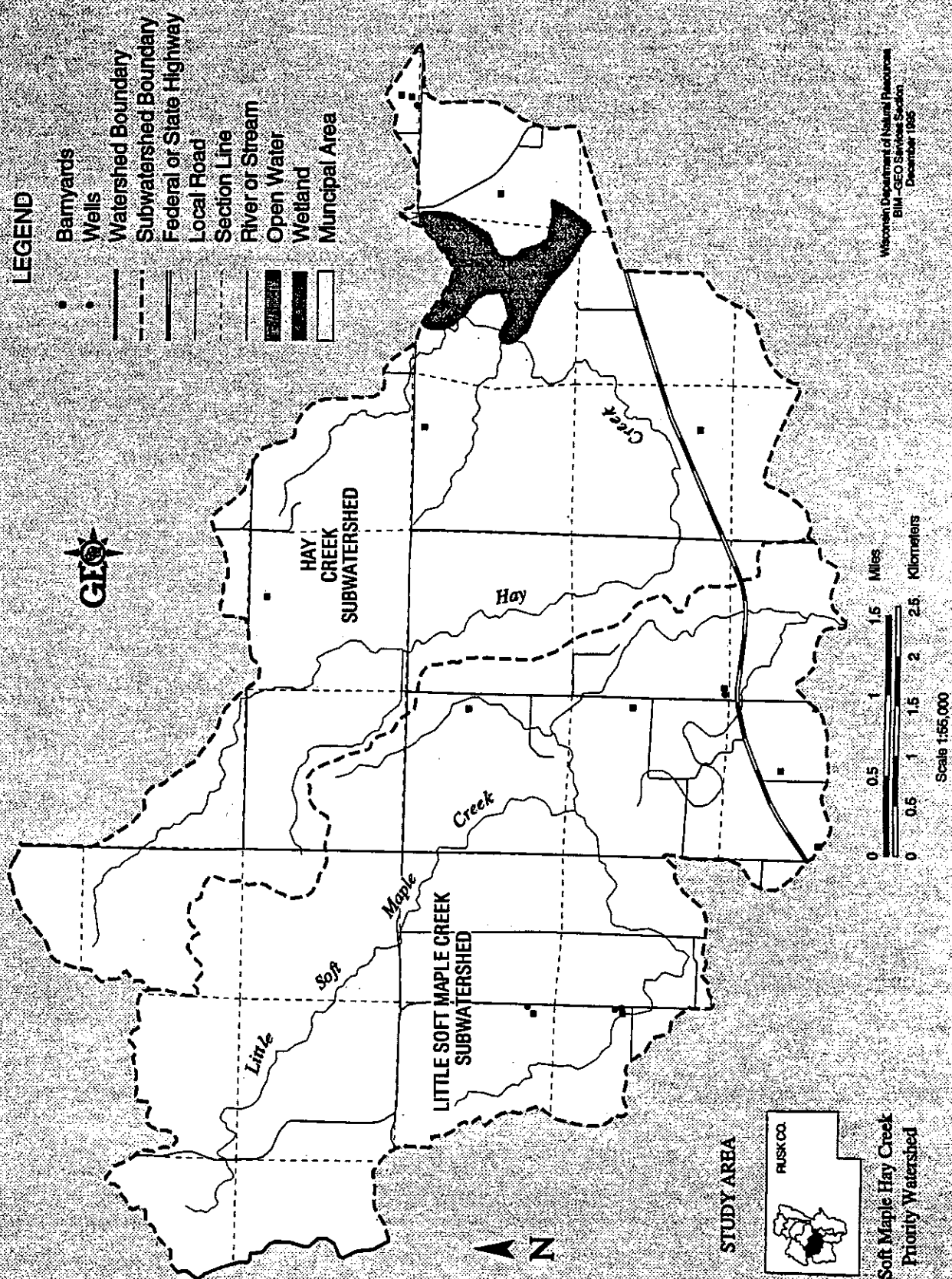
### ***Water Resource Goals***

- Reduce COD
- Reduce suspended solids
- Maintain warm water forage fishery community.

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

- Work with township and county road crews to improve road maintenance procedures to reduce erosion.
- Stabilize areas of improper road construction and maintenance.
- Work with DNR Bureaus of Waste Management and Watershed Management to develop a management strategy for sediment delivery control from Timberline Trail Landfill.

## Map 2 -8. Hay Creek (HC) and Little Soft Maple Creek (LSM) Subwatersheds





## **Amacoy Lake Subwatershed (A)- See Map 2-6.**

### ***Description***

Amacoy Lake has a drainage area of 3,054 acres. Drainage from a large area at the north end of the watershed passes through a pond and wetland complex before reaching the lake. Amacoy Lake is a 278 acre lake with a maximum depth of 20 feet and a mean depth of 13 feet. The shoreline is heavily developed and contains 55 residences, a resort and a restaurant. Lakeshore residents have formed the Amacoy Lake Property Owners Association to protect and improve the lake.

### ***Water Quality Conditions***

Water quality was monitored at Amacoy Lake during 1994 as part of the Soft Maple and Hay Creek Priority Watershed appraisal. Additional monitoring was done for a Lake Management Planning Grant (LMPG) study conducted in 1991-92. It is the largest lake in the watershed and has the most diverse and highest quality warmwater sport fishery. Amacoy Lake's fish community includes muskellunge, northern pike, walleye, largemouth bass, all the common panfish species, minnows, white sucker, redhorse, carp and channel catfish.

Nonpoint nutrient input from cropland runoff is degrading water quality and fish production. The controversial flood control structure on the Amacoy Lake outlet may be curtailing fish migration patterns and recruitment dynamics. Prior to construction of the flood control structure, there was free interchange of floodwater and fish populations between the lake and the Chippewa River.

Amacoy Lake lies within the floodplain of the Chippewa River. The lake has an outlet which drains to the river. A water control structure was constructed for Amacoy Lake in 1967 to stabilize water levels. Some lake residents feel the fishery has declined and the water quality has deteriorated since the installation of the control structure. The structure raised the "normal" lake level which resulted in some negative impacts such as shoreline erosion, elimination of shoreline beaches, and a die-off of large numbers of oak trees. The control structure appears to have had a serious negative effect on the lake's walleye population. However, Amacoy Lake does not have suitable conditions for successful in-lake walleye spawning. The project team has concluded that there is not sufficient evidence, at this time, that a renovated water-control structure will substantially improve water quality in Amacoy Lake.

### ***Nonpoint Source Pollutants***

- The Amacoy Lake Subwatershed contains two animal lots which contribute 165 pounds of phosphorus [organic] annually. This represents an estimated 3.6 percent of the phosphorus for the entire watershed.

- The Amacoy Lake Subwatershed contains 277 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply for erosion control /sediment delivery conservation practices.
- Approximately 205 lbs/year of phosphorus are delivered to Amacoy Lake.

#### ***Water Resource Goals***

- Maintain warmwater fishery community
- Reduce suspended solids
- Reduce COD
- Improve water clarity
- Reduce algae growth in lake

#### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

- Control runoff and increase infiltration from individual lots with installation of buffer strips, grassed waterways, berms, and other suitable approaches.
- Increase quantity of natural vegetation on hillside lots by lake.
- Improve older septic systems
- Reduce nutrient loading from barnyards and uplands.

## **Chippewa Subwatershed (CR)- Map 2-9.**

### ***Description***

The Chippewa Subwatershed is the largest of the drainage area in the watershed, with a drainage area of 54.8 square miles (30.4 percent of watershed). The subwatershed is 22.7 miles in length and borders the entire east side of the watershed.

### ***Water Quality Conditions***

The Chippewa River is classified as a warm water sport fishery. The gradient of this segment is very low (1.7 ft/mi). The 180 square mile drainage area of the Soft Maple and Hay Creek Watershed accounts for only 10.5 percent of the total drainage area of the Chippewa River. Gravel and rubble comprised more than 50 percent of the substrate at the upper site sampled. Gravel and rubble comprised less than 10 percent of the substrate at the lower site, with sand being the dominant substrate at the site. Habitat ratings at both sites were good. The lower site had near background concentrations of total phosphorus, suspended solids, and fecal coliform. The upper site had near background total phosphorus concentrations, but suspended solids and fecal coliform concentrations were higher and were in the mid range of all sampling sites.

Dissolved oxygen concentrations at both sites were good, with minimum concentrations of 8.4 mg/l at the upper site and 7.2 mg/l at the lower site. The HBI value worsened significantly from the upper to the lower site. The HBI value was excellent (2.79) at the upper site, but only very good (4.17) at the lower site.

The Chippewa River shows obvious problems with sedimentation limiting fish habitat. Variable flow conditions exist, due at least in part to upstream peaking. Hydropower facilities are an additional known limitations to Chippewa River fish production. Buff Creek is a 3.0 mile long warmwater forage stream. It does not have a particularly high fisheries potential, nor severe non-point problems. Cranberry Creek (3.0 miles) is a major tributary to the Chippewa River and is classified as a warmwater forage fish community. Streambank pasturing is a limiting factor to its fish production potential.

Bass Lake is a 26 acre, landlocked seepage lake with a sustained warmwater sportsfish community. Bruce Lake is a small (35 acre), shallow lake that experiences winter kill. Bull Moose Lake also has shallow depth and winter kill tendency. Caley Lake is a small (54.8 acre), shallow (6' max.), landlocked seepage lake. Periodic winter kill limits its warmwater sportsfish community. Round Lake is a 104 acre, 5' deep, winter kill lake. It has a very limited panfishery for bullheads, yellow perch, and pumpkinseed. An aeration system is being planned and designed for this lake.

### ***Nonpoint Source Pollutants***

- The Chippewa River Subwatershed contains 32 animal lots which contribute 67,000 pounds of COD [organic], annually. This represents an estimated 19.6 percent of the COD for the entire watershed.
- The Chippewa River Subwatershed contains 2407 cropland acres above 0.3 tons/acre/year sediment yield. These fields will be eligible to apply erosion control /sediment delivery conservation practices.
- 6.5 percent of the sediment delivered from streambanks in the watershed comes from the Chippewa River Subwatershed.
  - 0 tons/yr. delivered from trampled streambanks
  - 23 tons/yr. delivered from accessible streambank sites
  - 35 tons/yr. delivered from inaccessible streambank sites

### ***Water Resource Goals***

- Maintain and enhance fisheries habitat and population diversity.
- Reduce sediment delivered from watershed tributaries.
- Reduce COD delivered to river.
- Reduce fecal coliform to state fishable / swimmable standards.
- Improve older septic systems

### **OVERALL SUBWATERSHED MANAGEMENT OBJECTIVES:**

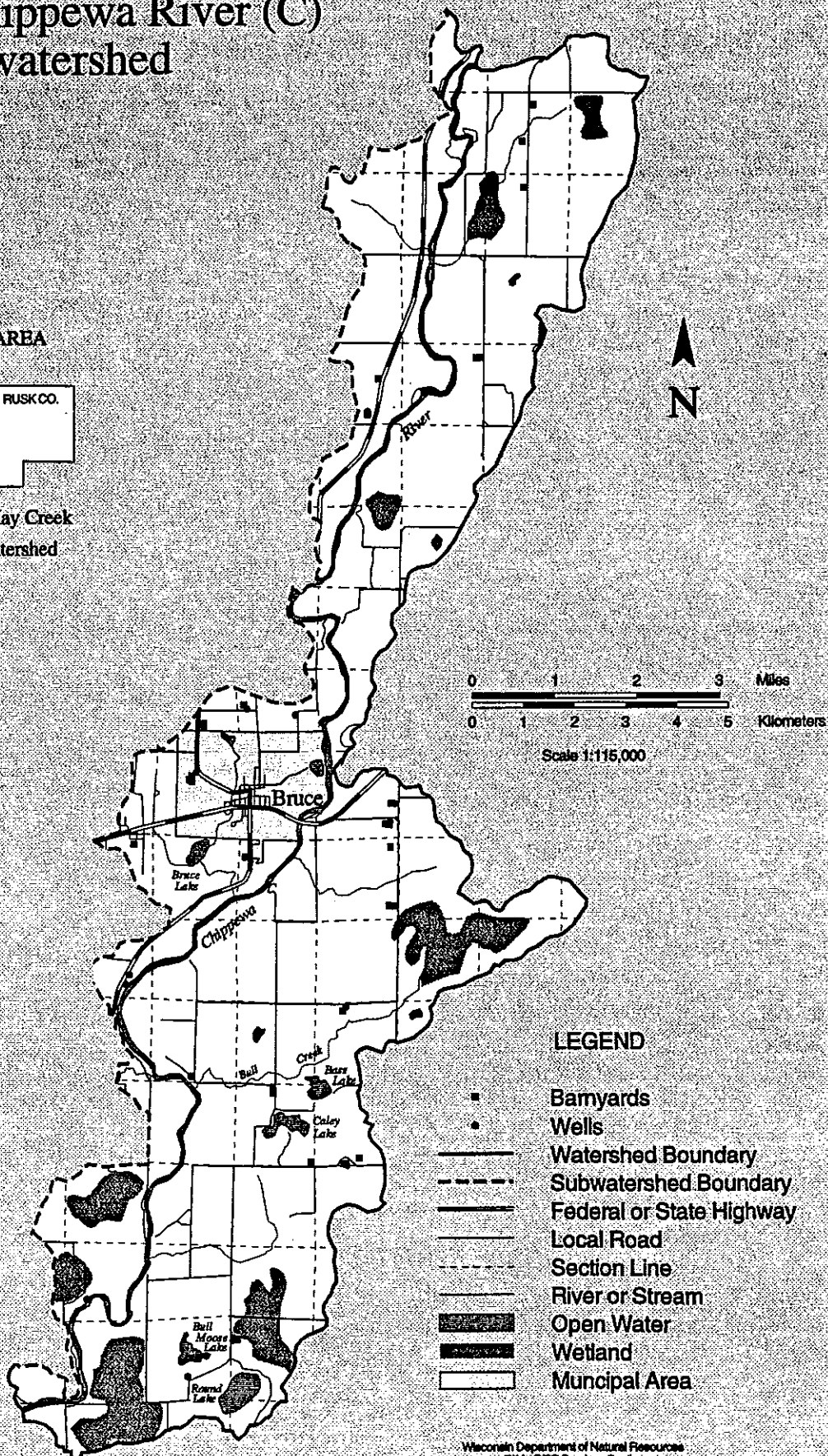
- Achieve a 50% reduction in COD delivered from barnyards within subwatershed and from tributaries within the watershed.

# Map 2-9. Chippewa River (C) Subwatershed

## STUDY AREA



Soft Maple Hay Creek  
Priority Watershed



## LEGEND

- Barnyards
- Wells
- Watershed Boundary
- - - Subwatershed Boundary
- == Federal or State Highway
- Local Road
- - - Section Line
- River or Stream
- Open Water
- Wetland
- Municipal Area

Wisconsin Department of Natural Resources  
BIM - GEO Services Section  
December 1995

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# CHAPTER THREE

## Rural Nonpoint Source Inventory Results, Objectives, and Cost-Share Eligibility Criteria

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This section describes the rural nonpoint source inventories, objectives, and cost-share eligibility criteria for each pollutant source. These sources include barnyard runoff; agricultural nutrients; sediments from uplands, forestry practices, road maintenance and construction, as well as gully and streambank erosion.

**Management Categories** - Cost-share funds for installing pollution control measures will be targeted at sites which contribute the greatest amounts of pollutants. Management categories define which nonpoint sources are eligible for financial and technical assistance; they are based on the amount of pollution generated by a source and the feasibility of controlling the source. Specific sites or areas within the watershed project are designated as either "critical," "eligible," or "ineligible."

Management category eligibility criteria are expressed in terms of tons of sediment delivered to surface waters from eroding uplands and streambanks; feet of streambank trampled by cattle; and pounds of phosphorus [organic] delivered to surface waters from barnyards. Management categories for particular sites may be revised up to the point that a landowner signs a cost-share agreement. Any newly created sources requiring controls after the signing of a cost-share agreement must be controlled at the landowners expense. The County LCD staff will assist landowners in applying BMPs.

**1. Critical Management Category** - Designation as a critical site indicates that controlling that source of pollution is essential for meeting the water quality objectives of the project. Nonpoint sources designated as critical are eligible for funding and technical assistance through the priority watershed project. The owners of critical sites will receive notification to correct the pollution source soon after designation. Critical site criteria may be set through quantitative data or qualitative biological findings as set by biologist or fish specialist.

**2. Eligible Management Category** - Nonpoint sources which are eligible but not critical contribute less of the pollutant load, but are included in cost sharing eligibility to further insure that water quality objectives are met. Landowners with eligible sites need not control every eligible source to receive cost-share assistance. These sites are eligible for technical and cost-share assistance but are not as critical to reaching water quality objectives.

**3. Ineligible Management Category** - Sites which do not contribute significant amounts of pollutants are not eligible for funding or technical assistance under the priority watershed project. Other DNR programs (e.g., wildlife and fisheries management) can, if warranted, assist county project staff to control these sources as part of implementation of the integrated resource management plan for this watershed. Other local, state, or federal programs may also be applicable to these sites.

### **Barnyard Runoff**

Pollutants contained in barnyard runoff are generally of two types: Nutrients (phosphorus and nitrogen) and those that produce what is known as a "chemical oxygen demand (COD)". These pollutants drain to nearby streams, lakes, and wetlands. The amount of nutrients contained in the runoff is important to a lake ecosystem, while COD is most important to stream ecosystems. In this project, phosphorus runoff to the Amacoy Lake subwatershed is examined. In all other subwatersheds, COD is used as a measure of pollution. See Table 3-1 and 3-2 for a summary of barnyard runoff information.

**Table 3-1. Soft Maple and Hay Creek Barnyard Inventory Results**

<b>Subwatershed</b>	<b>Number of Barnyards</b>	<b>Pounds of COD Delivered</b>	<b>% Control by Subwatershed</b>
Soft Maple Creek	38	133,000	40
Devils Creek	15	60,000	18
Becky Creek	6	11,000	3
Clear Creek	3	7,200	2
Chippewa River	28	67,000	20
Hay Creek	4	23,000	7
Little Soft Maple Creek	4	26,000	8
Alder Creek	2	1,300	1
<b>Totals</b>	<b>100</b>	<b>328,500</b>	<b>100</b>
<i>Amacoy Lake - Phosphorus</i>	2	116 <i>pounds P</i>	--



**Table 3-2. Barnyard Runoff Eligible Criteria**

Subwatershed	Critical Management Category			Full System Eligible Management Category			Clean Water Work Eligible Management Category		
	Number of Yards	Target - Pounds Reduced	% of Total Reduced	Number of Yards	Target Pounds Reduced	% of Total Reduced	Number of Yards	Target Pounds Reduced	% Reduced
Soft Maple Creek	1	20,000	6	11	69,000	21	8	8,400	3
Devils Creek	1	13,500	4	7	33,000	10	1	1,000	.3
Becky Creek	1	6,000	2	0	0	0	2	900	.3
Clear Creek	1	2,700	1	0	0	0	2	700	.2
Chippewa River	0	0	0	4	36,000	11	5	7,400	2
Hay Creek	0	0	0	1	19,000	6	0	0	0
Little Soft Maple	0	0	0	2	24,000	7	0	0	0
Alder Creek	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>4</b>	<b>42,200</b>	<b>13%</b>	<b>25</b>	<b>181,000</b>	<b>55%</b>	<b>18</b>	<b>18,400</b>	<b>5.8%</b>

### ***High and Medium Reduction Subwatersheds***

A COD reduction goal of 50 percent has been established for the eight stream subwatersheds. Approximately 100 livestock operations were inventoried in these subwatersheds. These operations contribute an estimated 330,000 pounds of COD to surface water annually.

The eight subwatersheds are grouped according to COD reduction requirements, as follows:

**Table 3-3. Barnyard Runoff Reduction Levels, By Subwatersheds**

HIGH COD REDUCTION	MEDIUM COD REDUCTION
Becky Creek	Alder Creek
Devils Creek	Little Soft Maple Creek
Clear Creek	Hay Creek
Soft Maple Creek	Chippewa River
<i>Amacoy Lake- Phosphorus</i>	

High Reduction Subwatersheds - Four subwatersheds (see above) were chosen as high reduction because the streams showed a high likelihood for improvement if COD impacts to streams are reduced. Barnyards contributing more than 3,000 pounds of COD are eligible for cost sharing of full system barnyard runoff control. Barnyards contributing between 1000 and 3000 pounds are eligible for cost sharing of clean water diversions and roof gutters only.

Medium Reduction Subwatersheds -Four subwatersheds (see above) were chosen as medium reduction because the streams may improve if COD impacts are reduced. Barnyards contributing more than 7,000 pounds of COD are eligible for cost sharing of full system barnyard runoff control. Barnyards contributing between 1000 and 7000 pounds are eligible for cost sharing of clean water diversions and roof gutters only.

One barnyard in the Amacoy Lake subwatershed delivers 94 percent of the phosphorus to the lake. Reducing phosphorus runoff from this barnyard will have a positive impact on water quality of the Lake. Because of the magnitude contributed by this barnyard, it is designated as a critical site and is eligible for cost sharing. The other smaller barnyard is ineligible for cost sharing.

### ***Critical Sites for Barnyards***

Critical sites for barnyard control have been defined as those barnyards contributing 25 percent of the COD needed to reach the project reduction goal in the high reduction level subwatersheds. By designating the barnyards contributing the greatest amount of COD in each of the high reduction subwatersheds, the project will have a greater likelihood of reaching its pollutant reduction goals. Four sites have been identified as critical: one each in Devil, Clear, Becky, and Soft Maple Subwatersheds.

There are no critical sites in the medium reduction level subwatersheds.

### ***Landowner Requirements***

Landowners receiving cost sharing for barnyard runoff (Waste Management System, NRCS Std. 312) are also required to prepare a nutrient management plan (NRCS Std. 590) for their operation. Eligible practices include the development of both nutrient (NRCS Std. 590) and pest management (NRCS Std. 595) plans, soil testing, and crop scouting. A soil conservation plan is necessary for development of a nutrient management plan.

If the planned Waste Management System does not include waste collection, handling, or storage, it may be exempt from the requirement for a nutrient management plan. Such systems may consist of the following practices: Roof Runoff Management (NRCS Std. 588), Livestock Exclusion (NRCS Std. 472), and Clean Water Diversion (NRCS Std. 362).

### ***Internally Drained Barnyards***

Internally drained barnyards drain to surface depressions or wetlands rather than directly to surface waters. Only two internally drained barnyards were identified in the Soft Maple and Hay Creek Priority Watershed project. Eligibility for internally drained barnyards is based on a site-by-site analysis to determine if groundwater contamination is occurring.

### **Nutrient Management**

Livestock operations defined as "critical" and "eligible" qualify for cost-sharing and will be encouraged to participate in nutrient management planning. Approximately 50 farms (5,000 acres) are eligible; see tables 3-1 and 3-2.

Farmers can benefit from nutrient management plans by crediting manure applications and plowing down alfalfa for their fertilizer value. Commercial fertilizer applications are then adjusted to meet crop needs and can usually be reduced. Manure spreading runoff and management of nutrients are addressed through NRCS Standard 590.

Nutrient management plans can be developed by private consultants. Landowners will be eligible to participate for up to three years and will be responsible for paying 50 percent of the consulting fees. The LCD staff will prepare soil conservation plans and materials for the nutrient management plan. The LCD staff will also review completed nutrient management plans for consistency.

Nutrient management activities will result in pollutant load reductions. For this reason, fertilizer application rates must be tracked and reported. Professional service contracts developed for nutrient and pest management consulting must include a provision for reporting the required information to the LCD. The types of data which must be collected and reported may be found on the DATCP worksheet titled "Fertilizer Application Summary Sheet".

## **Manure Storage**

Eligibility for cost-sharing for manure storage practices will be based on the Nutrient Management Plan, developed in compliance with NRCS standard 590, prior to signing of cost-share agreements. Nutrient management plans to determine storage eligibility will be cost-shared at 50 percent. Cost-share agreements for nutrient management only, will be exempt from the 10-year operation and maintenance requirement. Nutrient management is required for a ten year period and must be included on cost share agreements for manure storage or barnyard improvement BMPs.

The operator is required to address the surface water quality impact if the nutrient management plan demonstrates that manure cannot be feasibly managed during periods of snow covered, frozen, and saturated conditions. Cost sharing will be based on the least cost system that will satisfy the Std. 590 specifications and therefore reduce the water quality impact. These options include, but are not limited to: a properly sited unconfined manure stack (in accordance with Std. 312); the construction of a short term storage facility (capacity for 30 to 100 days manure production in accordance with Std. 313); the construction of a long term storage facility (capacity for up to 210 days production in accordance with Std. 313 or 425); a reduction in the number of animals; the rental of additional lands; or giving manure which can not be spread without causing a surface water quality impact to a neighboring farm which can use the manure in accordance with a nutrient management plan.

If storage is installed, the nutrient management plan must also demonstrate that proper utilization of the manure can be achieved following adoption of the intended storage practice. Landowners receiving cost-sharing funds for storage practices are required to adopt a nutrient management plan (Std. 590). Additionally, manure removed from cost-shared storage facilities designed to hold greater than 6 months, shall not be spread on frozen, snow covered or saturated ground, as stated in ch. NR 120. There are no critical sites designated for manure spreading.

### ***Manure Storage Abandonment***

Malfunctioning manure storage facilities as defined in the Rusk County Manure Storage Ordinance will be eligible for cost sharing. Manure pits will be abandoned according to ch. NR 120 requirements, to protect groundwater and surface water. Landowners with storage facilities abandoned under this cost share program will be eligible for cost sharing for new storage facilities.

### ***Manure Storage Ordinance***

Surface water and groundwater resources are at risk when manure storage facilities are improperly located, designed, or constructed. Manure overflows and storage facility failures are a serious threat to aquatic life. Counties adopt manure storage ordinances to prevent ground and surface water pollution by assuring the proper design, construction, location, and management of permitted facilities. An ordinance must meet the guidelines adopted by DATCP and cite the applicable NRCS construction and management standards. Ordinances require permits for the installation, modification and major repair of manure storage facilities. Rusk County enacted a manure storage ordinance in 1985.

### **Agricultural Uplands**

Cropland practices comprise only five percent of the land area in the watershed (see table 3-4 below) and are responsible for only a small quantity of sediment delivery to streams. Because of small area, controlling sediment from cropland is only a minor objective of this project.

**Table 3-4. Land Use in Watershed**

<b>Land Uses</b>	<b>Acres</b>	<b>Percent</b>
Agricultural - Pasture	27,102	25 %
Cropland	5,421	5 %
Woodlots	57,087	51 %
Developed	1,908	1 %
Wetland	18,453	18 %

Given the low erosion rates on most fields, sediment delivery rates are a more accurate measurement for determining eligibility. Some factors responsible for the small quantity of

sediment delivered to streams in the watershed are the quantity of croplands, slope length of cropfields, type of crops planted, planting rotations used, and the topography of riparian areas. Given the quantity of sediment, topography, and land use characteristics of the watershed, critical sites will not be designated as part of the management strategy for upland sediment delivery in this watershed.

Upland sediment sources were evaluated through subarea sampling and extrapolation for the entire watershed (175 square miles). An estimated 8044 tons of soil per year are delivered to wetlands or streams in the watershed from cropland. Conservation upland practices that have been done on cropland in past years involving programs such as CRP, ACP, and Farmland Preservation have not been factored into the existing sediment delivery to wetlands and streams in the watershed. On most agricultural lands in the watershed upland conservation practices have not been installed. Upland sheet and rill erosion is the source of approximately 90 percent of the sediment delivered to surface waters.

A 22 percent reduction in sediment from eroding fields is targeted for agricultural lands. This objective was estimated from using the WINHUSLE /FOCS upland delivery analytical computer model. To achieve a 22 percent reduction, fields contributing sediment to streams at a rate greater than 0.3 tons/acre/year of sediment must reduce sediment delivery to less than or equal to 0.3 tons/acre/year. An estimated 5,847 acres of upland agricultural land is eligible to apply the conservation upland practices stated in Chapter Five.

Several traditional BMPs to reduce sediment delivery may not be installed in the watershed due to socio-economic factors. Land easements will be used in the watershed to achieve permanent sediment reduction through establishment of vegetative cover. Conservation easements will be targeted in areas contributing an excessive rate of sediment delivery. An additional reduction in sediment load will be controlled through use of riparian buffers. The riparian buffer area proposal (See Chapter Five - Interim Best Management Practices) will be needed to reach the pollution reduction objectives and water quality goals in the project.

**Table 3-5. Eligibility Criteria for Upland Erosion.**

Management Category	Sediment Delivery (tons/acre/year)	Reduction Objective (tons/year)
Eligible	$\geq 0.3$ tons/acre/year	$< 0.3$ tons/acre/year
Not Eligible	$< 0.3$ tons/acre /year	N/A

## Gully Erosion

Agricultural gully erosion has not been identified as a significant problem in this watershed, therefore, a field inventory of gully erosion was not done. Any significant gullies identified during implementation will be evaluated to determine if they are significant sediment sources and eligible for cost sharing.

Gully erosion measures are eligible for cost sharing funding throughout the watershed if the gully is determined to be contributing sediment to surface waters. Any landowner that participates in the program will be required to control 50% of the sediment being delivered from actively eroding gullies on their land. Control of gully erosion must be cost effective. Cost per ton of soil saved over a 10 year practice life should not exceed \$40.00. Agricultural gullies in the Becky Creek Subwatershed are high priority for control.

Table 3-6. Eligibility Criteria for Gully Erosion

Management Category	Description	Target Reduction Level
Eligible	Actively eroding gullies	50 % of sediment load from all eroding gullies
Not Eligible	Inactive gullies	N/A

## Forest Land Roads and Skid Trails

Construction of logging roads remove the natural vegetated buffer that holds the soil in place and serves as a barrier to prevent sediment from reaching surface waters. Forestry BMPs are designed to slow or catch the sediment from forestry activities before it reaches the streams. The Soft Maple and Hay Creek Priority Watershed Program will be working closely with the DNR Bureau of Forestry and the Rusk County Forester to develop a detailed management strategy to control erosion.

The average steepness of slopes in the Blue Hills geologic area mandates the use of forestry BMPs for water quality (Koehler, 1992). Improper construction, maintenance, and closure of skid trails and forest haul roads may result in the creation of gullies. Headwaters of several streams in the watershed have been affected by sedimentation due to human activities. Since cropland and cattle streambank erosion are seldom found in these areas, ephemeral and perennial gullying on logging roads and roadway erosion are considered the predominant sources of sediment loading.

There are two categories of forestry activities where watershed management strategies will be implemented: 1) new roads and skid trails, and 2) closed roads where forestry BMPs are needed but have not been installed.

### ***Construction and Maintenance of Active Forest Roads***

Forest roads must be properly constructed and maintained to minimize sediment delivery from active forest sites. BMPs should be applied as needed. They are listed in Chapter 6 of Wisconsin Forestry Best Management Practices For Water Quality, developed by DNR Bureau of Forestry. All new or existing timber sale contracts signed in the watershed are required to integrate the requirements as consistent with the Wisconsin state-wide policy of adopting forestry BMPs. The Rusk County Forestry Department with assistance from Rusk County LCD and the DNR County Forest liaison will be responsible for the development of specific erosion control contract language. All contracts will address preconstruction technical specification of erosion control best management practices, when applicable. The standards and specifications for construction of logging roads in the county will follow Chapter 6 of Forestry BMPs.

### ***Forest Road Closure***

When forest roads are inactive for extended periods, closing the system will help to protect the road surface and the water quality protection structures. When logging projects are completed and the road is closed, all efforts should be made to install BMPs to minimize future erosion, as stated in the Wisconsin Forestry Best Management Practices For Water Quality (page 37, Road Maintenance - inactive roads).

Where sediment erodes into streams, lakes and wetlands grade/critical area stabilization BMPs are recommended. In cases where forestry practices are found to impact the water quality objectives, and traditional erosion control techniques are not acceptable, Rusk County LCD, with assistance from DNR Project staff may apply for an interim forestry erosion BMP through ch. NR 120.15. Section NR 120.14 (11)(b) also states that as a condition of cost-share eligibility, trees may not be sold during the operations and maintenance period. If cost-sharing for forestry practices is needed on an active forestry site which impacts water quality, a variance to ch. NR 120 may be needed. Cost per ton of soil saved over a 10 year practice life should not exceed \$40.00.

Critical Sites for closed forest roads will be those sites delivering greater than 45 tons of sediment in the high priority subwatersheds: Upper Devils, Lower Devils, Lower Soft Maple and Becky Creek.



### ***Private Forest Erosion Control***

Private land cutting sites must file a county cutting notice from the Rusk County Clerk. Private forest lands that are entered into the Managed Forest Law or Forest Stewardship Management Program, must incorporate practices to control soil erosion that adversely impacts water quality. Many BMPs in the forestry BMP field manual may be used to control soil erosion. Standards in Wisconsin's Forestry Best Management Practices for Water Quality must be maintained on private timber sales. The Rusk County Construction Site Erosion Control Ordinance will include standards for private timber sales.

### ***County Land Erosion Control***

Rusk County Forest Land timber sales within the Soft Maple and Hay Creek Watershed require competitive bids. All contracts signed in the watershed on Rusk County land are required to integrate the erosion control components stated in the latest timber sales contract. The Rusk County Forestry Department, with assistance from Rusk County LCD and the DNR County Forest liaison, will be responsible for the development of contract language.

### ***Forest Erosion Control Training Workshop***

An aggressive information and education program will be aimed at loggers actively working in the watershed area. Several forest erosion control training workshops will be held during the watershed project to keep loggers abreast of Forest BMPs. Local loggers and forestry officials are strongly encouraged to participate in these training events. See Chapter Six for more details on forestry erosion control information and education activities.

### ***Eligibility for Forestry BMPs***

All logging work, including newly constructed roads, will be eligible for technical and design consultation from the Rusk County LCD. Cost-sharing will be provided on eroding closed logging roads delivering significant sediment to streams (page 37 in Forestry BMP manual). Closed sites are only eligible only if site is abandoned (no trees will not be sold) throughout the 10-year life of the practice. Cost-sharing for existing road BMPs may also be eligible for Interim Best Management Practices and Alternative Design Criteria as stated in NR 120.15 if requested by project staff.

### ***Proposed Reductions***

Reduce sedimentation delivered from active and closed forest sites to streams by 50% in high priority subwatersheds Lower Soft Maple, Upper Devils, Lower Devils, Becky Creek.

**Table 3-7. Forest Management Eligibility Criteria.**

Management Category	Site Condition
Critical	Closed forest sites delivering > 45 tons/year of sediment
Eligible	1. New roads and skid trails 2. Closed forest roads
Not Eligible	Active forest roads

### **Gravel Roadway Erosion**

Rusk County LCD conducted a gravel road erosion inventory to determine the extent of the sediment being delivered to surface waters. In coordination with UW Extension staff and Wisconsin Department of Transportation (DOT) staff, watershed staff will work with Rusk County Highway Department to develop a program to improve maintenance on gravel roads in the county. A comprehensive construction site erosion control ordinance for Rusk County will be developed to establish standards and specifications for future maintenance of roads within the county.

### ***Identification of Priority Sites***

Road construction and maintenance have been, and continue to be chronic problems in the Soft Maple and Hay Creek watershed. The 1978 watershed fisheries survey made reference to numerous abuses. During the 1995 watershed fisheries survey, erosion from roadway construction and maintenance continued to be noted. In 1994, the Town of Atlanta channelized a tributary of Devils Creek and was mandated to provide habitat restoration. All 207 miles of gravel roads in the Soft Maple and Hay Creek watershed are susceptible to roadway erosion. Proper maintenance and grading can decrease erosion by helping get the water off the road before it runs into creeks. Ephemeral gulling is the most common source of roadway erosion. Photos taken after a rainstorm in 1994 show gullies up to two feet in depth taking place near creeks. Most gravel roads are in headwater areas of streams, with the majority lying in the Blue Hills and areas south of Weyerhaeuser. Most erosion was found where grading of the shoulder produced a berm making it difficult for the water to flow off the road and away from the road. The result was erosion on the road sending tons of sediment to intermittent and perennial streams.

## ***Inventory Results***

A partial and abbreviated inventory was conducted on 105 miles of gravel roads in the watershed. Rusk County LCD staff located 166 gravel road sites that were eroding and contributing sediment to surface waters. The inventory results estimated a total of 294.5 tons/year of sediment is delivered to surface waters from gravel roads. The gravel road inventory results provide only a small cross-section of the total extent of sediment delivery from roads.

## ***Road Construction Erosion Control - Integrated Management***

Local road construction sites over 5 acres are required to receive a WPDES permit. The permit should specify construction site erosion control standards consistent with those stated in the Memorandum of Understanding (MOU) reached between DOT and DNR. Construction and maintenance projects on private land that affect navigable waters of the State require a Ch. 30 permit from DNR District Water Regulation and Zoning staff. Road construction and maintenance projects within municipal boundaries are required to be consistent with Administrative Code TRANS 207. Projects funded by the State are to be consistent with the MOU - liaison agreement between DNR and DOT.

## ***Rusk County Construction Site Erosion Ordinance***

Rusk County Land Conservation Department will complete a comprehensive construction site erosion control ordinance within 24 months of the watershed plan approval. The ordinance will detail the erosion control process and specifications needed on road construction and maintenance projects by townships in Rusk County. The Construction Site Erosion Control Ordinance will be consistent with the MOU reached between DNR and DOT. The Wisconsin County Highway Commission will be involved in the ordinance development. Technical Standards will be based on the Facilities Technical Standards for Erosion Control (WDOT). Administrative Code TRANS 401 will be consulted in the ordinance development. See Construction Site Erosion Section in this Chapter for further details.

## ***Gravel Road Erosion Management Procedures***

All gravel road construction and maintenance projects delivering significant amounts of sediment to surface waters within the watershed shall be addressed for erosion control. County and Township road crews should consult with Rusk County Land Conservation Department before beginning road maintenance and construction projects. Rusk County LCD will advise the County and Township road crews on the proper road maintenance procedures. All road maintenance projects should comply with standards and specifications as stated in Wisconsin Transportation Bulletin, No. 5 "Gravel Roads" and Wisconsin Transportation Bulletin, No. 4 "Road Drainage".

## ***Roadway Erosion Control Training Workshop***

Since roads are maintained by Rusk County Highway Department and local township highway staff, an informative training workshop has been planned for March 1996. The workshop will involve the DOT District 8, DNR District liaison and UWEX staff. The workshop will cover the appropriate methods of grading and ditching as well as laws and policy governing maintenance activities. A pamphlet on correct grading procedures on the effect of sedimentation will be prepared and distributed to all road maintenance crews. Participation from the County and Township staff is necessary to reduce sedimentation from gravel roads.

## **Streambank Erosion**

Streambank erosion contributes 10 percent of the total sediment to surface waters in the Soft Maple and Hay Priority Watershed. An estimated 886 tons of sediment is eroding into streams annually (See table 3-11). For the purpose of setting a management strategy and eligibility for streambank erosion, inventoried streambank sites were classified into three groups: limited accessibility highly eroded streambanks, untrampled highly eroded streambanks, and trampled streambanks.

### ***Limited Accessibility Highly Eroded Streambanks***

Eroding streambanks are frequently repaired by using large machinery to shape and seed the banks or to install riprap. In some cases getting machinery to the site would increase the water quality problem, rather than decrease it. These sites are called "limited accessible". Limited accessible streambank sites are eroding at a rate of 478 tons/ year. Limited accessible streambank sites which the cost of BMPs are less than \$50.00 dollars /ton over a 10 year practice life, will be eligible. BMPs that cost more than \$50.00/ton are not cost-effective and would not be eligible without a plan amendment. A reduction goal of 10% or 48 of the 478 tons/year delivered from limited accessible streambanks will be achieved. Upper and Lower Devils Creek subwatersheds contribute the highest amount of sediment delivered for limited accessible streambank sites. No critical sites will be designated for limited accessible streambank sites.

**Table 3-8. Eligibility Criteria for Limited Accessibility Highly Eroded Streambanks.**

Management Category	Eligibility Criteria	Reduction Objective
Eligible	$\geq$ \$50.00 /ton control cost	10% or 48 tons/year watershed wide
Not Eligible	$<$ \$ 50.00 /ton control cost	N/A

### ***Untrampled Highly Eroded Streambanks***

Untrampled streambank sites are eroding at a rate of 217 tons/year. Untrampled streambank sites which the cost of BMPs are less than \$45.00 dollars/ton over a 10-year practice life, will be eligible. BMPs that cost more than \$45.00 /ton would not be considered a cost-effective practices and not eligible without a plan amendment. A reduction goal of 30% or 65 of 217 tons/year will be controlled. Becky, Upper Devils, and Lower Soft Maple Creek Subwatersheds contribute the largest amount of streambank erosion from untrampled streambank sites. No critical sites will be designated for sites delivering natural streambank erosion.

**Table 3-9. Eligibility Criteria for Untrampled Highly Eroding Streambanks**

<b>Management Category</b>	<b>Eligibility Criteria</b>	<b>Reduction Objective</b>
Eligible	$\geq$ \$45.00 /ton control cost	30% or 65 tons/year watershed wide
Not Eligible	$<$ \$ 45.00 /ton control cost	N/A

### ***Trampled Streambank: Livestock Access***

All streambanks sites are eligible to sign cost-share agreements for installation of streambank fencing, shoreline and streambank buffers, shoreline and streambank stabilization as well as streambank shaping and seeding. Becky Creek, Upper Soft Maple and Hay Creek Subwatersheds have the largest concentration of trampled streambank sites in the watershed. Becky Creek has significant streambank habitat loss as a result of livestock trampling the banks. A reduction goal of 75% or 5.9 miles of degraded streambanks are targeted for improvement. Conservation easements and riparian buffers will be pursued in situations where land use is directly contributing to eroding or trampled streambanks.

**Table 3-10. Eligibility Criteria for Trampled Streambank- Livestock Access.**

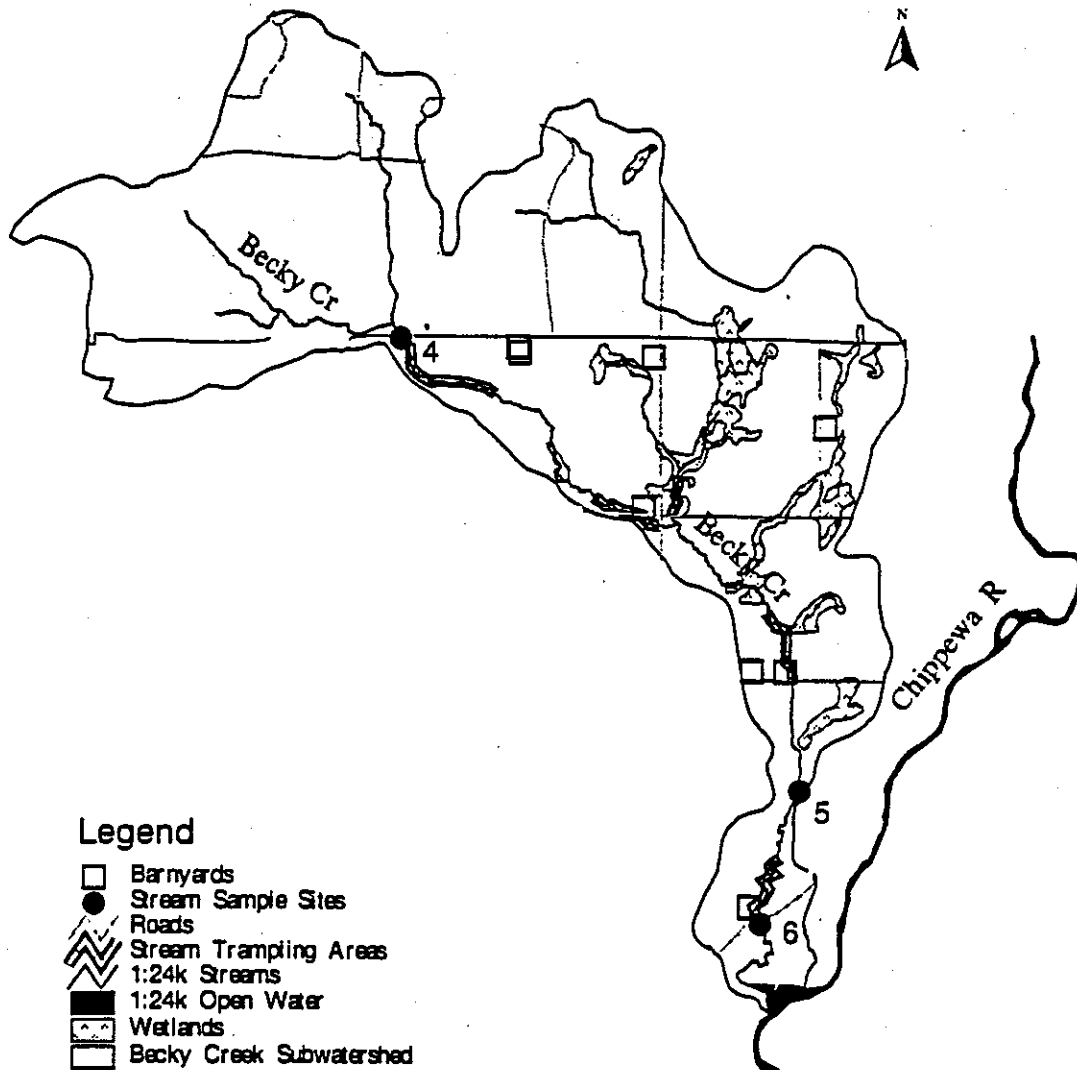
<b>Management Category</b>	<b>Streambank Condition</b>	<b>Reduction Objective</b>
Eligible	Trampled, Degraded / Cattle Access	75% or 5.9 miles of restored streambank - watershed wide
Not Eligible	Vegetated, No Current Cattle Access	N/A

### ***Critical Sites***

Critical Site trampled streambank will include all trampled streambank sites in the Becky Creek Subwatershed. Cattle access in the Becky Creek subwatershed significantly increases the width of the stream and diminishes the population of the trout species in the stream which has historically designated as a cold water sport fishery. A Critical Sites notification letter will be sent to the 3 landowners responsible for the trampled streambank sites within the subwatershed. Critical Sites must be notified within 6 months of plan approval or LWCB approval of Phase 2 revision of NR 120 Admin. Code.

Additional sites on intermittent streams which meet the criteria for eligibility previously given or designated as a critical site may be identified. See table 3-5 for streambank inventory results.

# Map 3-1. Becky Creek Subwatershed



## Legend

- Barnyards
- Stream Sample Sites
- Roads
- Stream Tramplng Areas
- 1:24k Streams
- 1:24k Open Water
- Wetlands
- Becky Creek Subwatershed

## Stream Sampling Results

Site_id	Site_name	Wbic	P ug l	Ss ug l	Pc ug l	Ebi	Min do ug
4	Becky Creek, Upper	2369600	67	17	116	1.90	0.0
5	Becky Creek, Middle	2369600	145	48	2756	4.91	6.8
6	Becky Creek, Lower	2369600	208	66	3529	5.93	6.5

**Table 3-11. Streambank Inventory Results.**

<b>Subwatershed</b>	<b>Feet of Fence Eligible</b>	<b>Accessible Sites Tons/Year</b>	<b>Inaccessible Sites Tons/Year</b>
Lower Devils Creek	12,900	34	119
Upper Devils Creek	0	0	85
Clear Creek	800	0	81
Becky Creek	13,700	63	52
Hay Creek	1,320	0	9
Alder Creek	1,100	24	70
Upper Soft Maple Creek	7,415	6	10
Soft Maple Creek	4,800	44	7
Little Soft Maple Creek	500	23	10
Amacoy Lake	0	23	0
Chippewa River	0	0	35
<b>TOTALS</b>	<b>42,535</b>	<b>217</b>	<b>478</b>

## Construction Site Erosion

### *Description*

Construction sites are those areas in any phase of construction that involves disturbing the soil through grading or excavation. Erosion from construction site erosion is a water quality concern in the watershed. This erosion is found in the construction and/or maintenance of township, county, and forest roads. Erosion can devastate aquatic communities in lakes, wetlands, and streams. Although estimating the rate and degree of erosion being delivered from construction is difficult, documented erosion rates of up to 45 tons/acre/year have occurred in the watershed. This rate of erosion is greater than that which occurs on most severely eroded croplands and streambanks.



## ***Background***

Chapter 236 of the Wisconsin Statutes gives counties the authority to control erosion originating from construction sites and new developments. This chapter establishes the minimum standards and procedures for land development in Wisconsin. The chapter enables local governments that have an established planning agency to adopt ordinances that are more restrictive than the state standards. A Wisconsin Pollutant Discharge Elimination System (WPDES) Permit is required for any construction site greater than five acres.

## ***Ordinance Requirements***

Rusk County will be required to adopt a construction site erosion control ordinance within two years of the date when this document is approved by the DNR. The ordinance will be developed by the Rusk County Land Conservation Department with input from Rusk County Zoning, Township officials, Rusk County Highway, and Rusk County Forestry Departments. The ordinance will establish erosion control requirements for areas of concern within the county.

A local ordinance must meet the applicability and content requirements of s. NR 120.16 dealing with erosion control. The "Model Construction Site Erosion Control Ordinance," developed cooperatively by the DNR and the League of Wisconsin Municipalities (DNR, 1987). Erosion control practice standards and applicability criteria should be consistent with those set forth in the Wisconsin Construction Site Best Management Practice Handbook (DNR, 1989), DNR publication FR-093-95 - Wisconsin Forestry Best Management Practices For Water Quality (Holiday, 1995), Natural Resources Conservation Service Construction Specifications, and Department of Transportation Administrative Code TRANS 400.

## ***Ordinance Recommendations***

- ☐ Forest erosion control will be addressed by use of Forestry BMPs as adopted by the Rusk County Forest 10 Year Plan.
- ☐ The Land Conservation Department will assist the Rusk County Forestry Department with design/installation of BMPs when requested.
- ☐ Any area found in violation of the erosion control ordinance will be issued a stop work order by the LCD until remediation steps have been taken.
- ☐ Technical standards and assistance in erosion control techniques will be available from the LCD and Department of Transportation for township road construction.

## ***General Issues***

- ☐ Rusk County LCD should evaluate staffing and training needs for effective ordinance administration.

- Private loggers and county and township roadcrews should be informed of what is expected of them to reduce erosion.
- Erosion control inspectors need consistent, standardized guidelines for determining when the erosion control ordinance will be applicable.
- An erosion control information and education strategy is a component of the Watershed Information and Education section described in Chapter Seven.

### ***Staff Needs***

Enforcing state and local ordinances can be an effective means to reduce construction site erosion and its adverse water quality impacts. Hiring additional staff may be required as a means of enforcing ordinances as well as increasing awareness of Best Management Practices to loggers and road crews.

## **Eligibility for Wetland Restoration and Easements**

### ***Wetland Restoration***

There are no critical areas for wetland restoration. Wetland sites will be evaluated and classified as eligible for restoration when: 1) county staff complete additional barnyard, streambank and upland inventory work, and 2) when BMP designs are developed. All wetland evaluation information will be done in coordination with the WDNR Bureau of Watershed Management and the DNR Northern Region Biologist. If the site meets the criteria for wetland restoration (as stated below and set by county staff), the site can be eligible for cost-sharing. Wetland restoration for improved water quality will be addressed as a required component of any cost share agreement.

Wetland restoration is considered a BMP for controlling nonpoint sources of pollution. Wetland restoration includes: the plugging or breaking up of existing tile drainage systems, the plugging of open channel drainage systems, restoring the pre-development water levels of an altered wetland, and the fencing of wetlands to exclude livestock. Secondary benefits of wetland restoration may be enhancement of fish and wildlife habitat, and/or enhancement of floral diversity and it's associated aesthetic and recreational benefits. Of particular concern in the watershed is shortage of open water wetlands which serve as habitat for waterfowl. Watershed staff will conduct an inventory to determine wetland areas which have potential of being restored as open water areas.

Wetland restoration is an available option to address any of the following:

1. Cultivated hydric soils with tile or open channel drainage systems discharging to a stream or tributary.

Wetland restoration will reduce the amount of nutrients and pesticides draining from the altered wetland to a water resource either by establishing permanent vegetation or altering the drainage system.

2. Pastured wetlands in the riparian zones of streams, or tributaries.

Eliminating livestock grazing within wetlands will reduce the organic and sediment loading to the wetland and adjacent water resource. Further, it reduces the direct damage to the wetland from trampling by livestock. Livestock exclusion by fencing decreases the pollutant loading and enhance wetland ability to filter and store nutrients.

3. Converted wetlands downslope from fields identified as eligible upland sediment sources.

Restoration of wetlands in these situations will create a wetland filter which reduces the pollutants from an upslope field(s) to a water resource. Two eligibility conditions must be met to use wetland restoration in this situation:

- All upland fields draining to the wetland must be controlled to a soil loss rate that is less than or equal to the soil's "T" value.
- Wetland restoration costs must be the least-cost practice to reach sediment reduction goals.

### *Land Easements*

Nonpoint source program funds may be used to purchase land easements in order to support specified best management practices. These practices, all of which involve the establishment of permanent vegetative cover, include:

- Shoreline Buffers: vegetative areas that reduce nonpoint source impacts and other direct impacts to streams;
- Critical Area Stabilization: stabilization efforts needed on sites that either erode at an excessive rate or have high sediment delivery rates to surface water;
- Wetland Restoration: areas where wetlands are intentionally restored or enhanced in order to improve their ecological values, such as natural filters.

Although easements are not considered a best management practice, they can help achieve desired levels of nonpoint source pollution control in specific conditions. Easements are used

to support best management practices, enhance landowner cooperation and more accurately compensate landowners for loss or altered usage of property. The benefits of using easements in conjunction with a management practice are: 1) riparian easements can provide fish and wildlife habitat along with reducing pollutant loadings; 2) easements are perpetual, so the protection is longer term than a management practice by itself; and 3) an easement may allow for limited public access (depending on the situation). However, the primary justification of an easement must be for water quality improvement.

Easements should be considered in the following situations:

1. To exclude livestock from grazed wetlands or along eroding streambanks within the watershed. Easements are recommended whenever:
  - there is any grazing of wetlands.
  - livestock density is so great that areas of un-vegetated soil are within 60 feet of streams or intermittent streams.
  - there are any severely trampled streambanks indicated in the land use inventory or determined by County staff.
  - channel erosion is exacerbated by livestock grazing such that streambanks that are two feet or more in height.
2. When elimination of row cropping and the establishment of permanent vegetative cover will stabilize a critical area. Easements are recommended whenever:
  - Row cropping is occurring within 60 feet or less of streams or intermittent streams.
  - Row cropping is being practiced on slopes greater than 6 percent.
3. To support eligible wetland restorations. Easements are recommended whenever:
  - The eligible wetland restoration is greater than 10 acres in size.
4. When a barnyard or animal feedlot is located within the flood plain and: a) a permanent easement is the least-cost alternative to provide adequate pollution reduction or b) a permanent easement provides a greater level of pollution reduction than on-site engineering options at a price that is cost-effective. Easements are recommended whenever:
  - Engineering options would require intensive management in order to continue to provide adequate pollution reduction.

Eligibility for easements will be determined by Rusk County LCD staff and the DNR Northern Region Nonpoint Source Coordinator. Easements may be a condition of cost-share agreements.

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## **CHAPTER FOUR**

# **Pollutant Reduction Goals and Project Objectives for Rural Nonpoint Sources**

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Goals for water quality in the Soft Maple and Hay Creek Priority Watershed were identified earlier in the chapter as protection, enhancement, and restoration of water resources. The following is a summary of reductions to be targeted for the entire watershed.

### **Sediment Reduction Objective**

Reduce sediment delivered from upland (sheet and rill) erosion, eroded streambanks, trampled streambanks, as well as those specific roadway and forest road eroding sites. To meet the objective, the following is needed:

- 22 percent reduction in sediment reaching streams from agricultural uplands in all subwatersheds.
- 75 percent rehabilitation of degraded streambank habitat in all subwatersheds (7.4 miles).
- 100 percent reduction in feet of trampled streambank in the Becky Creek Subwatershed.
- 30 percent reduction in accessible streambank sediment delivered to all streams.
- 10 percent reduction in inaccessible streambank sediment delivered to all streams.
- 50 percent reduction in sediment delivery from abandoned forestry sites
- Reduce sediment delivery from roadway maintenance and construction

### **Chemical Oxygen Demand (COD) Reduction Objective**

Reduce overall COD load from manure (organic pollutants) by 50 percent. To meet this goal, the following is needed:

- 50 percent reduction in organic pollutants from barnyards in all subwatersheds.
- Achieve the sediment goal previously determined.
- 9000 acres eligible for nutrient management planning to reduce runoff of landspread manure
- 15 landowners are eligible for manure storage structures if needed as part of nutrient management planning.

Tables 2-7 and 2-8 summarize the COD reduction goals for the Soft Maple and Hay Creek Priority Watershed Project.

### Water Quality Goals and Project Objectives

The DNR staff, with assistance from the Rusk County LCD staff and the DATCP, developed water quality goals and project objectives. Objectives for each subwatershed are included in the next section. Details can be found in the Soft Maple and Hay Creek Priority Watershed Project Appraisal Report (Craig Roesler, 1995) available through DNR's Northern Region Office in Spooner.

Goals for water resources are:

- **Protection:** Protection refers to maintaining the present biological and recreational uses supported by a stream or the reservoir. For example, the Upper Devils and Little Soft Maple subwatersheds support a healthy cold water fishery which will be maintained through project objectives.
- **Enhancement:** Enhancement refers to a change in the overall condition of a stream or lake within its given biological and recreational use category. For example, the main stem of Soft Maple Creek supports a warmwater fishery whose diversity could be enhanced.
- **Restoration:** Restoration refers to upgrading the existing capability of the resource to support a higher category of biological use. An example would be the Becky Creek Subwatershed which historically supported healthy populations of coldwater fish, but no longer does. This goal seeks to improve conditions allowing viable populations of coldwater fish species to become reestablished.

The water quality conditions needed to support the goals for streams and lakes are the basis for determining the type and level of nonpoint source control to be implemented under the priority watershed project.

Project objectives are identified and listed for each subwatershed and for rural and urban nonpoint sources of pollution throughout this chapter.

## **Stream Water Quality Goals**

Four general stream water quality goals have been identified:

1. - Reduce suspended solids concentrations
2. - Reduce total phosphorus concentrations
3. - Reduce fecal coliform concentrations
4. - Minimize water temperature increases in cold water streams

These goals can be directly linked to nonpoint source control efforts. The goals are further explained in the following paragraphs.

The general water quality goals listed below are general, watershed wide goals. For specific subwatershed goals and objectives see subwatershed discussions in Chapter Two.

### **Goal:**

1. **Reduce suspended solids concentrations in watershed streams.**

#### Sources to Control:

Cropland erosion  
Streambank pasturing  
Road erosion  
Bank erosion  
Barnyard and landspread manure runoff  
Construction site erosion  
Urban/residential runoff

#### Benefits:

Reduced deposition of sediment on coarse substrates which are needed for successful spawning of trout, walleye, sturgeon, and other species, and to support high rates of macroinvertebrates production to provide food for fish.  
Reduced sediment filling of stream pools which provide valuable fish habitat.  
Reduced turbidity and improved aesthetic appearance of streams.  
Reduction in the rate of filling of downstream impoundments.

**Goal:**

**2. Reduce total COD concentrations in watershed streams.**

Sources to Control:

Runoff from barnyards, landspread manure and other areas of manure accumulation  
Cropland erosion and fertilizer runoff  
Streambank pasturing  
Other sites of erosion: roads, construction sites, streambanks  
Urban/residential runoff  
Failing septic systems

Benefits:

Reduce abundance of algae and macrophytes in streams and in downstream waters.  
Reduce oxygen depletion resulting from high levels of algae and macrophyte growth.  
Improve aesthetic appearance of streams.  
Reductions in total nitrogen concentrations.  
Reduce loading of oxygen demanding materials.

**Goal:**

**3. Reduce fecal coliform concentrations in watershed streams.**

Sources to Control:

Runoff from barnyards landspread manure and other areas of manure accumulation  
Direct manure deposition in streams where cattle have free access  
Failing septic systems

Benefits:

Reduction of risk of disease transmission by pathogenic bacteria, viruses, and protozoan cysts.



**Goal:**

**4. Minimize water temperature increases in cold water streams.**

**Sources to Control:**

Streambank pasturing  
Other streambank development which removes vegetation and/or results in stream widening

**Benefits:**

Maintenance of suitable water temperatures will allow optimal trout population to exist.  
The effects of stream widening is increased water temperature which is often lethal to trout.  
Most measures to control water temperature will also result in improved bank structure, fish habitat, and erosion control.

**Lake Water Quality Goals**

**Goal:**

**1. Reduce phosphorus and sediment loading.**

**Sources to Control:**

Runoff from barnyards, landspread manure and other areas of manure accumulation  
Cropland erosion and fertilizer runoff  
Streambank pasturing  
Other sites of erosion: county and township roads, forest roads and skid trails, streambanks  
Fertilizer runoff, manure application  
Urban/residential runoff  
Failing septic systems

[CONTINUED ON NEXT PAGE]

**Benefits:**

Improved water clarity  
Reduced algae and macrophyte growth  
Reduced oxygen depletion rates  
Reduction in the rate of filling

**Stream Fishery Goal**

**Goal:**

**Improve fish community structure integrity**

A restored stream reach are defined as a "healthy" fish community of more than 10% abundance of sensitive species combined with less than a 60% tolerant component.

Table 4-1. Summary of Inventory and Appraisal in Subwatersheds

## Land Use Inventory

Sources of Control										Water Resource Monitoring Results					
Sub Watershed	Cropland Erosion	Streambank Pasturing	Road Erosion	Streambank Erosion	Barnyard Runoff	Urban/res. Runoff	Cropland Erosion	Failing Septic	Forestry Erosion	High SS	High P	Fair HBI Rating	Low DO	Poor Streambank Habitat	High FC
Clear Creek					X					✓			✓		✓
Becky Creek		X	X	X	X					✓	✓	✓			✓
Alder Creek													✓		
Upper Devils Creek			X		X				X	✓	✓				
Lower Devils Creek					X				X				✓		✓
Soft Maple Creek				X	X						✓				
Upper Soft Maple		X			X				X		✓	✓			✓
Lower Soft Maple									X				✓		
Hay Creek												✓			
Amacoy Lake					X										
Chippewa River						X							✓		

X = High rate of reduction need in subwatershed.

✓ = High pollutant concentration or concern.

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# CHAPTER FIVE

## Implementation

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### Introduction

This chapter identifies the means for implementing the rural and urban management actions for nonpoint source pollution control described in the previous chapter. The Success of this priority watershed project depends on the aggressive implementation of these nonpoint source pollution control strategies. This chapter identifies:

- The best management practices (BMPs) needed to control nonpoint sources of pollution;
- The cost containment policies;
- The cost-share agreement procedures;
- Schedules for implementing the project;
- The estimated project budget for cost-sharing, staffing, and other support.

### Agricultural and Urban Best Management Practices (BMPs)

#### *BMPs Eligible For Cost-Sharing And Their Rates*

Best management practices control nonpoint sources of pollution and are identified in ch. NR 120, Wis. Admin. Code. Design and installation of all BMPs must meet the conditions listed in ch. NR 120. Generally, these practices use standard specifications included in the NRCS Field Office Technical Guide. In some cases additional specifications may apply. The applicable specifications for each BMP can be found in s. NR 120.14. The Department may also approve other alternative best management practices and design criteria based on the provisions of s. NR 120.15.

If the installation of BMPs destroys significant wildlife habitat, ch. NR 120 requires that habitat will be recreated to replace the habitat lost. The DNR District Private Lands Wildlife Specialist or a designee will assist the LCD in determining the significance of wildlife habitat and the methods used to recreate the habitat. Every effort shall be made during the planning,

design, and installation of BMPs to prevent or minimize the loss of existing wildlife habitat. Wildlife habitat restoration components of the practice are cost-shared at 70 percent.

The practices eligible for cost-sharing and the cost share rates for each BMP are listed in Tables 3-1 and 3-2; the BMPs listed in Table 5-1 can either be cost-shared at 50% or at the flat rates listed.

**Table 5-1. BMP Flat Rates**

<b>BEST MANAGEMENT PRACTICE</b>	<b>FLAT RATE</b>
Contour Farming	\$ 9.00/ac <sup>1</sup>
Contour Stripcropping	\$ 13.50/ac <sup>1</sup>
Field Stripcropping	\$ 7.50/ac
High Residue Management	\$ 18.50/ac <sup>2</sup>
Cropland Protection Cover	\$25.00/ac <sup>2</sup>

<sup>1</sup> Wildlife habitat restoration components of this practice are cost-shared at 70%.

<sup>2</sup> Up to three years.

**Table 5-2. State Cost-Share Rates for Best Management Practices**

BEST MANAGEMENT PRACTICE	STATE COST SHARE RATE
Nutrient and Pesticide Management	50%
Pesticide Handling Spill Control Basins	70%
Livestock Exclusion from Woodlots	50%
Intensive Grazing Management	50% <sup>1</sup>
Manure Storage Facilities	70% <sup>2</sup>
Animal Waste System Storage Abandonment	70%
Field Diversions and Terraces	70%
Grassed Waterways	70%
Critical Area Stabilization	70% <sup>3</sup>
Grade Stabilization Structures	70%
Agricultural Sediment Basins	70%
Shoreline and Streambank Stabilization	70% <sup>3</sup>
Shoreline Buffers	70% <sup>3</sup>
Wetland Restoration	70% <sup>3</sup>
Barnyard Runoff Management	70%
Animal Lot Relocation	70%
Roofs for Barnyard Runoff Management and Manure Storage Facilities	70%
Structural Urban BMPs	70% <sup>4</sup>
Milking Center Waste Control	70%
Cattle Mounds	70%
Lake Sediment Treatment	70%

<sup>1</sup> To a maximum of \$2,000 per watering system

<sup>2</sup> Maximum cost share amount is \$35,000 for manure storage including manure transfer equipment

<sup>3</sup> Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs. See Chapter Two for an explanation of where easements may apply.

<sup>4</sup> The maximum cost-share rate for land acquisition, storm sewer rerouting, and removal of structures necessary to install structural urban BMPs is 50%.

*Following is a brief description of some of the most commonly used BMPs listed above. A more detailed description of these practices can be found in s. NR 120.14.*

**Contour Farming.** The farming of sloped land so that all operations from seed bed preparation to harvest are done on the contour.

**Contour Stripcropping.** Growing crops in a systematic arrangement of strips or bands, on the contour, in alternate strips of close grown crops such as grasses or legumes, and row-crops.

**Field Diversions.** The purpose of this practice is primarily to divert water from areas it is in excess or is doing damage to where it can be transported safely.

**Terraces.** A system of ridges and channels with suitable spacing and constructed on the contour with a suitable grade to prevent erosion in the channel.

**Grassed Waterways.** A natural or constructed channel shaped, graded and established with suitable cover as needed to prevent erosion by runoff waters.

**Reduced Tillage.** A system which leaves at least 30 percent of the ground covered with crop residue after crops are planted. It is utilized in two situations; one for continuous (at least 3 consecutive years) row crops, the other for short crop rotations (no more than 2 years corn and small grains and hay) or for the establishment of forages and small grains.

**Nutrient Management.** The management and crediting of nutrients from all sources, including legumes, manure, and soil reserves to determine the correct application rate of manure and commercial fertilizers. Management includes the rate, method and timing of the application of all sources of nutrients to minimize the amount of nutrients entering surface or groundwater. This practice includes manure nutrient testing, routine soil testing, and residual nitrogen soil testing.

**Pesticide Management.** The management of the handling, disposal and application of pesticides including the rate, method and timing of application to minimize the amount of pesticides entering surface and groundwater. This practice includes integrated pest management scouting and planning.

**Cropland Protection Cover (Green Manure).** Cropland protection cover is close-growing grasses, legumes or small grain grown for seasonal soil erosion protection and soil improvement.

**Intensive Grazing Management (Rotational Grazing).** Intensive grazing management is the division of pastures into multiple cells that receive a short but intensive grazing period followed by a period of recovery of the vegetative cover. Rotational grazing systems can

correct existing pasturing practices that result in degradation and should replace the practice of summer dry-lots when this practice results in water quality degradation.

**Critical Area Stabilization.** The planting of suitable vegetation on nonpoint source sites and other treatment necessary to stabilize eroding lands.

**Grade Stabilization Structure.** A structure used to reduce the grade in a channel to protect the channel from erosion or to prevent the formation or advance of gullies.

**Agricultural Sediment Basins.** A structure designed to reduce the transport of sediment of other pollutants eroded from agricultural fields to surface waters and wetlands.

**Shoreline and Streambank Stabilization.** The stabilization and protection of stream and lake banks against erosion and the protection of fish habitat and water quality from livestock access.

**Shoreline Buffers.** A permanently vegetated area immediately adjacent to lakes, streams, channels and wetlands designed and constructed to manage critical nonpoint sources or to filter pollutants from nonpoint sources.

**Lake Sediment Treatment.** Lake sediment treatment is a chemical, physical, or biological treatment of polluted lake sediments. Sources of pollution to the lake must be controlled prior to treatment of lake sediments. Treatment does not include dredging.

**Wetland Restoration.** The construction of berms or destruction of the function of tile lines or drainage ditches to create conditions suitable for wetland vegetation.

**Barnyard Runoff Management.** Structural measures to redirect surface runoff around the barnyard, and collect, convey or temporarily store runoff from the barnyard.

**Animal Lot Relocation.** Relocation of an animal lot from a critical site such as a floodway to a suitable site to minimize the amount of pollutants from the lot to surface or groundwater.

**Manure Storage Facility.** A structure for the storage of manure for a period of time that is needed to reduce the impact of manure as a nonpoint source of pollution. Livestock operations where this practice applies are those where manure is winter spread on fields that have a high potential for runoff to lakes, streams and groundwater. The facility is needed to store and properly spread manure according to a management plan.

**Manure Storage System Abandonment.** Manure storage system abandonment is the proper abandonment of leaking and improperly sited manure storage systems, including: a system with bottom at or below groundwater level; a system where the pit fills with groundwater; a system where the pit leads into the bedrock; a system which has documented reports of



discharging manure into surface or groundwater due to structural failure; and a system where there is evidence of structural failure. The practice includes proper removal and disposal of wastes, liner materials, and saturated soil as well as shaping, filling, and seeding of the area.

**Milking Center Waste Control Systems.** A milking center waste control system is a piece of equipment, practice or combination of practices installed in a milking center for purposes of reducing the quantity or pollution potential of the wastes.

**Roofs for Barnyard Runoff Management and Manure Storage Facilities.** Roofs for barnyard runoff management and manure storage facilities are a roof and supporting structure constructed specifically to prevent rain and snow from contacting manure.

**Livestock Exclusion from Woodlots.** The exclusion of livestock from woodlots to protect the woodlots from grazing by fencing or other means.

**Cattle Mounds.** Cattle mounds are earthen mounds used in conjunction with feeding and dry lot operations and are intended to provide a dry and stable surface area for cattle.

**Structural Urban Best Management Practices.** Source area measures, transport systems and end-of-pipe measures designed to control storm water runoff rates, volumes and discharge quality. These practices will reduce the amount of pollutants carried in runoff and flows destructive to stream habitat. These measures include such practices as infiltration trenches, porous pavement, oil water separators, sediment chambers, sand filtration units, grassed swales, infiltration basins and detention/retention basins.

**Easements.** An easement is the purchase of a partial interest in property that conveys limited rights to the buyer. In general, nonpoint source easements are purchased along streambanks to provide vegetative cover. Easements are legally binding agreements, are recorded on the deed and run with the land.

## **Interim Best Management Practices**

Under some circumstances, practices may be recommended that are not included on the BMP list. Section NR 120.15 provides for alternative practices where necessary to meet the water resource objectives identified in the watershed plan. The Department may identify in the nonpoint source grant agreement the design criteria and standards and specifications where appropriate, cost share conditions, and cost share rates for each interim best management practice.

### ***Riparian Buffer Area BMP***

The purpose of riparian buffer areas in the Soft Maple and Hay Creek Watershed is to rehabilitate degraded streambank habitat located within the riparian corridor. The design objective is to establish a permanently vegetated area adjacent to streams, lakes or wetlands. Since many traditional practices for reducing cropland erosion may not apply in Rusk County, buffers areas adjacent to streams may be applied to reduce sediment delivery. Pasture management and streambank fencing will be required in conjunction with buffers in areas where over pasturing riparian areas have degraded stream habitat. Phosphorus, nitrogen and fecal coliform may also be reduced in conjunction with the reduction of sediment deposition.

The riparian buffer proposal is currently classified as an interim BMP. Upon the evaluation of the buffer practice proposal in another watershed project, NPS District Coordinator, with assistance from Rusk County LCD will develop an project eligibility strategy for buffers. Watershed staff with assistance from the watershed project team recommends that the practice will establish a minimum buffer width of 33 feet from perennial lakes and streams as well as a \$100.00/acre/year cost share rate for eligible landowners, for up to five years. According to the watershed landuse inventory, approximately 15 acres or 19,000 feet along pasture, cropland and grazed woodland would be eligible for the establishment of buffers. The following technical and administrative recommendations are to be followed upon development of the proposal:

#### **Conditions:**

Participants will be eligible if the watershed inventory designated the site as an eligible pasture, pastured woodland, cropland or farmstead.

Buffer areas must be kept fully vegetated for the minimum operation and maintenance period as stated in the cost share agreement.

Spot checks of buffer areas will be performed annually by watershed staff.

Areas established under any other program such as ACP or DNR easement will not be eligible for cost-sharing.

#### **Standards and Specifications:**

Riparian buffers will be 33' (2 rods) from the water's edge of perennial lakes and streams, or the centerline of intermittent streams, as delineated on a USGS 7.5 minute quadrangle.

Buffers must be maintained in either native vegetation or an NRCS approved grass mixture as specified in design plan.

No mechanical harvesting will be allowed on buffer areas. Restrained grazing will be allowed if stated in design plan.

No cost sharing or payments for conservation easement will be allowed on land receiving payments for vegetated riparian buffer practices.

### Cost Sharing:

Cost sharing will be provided at a rate of \$100/acre over a 5 year period. All cost share agreement provisions will be adhered to including repayment if the BMP is not maintained in accordance with design plan.

Shaping, grading, and the planting of perennial trees and grasses will be cost shared at a rate of 70%.

### **Practices Not Cost-Shared**

Practices not cost-shared, but which shall be included on the cost share agreement if necessary to control the nonpoint sources, are listed below (as listed in s. NR 120.17):

- That portion of a practice to be funded through other programs.
- Practices previously installed and necessary to support cost-shared practices.
- Changes in crop rotations.
- Changes in location of unconfined manure stacks involving no capital cost.
- Nonstationary manure spreading equipment.
- Practices needed for land use changes during the cost-share agreement period
- Other practices determined necessary to achieve the objectives of the watershed project.
- Minimum levels of street sweeping and leaf collecting.

### **Activities and Sources of Pollution Not Eligible For Cost Share Assistance**

Priority watershed cost-share funds cannot be used to control sources of pollution and land management activities specifically listed in s. NR 120.10(2). The following is a partial list of those ineligible activities:

- Operation and maintenance of cost-shared BMPs,
- Actions which have drainage of land or clearing of land as the primary objective,

- Practices already installed, with the exception of repairs to the practices which were rendered ineffective due to circumstances beyond the control of the landowner,
- Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) or covered in other ways by Chapter 147 of Wis. Stats. (including livestock operations with more than 1,000 animal units, or livestock operations issued a notice of discharge under ch. NR 243),
- Septic system controls or maintenance,
- Dredging activities,
- Silvicultural activities,
- Bulk storage of fertilizers and pesticides,
- Activities and structures intended primarily for flood control,
- Practices required to control sources that were adequately controlled at the time the cost-share agreement was signed, with the exception of those that occurred which were beyond the control of the landowner,
- Other practices or activities determined by DNR not to meet the objectives of the program.

## **Cost-Share Budget**

### ***Costs of Installing BMPs***

The quantity and type of management practices that are required to meet the water quality objectives of this project are listed in Table 5-3. The capital cost of installing the BMPs are listed for a 75 percent landowner participation rate. Units of measurement and cost per unit for the various BMPs are also included.

The capital cost of installing the BMPs is approximately \$2.041 million, assuming 100 percent participation. At 75 percent participation the capital cost is \$1.5 million.

- State funds necessary to cost-share this level of control would be approximately \$1.0 million.
- The local share provided by landowners and other cost-share recipients would be approximately \$500,000.

### ***Easement Costs***

Chapter Two identifies where nonpoint source program funds can be used to purchase easements. The estimated cost of purchasing easements on eligible lands in Rusk County is shown in Table 5-3. At 75 percent participation, the estimated purchase price of easements on eligible lands would be \$50,000. Easements are funded at the 100 percent level, and will be purchased by the State or local project sponsor.

### **Cost Containment**

#### ***Cost Containment Procedures***

Chapter NR 120 requires that cost containment procedures be identified in this plan to control the costs of installing BMPs. The cost containment procedure to be used by Rusk County is described below. The bidding procedure and average cost and flat rate lists can be obtained from the county LCD.

The rural management strategy stated in Chapter Two allows for maximum cost per practices based on level of pollution reduction provided by the practices. Eligible accessible and limited accessible streambanks sites must cost less than \$45.00 and \$50.00 per ton, respectively, controlled over the 10-year life of the practice. Eligible gullies must also meet the \$45.00 per ton controlled over the 10 life of the practice criteria. The cost containment criteria in the project management strategy will provide for maximum opportunity for Rusk County watershed staff to implement BMPs at the most efficient manner possible.

### **Cost-Share Agreement and Contact Strategy**

Money for cost share agreements is distributed by Rusk County from a Nonpoint Source Grant provided by the DNR. Rusk County receives additional grant money to support administrative responsibilities. Cost share agreements are binding contracts between landowners and Rusk County. Landowners must meet eligibility requirements defined in Chapter Two.

The following procedure will be used to make landowner contacts.

- All landowners or operators with eligible nonpoint sources will receive from the county a mailing explaining the project and how they can become involved.

- After the initial landowner mailings, county staff will make personal contacts with all landowners that have been identified as having critical nonpoint sources of pollution. These contacts will occur within the cost-share sign-up period.
- The county will continue to make contacts with eligible landowners and operators until they have made a definite decision regarding participation in the program.
- The county will contact all eligible landowners not signing cost-share agreements by personal letter six months prior to the end of the cost-share sign-up period.
- All critical sites not signing cost share agreements will be sent letters by the State notifying them of their critical site status.

### **Notification and Status of Critical Sites**

Landowners with sites meeting the criteria for critical sites are required, through s. 144.25, Stats., achieve the pollution reduction goal for their site(s) through the installation of BMPs or elimination of the source.

All critical sites will be verified by project staff. Verification includes confirming that the site continues to meet the criteria for critical sites and that the landowner has not signed a cost-share agreement. The verification process will begin within the first six months after the plan has been approved by the DNR. As part of the verification process, project staff shall inventory any additional lands in the watershed which were not inventoried previously and are under the same ownership as the sites which meet the critical sites criteria. These findings shall be reported in writing to the DNR.

Within 60 days after the verification findings of a critical site have been completed and the site continues to meet the criteria for critical sites, notification of the status will be sent by certified mail to the landowner by project staff or the DNR. This process will start with the highest ranked critical sites and proceed to the lowest ranked critical sites for each nonpoint source category. The notification process will continue for five years or until all landowners and/or land operators with critical sites have been notified.

The notification sent to a landowner with a critical site will include the following information:

- The dates indicating the beginning and end of the 36-month period of cost-share availability.
- The consequence of cost-share level reductions of 50 percent after the 36-month period has passed.

- The potential consequences of s. 144.025(2)(u), (v) or (w), Stats. that the landowner may face if no action is taken within 36 months after receipt of notification and the site continues to meet the critical site criteria. Those potential consequences are:
  - All site information will be turned over to the DNR for processing.
  - The DNR may prepare a notice of intent to issue the order to abate pollution caused by nonpoint sources. The notice of intent shall include the expected date of pollution abatement.
  - Failure to implement corrective measures as outlined in the notice of intent by the date identified in the notice, the DNR will issue orders to abate the nonpoint source pollution.
  - The right to appeal the designation as a critical site through a written request to the County Land Conservation Committee (LCC). This request must be received within 60 days of the receipt of the notification letter.

### **Critical Site Designation Appeals Process**

The owner or operator of a site designated as a critical site may appeal the critical site designation to the County Land Conservation Committee. The appeal shall be in writing. The written appeal must be received within 60 days of the landowner's receipt of the notification letter. The LCC shall:

- Provide the appellant with a hearing and give reasonable notice of the hearing to the appellant, DNR and DATCP.
- The hearing shall be conducted informally and be held in a place convenient to the appellant.
- Within 60 days of the hearing, the DNR and DATCP may submit a report and recommendation to the LCC concerning the hearing.
- The LCC may affirm or reverse the designation of the site as a critical site. The LCC shall limit its appeal consideration to whether the critical site designation is consistent with critical site criteria established in the watershed plan. The LCC shall consider whether governmental representatives erred in their verification of the site conditions or management. Loss of profit or pecuniary hardship is not grounds for affirmation of an appeal. Violations by or appeals granted to other appellants shall not justify affirmation of an appeal.

- Following the hearing, the LCC shall render a decision in writing within 45 days of receiving the DNR and DATCP recommendations/reports, or within the conclusion of the 60 day DNR and DATCP recommendation/report period.

The owner or operator of a site designated as a critical site may obtain a review of the decision of the LCC by filing a written request with the Land and Water Conservation Board within 60 days after receiving the decision of the LCC.

The owner or operator of a site designated as a critical site may request a contested case hearing under chapter 227, Stats., the decision of the Land and Water Conservation Board by filing a written request with the DNR within 60 days after receiving an adverse decision of the Land and Water Conservation Board.

The project staff shall postpone notification to any landowner who signs a cost-share agreement and continues to comply with the implementation schedules described in the cost-share agreement as per s. NR 120.13(4)(d).

A site is no longer considered a critical site if the site fails to meet the criteria for a critical sites designation or the site has had BMPs implemented in accordance with a cost-share agreement. In accordance with s.133.025(2)(u), (v), and (w), Stats., the lead management agency and/or the DNR may issue a Notice of Intent (NOI) to the landowner of a site who fails to install the needed BMPs to reduce the level of pollution to an acceptable level.

### **Eligible Landowner Contact Strategy**

The following procedure will be used to make landowner contacts for eligible sources.

- During the first three months of the implementation period, all landowners or operators with eligible nonpoint sources will receive a mailing from the lead management agency explaining the project and how participants can become involved voluntarily.
- After the initial landowner mailings, lead management agency staff will make personal contacts with all landowners that have been identified as having eligible nonpoint sources of pollution.
- The lead management agency will continue to make contacts with eligible landowners and operators until they have made a definite decision regarding participation in the program.



- The lead management agency will contact all eligible landowners not signing cost-share agreements, by personal letter, six months prior to the end of the five year cost share sign-up phase.

## **Budget and Staffing Needs**

This section estimates the funding and staffing required to provide technical assistance for the rural portion of this project.

### ***Staff Needs and Costs***

Table 5-4 lists the total estimated staff needed to implement the project assuming a 75 percent level of participation by eligible landowners. A total of approximately 56,700 staff hours (3.5 positions) are required to implement this plan. This includes 1,600 staff hours to carry out the information and education program. Currently, 2.5 positions are being funded on the Soft Maple and Hay Creek watershed project staff. Rusk County and agencies will determine the need for additional staff based on the annual workload analysis.

The estimated cost for 3.5 staff positions at the 75 percent participation rate (see table 5-5) is approximately \$867,000. These costs will be paid by the state through the Local Assistance Grant Agreement.

**Table 5-3. Cost-Share Budget Needs for Management Practices in Rusk County**

Best Management Practices	Number	Cost/unit (\$)	Total Cost	75 % Participation	
				State Share	Local Share
Upland Control					
Change in Crop Rotation	1,000 ac	NA	0	0	(1)
Contour Cropping	100 ac	9	900	473	68
High Residue Management	100 ac	18.5	1,850	971	139
Cropland Protection Cover (Green Manure)	50 ac	25	1,250	656	94
Intensive Grazing Management (Rotational Grazing)	3 ea	4,000	12,000	4,500	4,500
Critical Area Stabilization	25 ac	800	20,000	10,500	4,500
Grass Waterways	15 ac	3,000	45,000	23,625	10,125
Field Diversions and Terraces	400 ft	3	1,200	630	270
Grade Stabilization	5 ea	4,000	20,000	10,500	4,500
Agricultural Sediment Basin	1 ea	10,000	10,000	5,250	2,250
Shoreline Buffers	20 ac	400	8,000	4,200	1,800
Nutrient Management <sup>2</sup>	9,000 ac	6	54,000	20,250	20,250
Nutrient and Pest Management <sup>2</sup>	300 ac	10	3,000	1,125	1,125
Spill Control Basin	1 ea	15,000	15,000	7,875	3,375
Wetland Restoration	12 ea	2,000	24,000	12,600	5,400
Livestock Exclusion, Woods	5,000 ft	1	5,000	1,875	1,875
Barnyard Runoff Control					
Complete System	36 ea	25,000	900,000	472,500	202,500
Roof Gutters	3 ea	1,500	4,500	2,363	1,013
Clean Water Diversion	5 ea	2,500	12,500	6,563	2,813

Roofs	1 ea	25,000	25,000	13,125	5,625
Manure Storage Facility <sup>3</sup>	15 ea	40,000	600,000	270,000	180,000
Manure Storage Facility Abandonment	1 ea	10,000	10,000	5,250	2,250
Cattle Mounds	10 ea	3,000	30,000	15,750	6,750
Milking Center Waste Control	5 ea	7,000	35,000	18,375	7,875
<b>Streambank Erosion Control</b>					
Shape and Seeding	2,000 ft	10	20,000	10,500	4,500
Fencing	32,000 ft	1	32,000	16,800	7,200
Rock Riprap	1,000 ft	30	30,000	15,750	6,750
Bio-Bank Stabilization	250 ft	25	6,250	3,281	1,406
Crossing	15 ea	2,000	30,000	15,750	6,750
Remote Watering Systems	5 ea	2,000	10,000	5,250	750
Subtotal			1,991,450	989,487	502,152
Easements	50 ac	1,000	50,000	50,000	0
<b>TOTAL</b>			2,041,450	1,039,487	502,152

<sup>1</sup>Local share consists of labor and equipment costs. Also see flat rates in table 3-1.

<sup>2</sup> nutrient and Pest Management is cost shared per acre over a three year period. Number of acres shown represents three times the eligible acres.

<sup>3</sup> Maximum cost-share is \$35,000.

Source: Wisconsin DNR, DATCP, and Rusk County

**Table 5-4. Estimated Rusk County Staff Needs for 10 Years of Project Implementation**

Activity	Staff Hours (based on 75% participation)
Project and Financial Management	10,000
Information and Education Program	1,600
Pre-Contact Office Inventory; Landowner Contracts and Progress Tracking	3,200
Conservation Planning and Cost-Share Agreement Development	8,000
Plan Revisions and Monitoring	2,000
Practice Design and Installation	
Upland Sediment Control	4,000
Animal Waste Management	20,000
Streambank Erosion Control	6,000
Easements	300
Training	1,600
Total Rusk County Workload:	56,700
Estimated Staff Required per year	3.5
Hours	6,350

Source: DNR; DATCP and Rusk County

**Table 5-5. Total Project Costs at 75 percent Landowner Participation Rate**

Item	State share of Costs (75% participation)
Cost-Share Funds: Practices	\$1,272,365
Cost-Share Funds: Easements	\$50,000
Local Assistance Staff Support	\$866,765
Information/Education Direct	\$16,395
Other Direct (travel, supplies, etc.)	\$134,249
Engineering Assistance	\$1,320
<b>Total</b>	<b>2,341,094</b>

Source: DNR; DATCP, and the Rusk County Land Conservation Department

## **Implementation Schedule**

### ***Grant Award and Project Management Schedule***

Implementation of this Priority Watershed project shall begin upon both approval of this plan and receipt of the Nonpoint Source grant. The plan must be approved by the Department of Natural Resources (DNR), the Rusk County Board, and the Wisconsin Land and Water Conservation Board.

The project implementation period is ten years. During the first five years of implementation, cost-share agreements with eligible landowners may be signed. This sign-up period may be extended for two years if an evaluation, conducted by the DNR, shows that an extension is warranted. Practices listed on any cost-sharing agreement must be installed before the end of the implementation phase. The implementation phase of this project is scheduled to conclude in 2006.

The initial Nonpoint Source grant will cover the cost of practices over the entire ten year implementation phase. The amount of the Nonpoint Source grant is calculated as 75 percent participation by eligible landowners; see Table 5-3 for a detailed explanation. This grant may be amended due to changes needed for time of performance, funding levels, or scope of work.

Local Assistance grants will be awarded annually to Rusk County to cover the costs of personnel, operating expenses, and equipment. The DNR will evaluate a workload analysis and grant application submitted by Rusk County.

### **Total Project Cost**

The total state funding required to meet the rural nonpoint source pollution control needs at 75 percent level of landowner participation is presented in Table 5-3. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated costs to the state are \$2.32 million (for 75% participation). The sum of estimated cost to landowners and others is \$.45 million.

This cost estimate is based on projections developed by the agency planners and local staff. Historically, the actual expenditures for projects are less than the estimated costs. The factors affecting expenditures for this watershed project include: the amount of cost sharing that is actually expended; the number of staff working on the project; and the amount of support costs.

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# **CHAPTER SIX**

## **Integrated Resource Management Program**

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### **Introduction**

The purpose of this chapter is to identify existing state, federal and local resource management programs which provide benefits for water quality and/or fish and wildlife resources in the Soft Maple and Hay Creek Priority Watershed. Watershed staff will work to coordinate the efforts of these programs to provide the best possible management of land and water resources in the watershed. This comprehensive approach will facilitate consideration of the various goals and objectives for all the programs in which the landowner participates. Each of these activities is described below.

### **Fisheries and Wildlife Management**

The Soft Maple Priority Watershed fisheries survey was completed in 1995 and consists of community structure analysis to recommend subwatershed priorities and biological performance standards for future mitigation activities. The following are the management recommendations stated in the watershed fishery survey report. Contact Frank Pratt, DNR - Hayward Fish Manager @ (715) 634-2688 for more information.

The fisheries project goal is to improve the fish community structure integrity to restore Becky and Soft Maple streams. The fisheries objective is to reduce the tolerate species component to less than 60 percent and increase the sensitive species component to greater than 10 percent of the total fish community by the year 2005. The other top objectives from the watershed fisheries survey that are relevant to the watershed program include:

1. Strict adherence to Forestry Best Management Practices on county forest and private parcels to protect headwaters from erosion, turbidity, and increased sediment bed-load from poor forest road siting and construction.
2. A county construction/maintenance ordinance adopting a BMP based on the best available erosion and runoff control techniques.
3. Protection of the headwaters section of Becky Creek.
4. Conduct an in-depth physical inventory to identify ground water inputs and deficits in the Alder Creek system.

### ***Design Specifications that Should be Addressed to Improve Fishery Habitat***

Watershed best management practices (BMPs) such as streambank protection, streambank and shoreline buffer strips, and easements should be implemented in a manner that preserves and enhances the management goal of providing a quality fishery in the Soft Maple and Hay Creek Priority Watershed.

All streambank protection BMPs should be installed using large diameter-sized rock below the water line.

Rock riprap should be installed and sized so that the placement and size of rock will positively benefit fish habitat.

Vegetative shoreline erosion control using emergent aquatic vegetation for habitat enhancement should be used where applicable.

Wildlife habitat components should also be incorporated into vegetative filter strips along streams or in upland areas.

The Chippewa River has been subject to increasing and on-going investigation as part of the FERC hydropower relicensing process. The Soft Maple and Hay Creek Watershed research site on the Chippewa will figure prominently in Research's regulated flow study in 1996-98. The annual Rusk County school program at the Trails End Camp provides an ongoing opportunity to monitor the fish community in backwater lagoons of the Chippewa River.

Streambank and shoreline erosion control measures, such as lunger structures, will be installed in a manner beneficial to fisheries and wildlife habitat. DNR Fish Management and Wildlife Management personnel (see below) will be consulted for input in the design of streambank and shoreline protection BMPs to maximize benefits to the fish and wildlife communities. In cooperation with Rusk County, DNR staff will also review placement of agricultural sediment basins, provide technical assistance when the installation of BMPs require the removal of obstructions or other wildlife habitat by proposing measures to minimize impact on wildlife habitat, and assist in resolving questions concerning effects of agricultural nonpoint source BMPs on wetlands.

Frank Pratt	Frank Vanecek
Hayward WDNR	W8945 Hwy. 8
Fishery Manager	DNR Ranger Station
	Ladysmith, WI 54848

### **Wetland Restoration**

Significant amounts of restorable wetlands have not been identified in the watershed. Wetlands are an important part of the hydrology in the Soft Maple and Hay Creek Priority Watershed. Over 18 percent of the overall land area in the watershed is classified as wetland. By identifying, classifying and implementing existing state and federal wetland



protection programs, this project can maintain the quantity of wetland areas. The general guidelines for wetland restoration, easement acquisition and streambank buffers to protect existing wetlands will be followed. Wetlands that are important wildlife habitats will be identified in consultation with DNR Wildlife Management and Watershed Management personnel.

Streambank buffer easements may be acquired next to these wetlands to offer better protection from sedimentation and other nonpoint source pollution.

Some of the relevant wetland protection standards that may apply to watershed wetland protection practices are:

Chapter NR 103 - Water Quality Standards For Wetlands  
Shoreland - Wetland Zoning: Chapters NR 115 and NR 117  
Chapter 404 federal permits may be required for the discharge of dredge or fill in waters of the State.

Potential wetland rehabilitation programs include :

Soft Maple and Hay Creek Priority Watershed Project  
USDA - NRCS Wetland Reserve Program  
USDA - NRCS Waterbank Program  
USDA - FSA Conservation Reserve Program  
USDA - FSA Agriculture Conservation Program  
US Fish and Wildlife Service  
DNR Wildlife Management Programs

The watershed classification 1: 24,000 quadrangles cover completed by DNR BIM/GEO for this watershed will be used by watershed staff to identify potential sites for wetland restoration projects. Special attention for identification wetland protection projects will be focused on the Alder Creek Subwatershed. A project objective will be to achieve a 25 percent increase in total wetland acreage within the Alder Creek Subwatershed.

Additional information on wetland restoration and protection programs can be obtained from the wildlife managers and wetlands specialists listed below:

Frank Vanecek  
WDNR Ranger Station  
W8945 Hwy. 8

Sue Jones- WT/6  
101 S. Webster  
Madison, WI 53707

Bill Gantz  
Environmental Review  
Coordinator  
DNR NOR, Box 309  
Spooner, WI 54801

Pat Trochlell- WT/2  
101 S. Webster  
Madison, WI 53707

## **Groundwater Management**

Wells provide direct conduits for pollutants to reach groundwater resources. Preventing well contamination and sealing abandoned wells are important steps for protecting these resources. If not properly sealed, abandoned wells can directly channel contaminated surface water or shallow groundwater into deeper drinking water aquifers, bypassing the normal purifying action that takes place as surface water slowly percolates downward.

Excessive manure and fertilizer applications can be reduced through the development and implementation of nutrient and pest management plans (Standards 590/595). Nutrient management planning through watershed staff or private consultants can reduce nitrate leaching and runoff by crediting natural fertilizer contribution from crop residues and manure. Any nutrient applications to be made should not exceed the expected crop needs. Nutrient management plans also identify sites especially sensitive to environmental hazards that need specific management to reduce risks of nutrient movement.

## **Well Abandonment**

Soft Maple and Hay Creek Priority Watershed farm operators should properly seal abandoned wells to protect groundwater resources. Well abandonment is currently not an eligible cost-share practice under ch. NR 120, however, the proposed Phase 2 of ch. NR 120 does include well abandonment as an eligible BMP. Rusk County LCD will encourage all landowners to properly seal abandoned wells. Information on the proper abandonment procedures will be provided to landowners when abandoned wells are located. Well abandonment field days are part of the watershed's Information and Education strategy. Field days allow watershed residents to participate in installation of some management practice and learn the principles of groundwater contamination and hydrology.

## **Wisconsin Well Compensation Grants**

Wisconsin's Well Compensation grant program provides financial assistance to replace or treat private wells contaminated with heavy metals, pesticides, solvents or gasoline. Wells must comply with state or federal drinking water standards. Replacement of wells contaminated with bacteria or nitrate are not eligible for cost-sharing, with the exception of livestock wells contaminated with more than 40 ppm of nitrate. DNR district water supply personnel should be consulted for more information concerning income limits and other eligibility requirements. Eligible landowners will be encouraged to apply for well replacement funds through the Wisconsin Well Compensation Grant Program.

## **Fuel Storage Tanks**

Leaking fuel storage tanks can be a source of contamination for both groundwater and surface water. Description of programs funding removal and remediation of Underground Storage Tanks can be obtained from:

Department of Natural Resources  
PO Box 309  
Spooner, WI 54801  
(715) 635-2101

## **Private Sewage System Maintenance and Rehabilitation**

Poorly sited or improperly functioning private sewage systems have the potential to contaminate groundwater and surface waters in the Soft Maple and Hay Creek Priority Watershed. Pollutants from sewage system discharge includes bacteria, viruses, household chemicals, nitrates and phosphorus. Many sewage systems located in riparian areas are outdated and installed in soils that do not adequately filter pollutants due to the poor filtering ability of the soil and/or a high water table. Failing sewage systems in riparian areas are a special concern since pollutants can enter the surface waters with minimal filtering. Sewage system failure is often due to poor maintenance, primarily a failure to empty septic tanks on a regular basis.

Rusk County staff will prepare educational materials to promote the proper maintenance of private sewage systems. Sewage system maintenance and household tips to reduce groundwater contamination will be stressed during field visits and home environmental audits.

## **Wisconsin Fund**

The Private Sewage System Replacement & Rehabilitation Grant Program (Wisconsin Fund) provides financial incentives to protect and improve groundwater quality in Wisconsin. The Wisconsin Fund provides funds to update private sewage systems installed before 1978. To be eligible the septic system must have been inspected by the Rusk County Zoning Administrator and determined to be failing by discharging waste to the groundwater or surface water. Only permanent residences qualify, and there are income restrictions. Applications for Wisconsin Fund assistance are made through the Rusk County Zoning Department. They can be contacted at:

Rusk County Zoning Administrator  
Rusk County Courthouse  
311 E. Miner Ave.  
Ladysmith, WI 54848

## **Riparian Zones**

Cattle access to streams has been identified as a serious problem in the watershed. Trampled streambank sites impacted by cattle access that have been identified as part of the streambank inventory during the planning phase of the project should be protected with BMPs. The watershed has established a 75 percent reduction objective for trampled riparian areas. Those riparian areas trampled from excessive cattle access located in the Becky Creek Subwatershed will be required to install fencing to protect habitat. Sensitive riparian areas can be acquired through easements so they receive lasting protection. Rusk County staff will promote the protection of riparian areas where possible.

## **Forestry Programs**

Private forest lands, which account for over 57,120 acres (51% of land area) within the Soft Maple and Hay Creek Priority Watershed, are important producers of forest products in Rusk County. For information on the forestry erosion watershed management strategy see Chapter Two. When possible, forestry erosion BMPs should be implemented in conjunction with existing soils and water resource forestry protection programs.

Private forest lands also contribute to the quality of water resources and fish and wildlife resources in the watershed. Financial assistance is available for forest management and soil and water resource protection through the Stewardship Incentive Program (SIP), and other forest stewardship programs. Additional information can be found in DNR publication FR-093-95, Wisconsin Forestry Best Management Practices For Water Quality, developed by the DNR Bureau of Forestry.

### ***Stewardship Incentive Program***

The Stewardship Incentive Program (SIP) was developed to stimulate enhanced management of forest lands by cost-sharing approved management practices. SIP provides cost share funding of up to 75 percent for practices that provide soil and water protection. The SIP program applies to non-industrial private forest land of 10 acres and on forested or forest related (i.e., prairie, wetlands) lands. Practices that are cost-shared by SIP include: development of a landowner forest stewardship plan; site preparation and tree planting; timber stand improvement; windbreak and hedgerow establishment; soil and water protection and improvement; riparian and wetland protection and improvement; fisheries habitat enhancement; wildlife habitat enhancement; and forest recreation enhancement.

### ***Managed Forest Law***

The goal of the Managed Forest Law (MFL) program is to encourage long-term sound forest management. MFL is a tax incentive program for industrial and nonindustrial private woodland owners who manage their woodlands for forest products while also managing for water quality protection, wildlife habitat and recreation. In return for following an approved management plan, property taxes are set at a lower rate than normal. At a later time when the landowner receives an income from a timber harvest, some of the deferred tax is collected in the form of a yield tax. Management plans are based on the landowners objectives. These plans may address harvesting, planting, thinning, and soil erosion on a mandatory basis while addressing other practices such as wildlife and aesthetic activities on a voluntary basis. An estimated 3,168 acres within the watershed are enrolled in this program.

### ***Forest Crop Law***

The Forest Crop Law (FCL) is another forest management tax incentive program. The program is no longer open for new entries, however, contracts for approximately 4,520 acres exist on FCL lands within the watershed. These contracts will be honored for their duration. The Forest Crop Law encourages a policy to protect forest growth from destructive or premature cutting through the implementation of sound forestry practices.

### ***Other Stewardship Programs***

Another forest stewardship program available to watershed landowners is the Agricultural Conservation Program (ACP). This Program provides funding for conservation practices similar to those offered in the Stewardship Incentive Program. Management plan preparation and recreation enhancement practices are not included in the ACP.

Rusk County LCD staff and DNR foresters will encourage eligible forest landowners in the Soft Maple and Hay Creek Priority Watershed to participate in Forest Stewardship Programs to benefit water resources and forest habitat. Protection of soil and water resources should be addressed in all SIP and MFL plans where applicable.

Dennis Hohlfelder and Wayne Tappon  
Rusk County DNR Foresters  
WDNR Ranger Station  
W8945 Hwy. 8  
Ladysmith, WI 54848

## **Coordinating Regulations, Permits, and Zoning**

Best management practices that address streambank/shoreline erosion such as riprap or vegetative shoreline stabilization will require permits from the DNR. Any BMP which affects wetland form or function may require permits from the DNR, Rusk County Zoning office and the US Army Corps of Engineers.

The Rusk County Land Conservation Department will work closely with the DNR Water Regulation and Zoning staff, the Rusk County Zoning Department and the US Army Corps of Engineers to assure that necessary permits are received prior to the installation of streambank/shoreline stabilization practices.

In an attempt to protect the use, enjoyment and water quality of our lakes and streams the state, federal and local government regulates some activities on riparian properties. Activities that disturb or remove the natural vegetation surrounding our lakes and streams reduces the buffering capacity of the area and often drastically increases erosion, sedimentation and nutrient runoff. Many lakefront property owners, particularly those who are purchasing waterfront property for the first time, are not aware of these regulations or the need for them.

Rusk County will work in cooperation with the Property Listing Department, Zoning Department and the DNR to provide information packets to Amacoy Lake waterfront property owners. The focus of the packet will be to educate residents about the existence of zoning regulations, lakefront vegetation, landowner stormwater management and lakeside lawncare and other steps the landowners can take to become responsible lake stewards.

## **Timberline Trail Landfill**

The Timberline Trail Landfill site is located in section 4, township 34 North, range 8 West in Rusk County. The landfill started construction shortly after the inventory portion of the watershed program had begun. The landfill has been cited twice by the Department of Natural Resources for failure to follow surface wastewater discharge prohibitions. It is not within the scope of the Nonpoint Source program to cost-share with landfills, however, Watershed staff have been active in seeking a solution to the wastewater problems experienced by Timberline Trail. Technical assistance, agronomic advice and all water quality data collected by watershed staff will be available as a resource for Timberline Trail Environmental Managers.

Timberline Trail has been active in attempting to allow more landowners to participate in the watershed project by beginning a cost sharing project used in conjunction with nonpoint source watershed funds. Specific details of this program are not available at this time, but

landowners will be made aware of any potential funding or cost sharing provide by Timberline Trail.

### **Coordination With State and Federal Conservation Compliance Programs**

The Watershed Project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by DATCP, and the Federal Food Security Act (FSA) administered by the Natural Resource Conservation Service (NRCS). DATCP will assist the LCD and the NRCS offices to identify landowners within the watershed that are subject to the compliance provisions of FPP and FSA. Conservation Farm Plans were completed for all landowners in FSA by December 31, 1989. There are 5000 acres and 20 landowners active in FPP planning and approximately 11,000 acres in FSA planning within the watershed project.

Implementation and amendment of these conservation plans will be necessary during the implementation phase of the watershed project. Watershed project staff will inform FPP and NRCS staff of changes in plans resulting from management decisions and the installation of needed BMPs for nonpoint source pollution abatement.

### **Archaeological Sites: Coordination with State and Federal Historic Preservation Laws**

There are two known archaeological sites within the Soft Maple and Hay Creek Watershed. The known sites are prehistoric villages and sites, and a historic home. It would appear that most are not in areas that will be affected by watershed project activities. Generally, most watershed activities will take place in areas that have been disturbed by recent human settlement patterns. Some examples include roads, bridges, housing, farm buildings, cultivated fields, dams, forestry activities and other development. Settling basins, manure storage structures, and streambank or shoreline shaping and riprapping are likely practices that may disturb archaeological sites. State and federal laws require preservation of archaeological resources within the framework of the NPS Program.

Before finalizing the cost-share agreement with the landowner, Rusk County project staff should review the maps showing known archaeological and historic sites. If a known site occurs near a proposed BMP, this does not necessarily mean the BMP needs to be moved or altered. In some cases, the specific location of the BMP will not be near enough to the location of the known site to warrant further review. Project staff should visit the area and conduct a "pre-review" to ensure that the specific location of the proposed BMP will not disturb the known archaeological or historic site. Instructions and Cultural Resource Site Review Documentation forms are available in the Implementation Manual.

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If it is too difficult to determine through a pre-review, or if it appears that the known site would indeed be disturbed, county staff should contact a certified professional to set up a formal Archaeological or Historic Site Review of the area. The DNR's Bureau of Facilities and Lands in Madison has a listing of certified personnel throughout the state to conduct such a survey. Any costs incurred as part of a site review will not be passed on to the landowner. The DNR's Nonpoint Source Pollution Abatement Program will pick up the costs of professional historic and/or archaeological site reviews. In some cases, a representative from the Natural Resources Conservation Service (NRCS) may conduct the review.

The survey will assess the potential of the BMP to significantly disturb the site. Alternative BMPs may need to be considered both before and after the results of the survey. A cost-share agreement is signed before the survey is conducted. In certain instances a survey may reveal a significant archaeological site which precludes the installation of a particular BMP at that site. Cost-share agreements should contain language that nullifies or partially nullifies the cost-share agreement based on the results of the archaeological survey.

## **Practices of Concern**

### ***Archaeological Sites***

Field Diversions	Terraces
Grade Stabilization Structures	Agricultural Sediment Basins
Wetland Restoration	Streambank and Shoreline Stabilization
Streambank Shaping or Riprap	Structural Urban Practices
Sediment Retention, Erosion or Water Control Structures	

### ***Historic Buildings***

Animal Lot Relocation	Barnyard Runoff Management Systems
Manure Storage Facilities	Roofs for Barnyard/Manure Storage
Raingutters	

Projects using state and federal funding, assistance, licenses and permits are required by law to consider the effects of their actions on archaeological and historical sites and historical structures. The watershed project is a joint cooperative effort between federal, state, and county agencies as well as the private landowners who volunteer to participate in the program. As a result, the federal Historic Preservation Act of 1966, as amended, and the state historic preservation statute, s. 44.40, Wis. Stats., have been blended to produce a cultural resource management program that is both compatible to preserving cultural sites and implementing the watershed project.

Previous cultures can be divided in the following times:



- \* The Paleo-Indian Period occurred about 10,000 years ago and included nomadic people who hunted large animals, used throwing spears with chipped stone points, and lived in small groups.
- \* The Archaic Period occurred about 3,000 years later when the climate became much dryer. The Archaic peoples used the chipped stone points and also used copper to make ornaments, fishhooks, harpoons and adzes. They also made dugout canoes and moved with the seasons making temporary camps.
- \* The Historic Period started in the mid-1600s when the explorers, missionaries and traders found the Ojibwa (Chippewa) moving into the area, displacing the Dakota. The Ojibwa used similar tools to those mentioned above and developed trading systems with other tribes as well as with Euro-Americans.

[Source: The Archaeology of Northwestern Wisconsin, Edgar S. Oerichbauer, Burnett County Historical Society.]

Some physical remnants of these previous cultures remain, and there are some documented sites within the watershed, according to Edgar S. Oerichbauer of the Burnett County Historical Society. Documented sites are found in the following general locations:

- \* In T33N-R8W sections 2, 3, and 11, prehistoric villages and sites.
- \* A historic home site on the north side of Highway 8 in Section 4, T34N-R7W in the town of Thornapple.

These areas will need special consideration when structural best management practices are being considered.

## **Endangered and Threatened Resources**

Information on threatened and endangered resources was obtained from the DNR's Bureau of Endangered Resources. Endangered resources include rare species and natural communities. It should be noted that comprehensive endangered resource surveys have not been completed for the entire Soft Maple and Hay Creek Priority Watershed. The lack of additional occurrence records does not preclude the possibility that other endangered resources are present in the watershed. In addition, the Bureau's endangered resource files are continuously updated from ongoing field work. There may be other records of rare species and natural communities that are in the process of being added to the database and so are not listed in this document.

### ***Rare Species***

Rare species are tracked by Wisconsin's Natural Heritage Inventory of the Bureau of Endangered Resources. Species tracked by the inventory include those that are listed by the U.S. Fish and Wildlife Service or by the state of Wisconsin.

### ***Wisconsin Endangered Species***

An endangered species is one whose continued existence as a viable component of this state's wild animals or wild plants is determined by the DNR to be in jeopardy on the basis of scientific evidence. Endangered species within the watershed are:

*Ophiogomphus anomalus*, Extra-striped Snaketail Dragonfly  
*Ophiogomphus howei*, Pygmy Snaketail Dragonfly

### ***Wisconsin Threatened Species***

A threatened species is one which, if not protected, has a strong probability of becoming endangered. Wisconsin threatened species within the watershed are:

*Percina evides*, Gilt Darter;  
*Moxostoma valenciennesi*, Greater Redhorse;  
*Haliaeetus leucocephalus*, bald eagle<sup>2</sup>;  
*Pandion haliaetus*, osprey;

### ***Wisconsin Special Concern Species***

A special concern species is one for which some problem of abundance or distribution is suspected in Wisconsin, but not yet proven. The purpose of this category is to focus attention on certain species before they become endangered or threatened. Wisconsin special concern species within the watershed are:

*Gomphurus lineatifrons*, Splendid Clubtail  
*Gomphurus ventricosus*, Skillet Clubtail  
*Gomphus quadricolor*, Rapids Clubtail  
*Hylogomphus viridifrons*, Green-Faced Clubtail  
*Ophiogomphus Sp 1*, St. Croix Snakefly

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<sup>2</sup>This species is also on the Federal Endangered Species list as Endangered. A federally Endangered species is any species or subspecies which is in danger of extinction throughout all or a significant portion of its range.

Neurocordulia yamaskanensis, Stygian Shadowfly  
Rana palustris, Pickerel Frog  
Bortrychium oneidense, Blunt - Lobed Grape Fern  
Bortrychium minganense, Mingan's Moonwort  
Etheostoma microperca, Least Darter  
Utricularia resupinata, Small Purple Bladderwort  
Thalictrum venulosum, Veined Meadow Rue

## Natural Areas

Natural areas are sites that contain high quality examples of natural communities. The following natural areas have been identified in the Soft Maple and Hay Creek Priority Watershed. The natural communities found at each area are also listed.

- \* Open Bog
- \* Northern Wet Forest
- \* Emergent Aquatic
- \* Northern Sedge Meadow
- \* Northern Dry Forest
- \* Lake- Hard Bog
- \* Lake- Soft Bog
- \* Alder Thicket
- \* Stream- Slow, Hard, Warm
- \* Springs and Spring Runs, Hard
- \* Stream- Slow, Hard, Cold
- \* Lake- Deep, Soft, Seepage
- \* Lake- Deep, Soft, Drainage
- \* Northern Wet- Mesic Forest

If specific location or other information is needed about these species or natural communities, contact the DNR Bureau of Endangered Resources. Please note that the specific location of endangered resources is sensitive information. Exact locations should not be released or reproduced in any publicly disseminated documents.

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# CHAPTER SEVEN

## Information and Education Activities

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This chapter outlines an Information and Education Program designed to assist watershed residents in adopting water quality best management practices (BMPs). The program is an adaptable guide that will be revisited and revised annually to meet the project's changing needs.

### Program Goal

Residents of the watershed will make decisions and take actions that protect surface and ground water quality in the Soft Maple and Hay Creek Watershed.

### Program Objectives

- 1) Agricultural producers will minimize nutrient, sediment, and other polluting runoff from farming activities.
- 2) Forest product producers will minimize nutrient, sediment, and other polluting runoff from forestry activities.
- 3) Shoreland residents will minimize phosphorus, sediment, and other polluting runoff from lakeshore property.
- 4) Village residents will minimize phosphorus, sediment, and other polluting runoff to stormwater systems.
- 5) Landowners will protect and, where possible, restore wetlands.
- 6) Watershed residents will understand the value of surface and ground water resources and how to preserve them.
- 7) Local government officials will make decisions that protect water quality.

For each objective identified above, the following are identified:

**Audience:** Groups or individuals that are be targeted for a given message.

**Message:** Key information to communicate to the target audience.

**Activities:** Ways used to get messages to target audiences and encourage action.

Activities will be selected and presented in an Annual Information and Education Plan. New activities may be included as needed to respond to changing needs of the program and the evaluation of past activities.

## **Program Implementation Team**

The Information and Education Program was developed by the Soft Maple and Hay Creek project team with assistance from the Citizens Advisory Committee, University of Wisconsin Extension, Department of Natural Resources, Rusk County Land Conservation Department, and the Rusk County Land Conservation Committee.

The Soft Maple and Hay Creek project staff will take lead responsibility for the implementation of the Information and Education Program. University of Wisconsin Cooperative Extension (UWEX), Department of Natural Resources (DNR), Rusk County Land Conservation Department (LCD), and Department of Agriculture, Trade and Consumer Protection (DATCP) staff will provide supporting assistance. The Soft Maple/Hay Creek project staff will work with, and seek support from, local units of government and organizations such as villages, towns, school districts, lake associations, and other community groups and businesses.

## Program Strategy

*Objective 1: Agricultural producers will minimize nutrient, sediment, and other polluting runoff from farming activities.*

<b>Audience:</b>	<u>Primary Group</u>	<u>Secondary Group</u>
	Farmers (operators)	Ag consultants (agronomists)
	Landowners	Cooperatives
		Implement dealers
		Bankers
		Seed salespersons
		FFA, VoAg (youth education)
		Cooperating agencies
		Farm Bureau

### Messages:

- Good water quality is important to everyone.
- Good neighbors protect water quality.
- Nutrient management planning can help you manage your farm efficiently.
- Best management practices (BMP's) keep soil and nutrients on your farm.
- BMP's help protect ground and surface water quality.
- Cost sharing is available to implement BMP's (emphasis year 1-5).
- BMP's require regular maintenance.
- Ground water quality problems are difficult to correct; prevention is key.
- Abandoned wells are a potential source of groundwater contamination.
- Preserving stream corridor and wetland habitat is important.

### Activities:

- One-on-one contacts (e.g., follow-up to nutrient management plans)
- Informational meetings
- Demonstration tours
- Presentations at farmers group meetings
- Watershed newsletter
- Articles for other newsletters (UW-Extension, Zoning, Rural Electric, lake organizations, cooperatives)
- News releases
- Recognition for farms that install best management practices
- Displays (e.g., Rusk County Fair, Farm Show, and other similar events)
- Nutrient Management Field Days
- Informational handouts for farm contacts
- On-farm nutrient management trials

**Objective 2:** *Forest product producers will minimize nutrient, sediment, and other polluting runoff from forestry activities.*

<b>Audience:</b>	<u>Primary Group</u>	<u>Secondary Group</u>
	Private forest owners	Forest land users
	Elected officials	Forestry equipment dealers
	Loggers	Forest product buyers (lumber pulp mills)

- Messages:**
- Good water quality is important to everyone.
  - Good neighbors protect water quality.
  - Forested land is the largest land use in the watershed.
  - Forestry management practices impact water quality.
  - Water quality best management practices (BMPs) are available for forestry management activities.

- Activities:**
- Presentations for county/state forestry staff and elected officials
  - Demonstration site tours of BMP practices
  - Recognition of forest owners/operators that protect water quality
  - One-on-one consultations

**Objective 3:** *Shoreland residents will minimize phosphorus, sediment, and other polluting runoff from lakeshore property.*

<b>Audience:</b>	<u>Primary Group</u>	<u>Secondary Group</u>
	Lakeshore residents	Builders and developers
	Lakeshore Associations	Zoning Board of Adjustment
	County Zoning Committee	Lawn and garden shops
		Plumbers and septic system services
		Dock installers

- Messages:**
- Good water quality is important to everyone.
  - Good neighbors protect water quality.
  - Maintain water quality for fish/water sports
  - Yard waste/pet waste should be managed properly.
  - Lawn fertilizer requirements are limited - don't over-fertilize.
  - Buffer strips of vegetation preserve water quality.
  - Septic systems require regular maintenance.
  - Excessive amounts of stormwater runoff causes problems.
  - Infiltration areas minimize run off.
  - Erosion from construction sites should be controlled.

- Activities:**
- Watershed newsletter
  - Articles in various associations and school newsletters
  - News releases
  - Workshops on lawn care, landscaping, and erosion control
  - Demonstration sites: landscaping and erosion control
  - Presentations at meetings
  - Certification/recognition for following practices
  - Door-to-door information distribution
  - Multi-County lake fairs
  - Construction site erosion control workshops
  - Building on Waterfront brochure

**Objective 4:** *Village residents will minimize phosphorus, sediment, and other polluting runoff from stormwater systems.*

**Audience:** Residents of Bruce and Weyerhaeuser  
Town and public officials

- Messages:**
- Good water quality is important to everyone.
  - Good neighbors protect water quality.
  - Stormwater drains run directly into the Chippewa River and its tributaries.
  - Fertilizer, anti-freeze, leaves, and grass in storm drains cause water quality problems.

- Activities:**
- Fact sheet - direct mail
  - News releases
  - School/volunteer group activity - storm drain stenciling
  - Watershed newsletter

**Objective 5:** *Landowners will protect and restore wetlands, where possible, in the watershed.*

**Audience:** Landowners with current or converted wetlands

- Messages:**
- Many wetlands in the watershed and across the country have been drained.
  - Farming wetlands generally isn't cost effective.
  - Wetlands protect water quality by trapping nutrients from run off.
  - Wetlands provide wildlife habitat.



- Buffer area around wetlands are beneficial to both wildlife and water quality.
- Money is available to cover the cost of restoring wetlands on your property (emphasis in years 1-5).
- Wetlands serve as flood control for downstream areas.

**Activities:**

- One-on-one contacts with landowners at inventoried sites
- Newsletter articles
- News releases
- Demonstration site tours
- Wetland visits/bird watching
- "User manual" for wetlands
- Displays (Multi-county lake fair and Farm Show)
- School group activities (teacher training to support)
- Presentations

**Objective 6:** *Watershed residents and visitors will understand the value of water resources and the importance of preserving them.*

**Audience:**

Absentee land owners  
Residents  
Visitors  
Elected officials  
School groups  
Science teachers  
Youth groups  
Resort/motel owners

**Messages:**

- Good water quality is important to everyone.
- Good neighbors protect water quality.
- We all have a role in keeping the water clean and protecting habitat.
- Acknowledge contributions of participants toward improved water quality.
- Clean water (especially groundwater) is important to health.
- Quality groundwater is key to the success of the local economy.
- There is an economic importance to preserving water resources.
- Maintain water quality important for fish/water sports.
- Cap unused wells to protect drinking water quality.

**Activities:**

- Multi-county lake fairs
- Watershed newsletter
- News releases
- Presentations
- Youth education (teacher training)

- Adopt-a-lake/adopt a stream
- Distribution of promotional materials (e.g., telephone book covers, placemats, shopping bags, etc.)

**Objective 7:** *Government officials will make positive changes to improve water quality.*

**Audience:** Elected officials  
County staff  
Public works employees (DNR, WDOT, County Forestry, County Highway and village/town employees)

**Messages:**

- Good water quality is important to everyone.
- Good neighbors protect water quality.
- Best management practice (BMP) standards are in place for highway/road construction and maintenance.
- Erosion from roads within the watershed is significant.
- Funding sources available for structural BMP's and stormwater planning.
- Clean streets mean clean water.
- Settling basins may be needed to clean stormwater.
- A construction site erosion control ordinance will help to maintain water quality in the area.
- Land use impacts water quality. Growth and development needs to consider water quality.

**Activities:**

- Meetings/presentations for with elected officials and staff
- Road maintenance workshop for town officials and staff

## **Program Evaluation**

An evaluation report of information and education activities will be prepared annually. Evaluation will be built into program activities where feasible. Activities may be evaluated through recording the number of attendees at a function, the number of target audience members reached, event surveys, or other methods. A survey will be used every two years to assess how watershed residents are getting information about the program, how effective the activities are at delivering messages, and where behavioral changes have occurred.

## Program Activity Schedule, Staff and Budget Needs

Information and education activities are designed to support the following project information and education objectives:

- Objective 1:** Agricultural producers will minimize nutrient, sediment and other polluting runoff.
- Objective 2:** Forestry producers will minimize nutrient, sediment and other polluting runoff.
- Objective 3:** Shoreland residents will minimize nutrient, sediment and other polluting runoff.
- Objective 4:** Village residents will minimize nutrient, sediment and other polluting runoff.
- Objective 5:** Landowners will protect and restore, when possible, watershed wetlands.
- Objective 6:** Watershed residents will understand the value of surface and ground water resources.
- Objective 7:** Local government officials will make decisions that protect water quality.

Activity	Schedule	Educational Objectives	Assignments (annual staff hours)	Indirect Costs (annual)	Direct Costs (annual)
One-on-one contacts with agricultural producers and owners of wetlands	On-going 1996-1999	1 and 5	500 - WPS		
Informational meeting to kick off project implementation	4/96	All	16 - WPS 4 - LCD 4 - UWEX/C 8 - UWEX/A	LCD/UWEX time - \$160	Food - \$25 Handouts - \$15 TOTAL - \$40

Agency Codes:

DNR = Department of Natural Resources  
FD = County Forestry Department  
NPM = Nutrient and Pesticide Management Program  
UWEX/A = UW-Extension Area  
WPS = Watershed Project Staff

DOT = Department of Transportation  
LCD = County Land Conservation Department  
UWEX/C = UW - Extension County  
UWEX/S = UW-Extension State

Activity	Schedule	Educational Objectives	Assignments (annual staff hours)	Indirect Costs (annual)	Direct Costs (annual)
Demonstration tours of agricultural BMP's and wetland protection	1 per year 1996 - 1999	1 and 5	24 - WPS 4 - LCD 4 - UWEX/C 8 UWEX/A	LCD/UWEX time - \$160	Food - \$25 Handouts - \$15 Signs - \$150 TOTAL - \$190
Project presentations at meetings of farm groups, lake associations, and government officials	6 per year 1996 - 1999	1, 3, 5, 7	24 - WPS		Handouts - \$15
Watershed newsletter	3 per year 1996-99 2 per year 2000 - 2003	All	(per issue) 8 - WPS 4 - UWEX/C 8 - UWEX/A	(per issue) UWEX staff time - \$80	(per issue) Printing - \$200 Photos - \$10 Mailing - \$330 TOTAL - \$540
Prepare articles for other newsletters read in the watershed	4 per year 1996 - 1999	All	16 - UWEX/C	UWEX staff time - \$320	
Write news releases for area press	4 per year 1996- 1999	All	16 - UWEX/C	UWEX staff time - \$320	
Recognition of project participants via signs and county board signed certificates	On-going 1996-2003	1, 2, 6	24 - WPS		150 signs - \$2,250 150 certificates - 150 TOTAL - \$2,400
Display board for public events	2 shows per yr. 1996 - 1999	All	24 - WPS 4 - UWEX/C	UWEX staff time - \$80	Update photos - \$100 Handouts - \$15 TOTAL - \$115

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LCD = County Land Conservation Department  
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UWEX/S = UW-Extension State

Activity	Schedule	Educational Objectives	Assignments (annual staff hours)	Indirect Costs (annual)	Direct Costs (annual)
Nutrient and Pesticide Management Field Days	1 plot in 1996	1	16 - WPS 24 - NPM 4 - UWEX/C	UWEX staff time - \$80	Food - \$25 Handouts - \$15 TOTAL - \$40
Agricultural information packet update	annual update	1	8 - WPS		Handouts - \$15
On-farm nutrient and pesticide management trial plots	8 per year 1996 - 2001	1	64 - UWEX/C 8 - NPM	UWEX time - \$1,280	Covered by cost-sharing
Forestry BMP information meeting	1 meeting 1996	2	8 - WPS 8 - FD	FD staff time - \$160	Food - \$25 Handouts - \$15 TOTAL - \$40
Forestry BMP demonstration tour	1 tour 1997	2	32 - WPS 16 - FD	FD staff time - \$320	Food - \$25 Handouts - \$15 TOTAL - \$40
One-on-one consultation with forest products producers	On-going 1996 - 1999	2	80 - WPS 20 - FD	FD staff time - \$400	
Lawn care BMP workshop with information on enhancing wildlife habitat	1 per year for 1997 and 1999	3	40 UWEX/C	UWEX staff time - \$800	Food - \$25 Handouts - \$15 TOTAL - \$40
Shoreland management demonstration	1 in 1998	3	40 - UWEX/C 40 - UWEX/S	UWEX time - \$1,600	Food - \$25 Handouts - \$15 TOTAL - \$40

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DOT = Department of Transportation  
LCD = County Land Conservation Department  
UWEX/C = UW - Extension County  
UWEX/S = UW-Extension State

Activity	Schedule	Educational Objectives	Assignments (annual staff hours)	Indirect Costs (annual)	Direct Costs (annual)
Shoreland property owner Lake Friendly recognition plaque	On-going starting in 1998	3	16 - WPS		80 plaques - \$800
Kid on bike door-to-door shoreline information distribution	1997	3	8 - WPS 8 - UWEX/C 8 - UWEX/A 8 - LCD	LCD/UWEX time - \$320	Contract Worker - \$1,000 Handouts - \$50 TOTAL \$1,050
Multi-County Lake Fair	1996, 1998, 2000, 2002	3	24 - UWEX/C 8 - WPS	UWEX staff time - \$480	Handouts - \$15
Informational handouts for builders on county codes and regulations	1996	3	24 - UWEX/C	UWEX staff time - \$480	Printing - \$50
Building code up-date meeting with erosion control focus	1997	3	16 - UWEX/C 8 - UWEX/A 16 - Zoning/C	UWEX/Zoning time - \$640	Food - \$25 Handouts - \$15 TOTAL - \$40
Building on Shoreland publication	1996	3	16 - UWEX/C 16 - UWEX/A	UWEX staff time - \$320	Printing - \$50
Wetland owners manual publication	1997	5	16 - UWEX/C 16 - UWEX/A	UWEX staff time - \$320	Printing - \$50

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WPS = Watershed Project Staff

DOT = Department of Transportation  
LCD = County Land Conservation Department  
UWEX/C = UW - Extension County  
UWEX/S = UW-Extension State

Activity	Schedule	Educational Objectives	Assignments (annual staff hours)	Indirect Costs (annual)	Direct Costs (annual)
Urban water quality fact sheet distribution	1997	4	8 - UWEX/C 8 - UWEX/A 4 - WPS	UWEX staff time - \$160	Postage - \$120
Volunteer Activities, e.g., Storm Drain Stenciling	1997	4	8 - UWEX/C 8 - WPS	UWEX staff time - \$160	Paint - \$60
Visit to wetlands with decision makers and teachers	2000	5	8 - DNR 8 - WPS 8 - UWEX/C	DNR/UWEX time - \$320	Food - \$25 Handouts - \$15 TOTAL - \$40
Promotional materials, e.g., water quality messages on shopping bags, placemats, telephone book covers, etc.	1997 - 2000	6	16 - WPS 16 - UWEX/A		Printing - \$200
Erosion control workshops with town road crews	1996	7	16 - WPS 16 - UWEX/A 4 - UWEX/C 16 - DOT	DOT/UWEX time - \$400	Food - \$250 Handouts - \$15 TOTAL - \$265
School group activities	1997	5 and 6	8 - UWEX/C 16 - UWEX/S 16 - WPS	UWEX/S - \$480	Bus - \$300
TOTALS	NA	NA	1500	\$9,840.00	\$6,555.00

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# **CHAPTER EIGHT**

## **Project Evaluation**

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This chapter briefly summarizes the plan for monitoring the progress and evaluating the effectiveness of the Soft Maple and Hay Creek Priority Watershed Project. The evaluation strategy includes these components:

- Administrative review
- Pollution reduction evaluation
- Watershed Resource Evaluation Monitoring

Information on these components will be collected by the Rusk County LCD and reported on a regular basis to the DNR and the DATCP. Additional information on the numbers and types of practices on cost-share agreements, funds encumbered on cost-share agreements, and funds expended will be provided by the DNR's Division of Customer Assistance and External Relations. The Watershed Resource Evaluation Monitoring follows guidance established by DNR's Bureau of Watershed Management to select and monitor specific sites in the watershed to monitor resources quality changes.

A final report will be prepared for the Soft Maple and Hay Creek Priority Watershed Project within 18 months of the end of the grant period. This report will include information on landowner participation, project management, grant management, technical assistance, and any signs of success (SOS) sites completed within the watershed among other topics. The final report is developed to evaluate progress, provide documentation on attainment of water quality and pollutant load reduction objectives, evaluate BMP effectiveness, and provide recommendations which target key areas needing improvement in the NPS program. The DNR, with assistance from DATCP and the Rusk County LCD, will prepare the final report.

### **Administrative Review**

The first component, administrative review, will focus on the progress of Rusk County and other units of government in implementing the project. The project will be evaluated with respect to accomplishments, financial expenditures, and staff time spent on project activities.



### ***Accomplishment Reporting***

The Field Offices Computing System (FOCS) is a computer data management system that has been developed by the Natural Resources Conservation Service (NRCS). The NRCS, the DNR and the DATCP use FOCS to meet the accomplishment reporting requirements of all three agencies. Rusk County LCD will use FOCS to collect data for administrative accomplishments, and will provide the information to the DNR and the DATCP for program evaluation.

Accomplishment data are summarized in the Annual Accomplishment Report prepared by DATCP and DNR, and are also discussed at annual watershed review meetings. The length of sign-up period and implementation phase may also be discussed as part of the annual watershed review process. The Rusk County LCD will provide the following data to the DNR and the DATCP:

- Number of farms and acres in the project having conservation plans
- Number and type of conservation practices/BMPs installed by project
- Number of farms and acres of cropland monitored for program compliance
- Number of personal contacts made with landowners
- Progress on notification of critical site landowners
- Completed information and education activities
- Number of cost-share agreements signed
- Number of farm conservation plans and cost-share agreement status reviews completed

Details of the reporting requirements are contained in DNR Publication WR-223-94, which is reviewed every two years by DATCP and DNR and revised as necessary.

### ***Financial Expenditures***

Rusk County LCD will provide the following financial data to the DNR and the DATCP on a quarterly basis:

- Number of landowner cost-share agreements signed
- Amount of money encumbered in cost-share agreements
- Number of landowner reimbursement payments made for the installation of best management practices (BMPs), and the amount of money paid
- Staff travel expenditures
- Information and education expenditures
- Expenditures for equipment, materials, and supplies
- Expenditures for professional services and staff support costs

[CONTINUED ON NEXT PAGE]

- Total project expenditures for the watershed staff
- Amount of money paid for installation of BMPs, and money encumbered in cost-share agreements

The Rusk County LCD will also provide the DNR with the following financial data on an annual basis:

- Staff training expenditures
- Interest money earned and expended
- Total budget and expenditures on the project

The Rusk County LCD will provide time summaries to both departments for project activities on an annual basis.

### **Nonpoint Source Pollutant Load Reduction**

The purpose of the second evaluation component, pollutant load reduction, is to estimate reductions in nonpoint source pollutants as a result of installing BMPs and other management actions. Key sources were identified for estimating changes in pollutant loads that reach surface waters in the Soft Maple and Hay Creek Watershed. Data collected for evaluation include sediment load reduction from uplands; streambanks and gullies; and streambank (habitat) protection and COD load from barnyards. Chapter Two of this plan describes target pollutant reductions for each of the subwatersheds.

#### ***Cropland Sources***

Rusk County LCD will use the WIN HUSLE (Wisconsin Nonpoint Source) model to estimate sediment reductions due to changes in cropping practices. The LCD will use FOCS to provide data for the WIN HUSLE model on a quarterly basis, as previously described.

#### ***Streambank Sources***

LCD staff will estimate changes in streambank sediment erosion. A tally will be kept of landowners contacted, the amount of streambank sediment (in tons) being generated at the time of contact, and changes in erosion levels estimated after installing BMPs. Progress in implementation of the critical site strategy will also be discussed.

#### ***Barnyard Runoff***

County LCDs will use the BARNY model to estimate phosphorus reductions due to the installation of barnyard control practices. Progress in implementation of the critical site strategy will also be discussed.

### ***Forest Management Practices***

Progress made in increasing the use of forestry BMPs will be discussed annually. Number of forest road closures which have had stabilization practices installed and other practices installed on forest roads and skid trails such as technical and design consultations, stream crossings and critical area seedings, should be tracked.

### ***Highway and Roadway Runoff***

Progress made toward improving road construction and maintenance practices in the watershed will be discussed. The effectiveness of the training workshop will be evaluated and needs for future training will be evaluated.

### **Water Resource Evaluation Monitoring**

Limited funds and the intensive staffing needed to properly evaluate water quality changes prohibits monitoring each watershed individually. Instead, two types of evaluation monitoring are being conducted on a state-wide basis: Master Monitoring Sites and Signs of Success.

The goal of the evaluation monitoring activities is to determine the progress the Nonpoint Source Program is making towards improving the quality of Wisconsin's water resources. Evaluation monitoring activities were developed to answer the five following questions about the water resource objectives and the pollution reduction goals:

- 1) Do the levels and types of best management practices recommended in the watershed plans achieve the water resource objectives?
- 2) Do the types and levels of best management practices recommended in the watershed plans achieve the pollutant reduction goals?
- 3) Does any level of practice installation below 100 percent achieve the water resource objectives or the pollutant reduction goals?
- 4) Do we need to adjust the pollutant load reduction goals to achieve the water resource objectives?
- 5) Can we use simple environmental indicators in many of the watershed projects to provide some early evidence that the practices might achieve the water resource objectives and pollutant reduction goals?

A team of experts from state and federal agencies, and the University of Wisconsin was formed to develop and direct the evaluation monitoring activities at the Master Monitoring and Signs of Success sites.

### **Master Monitoring Sites**

Criteria were developed to select and monitor twelve streams around the state. The stream sites represent the five major types of fisheries found in agricultural and urban parts of priority watersheds, and they also represent three of the five eco-regions in the state. The five fishery types are: high gradient cold water sport, high gradient warm water sport, high gradient warm water forage, low gradient warm water forage, and low gradient cold water sport. A storm sewer outfall is also being monitored. The three eco-region types represented are the Southeastern Wisconsin till plains, the driftless area, and the North Central Hardwood Forest.

All but one of the stream sites drain a small area (about ten square miles or less). The schedule involves two years of monitoring before any best management practices are installed, five years of monitoring during the practice installation phase, 2 years of monitoring during the response period, and two years of monitoring during the post-practice installation phase, for a total of eleven years of monitoring.

State-of-the-art chemical and physical monitoring is being done at all of the stream sites. State-of-the-art biological monitoring will be done at eight of the twelve streams. Results of the monitoring will be used to determine how well the best management practices achieve the pollution reduction goals and objectives. Improving the fish community is the most important water resource objective for all the streams.

A total of about \$8,360,000 would be needed for the stream monitoring, if the work is carried out over a period of eleven years. The success of the evaluation monitoring activities depends on the installation of all of the best management practices at the Master Monitoring Sites.

### **Signs of Success**

Signs of Success (SOS) is short-term monitoring designed to provide some early evidence that better land management does make a difference. One site is being sought for each watershed project. Signs of Success will focus on one practice, such as barnyard runoff controls, manure storage, or streambank fencing, that is expected to have an early effect on the adjacent stream.

Monitoring will take place over a two-year period--the year before and the year after a practice is installed. Expected positive improvements will be on those sites where degraded habitat has occurred. Habitat sampling and photographs will be used to indicate the benefit of the practice. Limited chemical monitoring and fish sampling will be done at some sites.

The cost of the Signs of Success program is \$74,000 (1994) per year. The results of the Signs of Success monitoring will be featured in educational materials such as local newsletters and newspapers and the statewide newsletter "Fields and Streets."

SOS sites for the Soft Maple and Hay Creek watershed are still being identified and will be established shortly after the implementation stage begins.

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# APPENDIX A

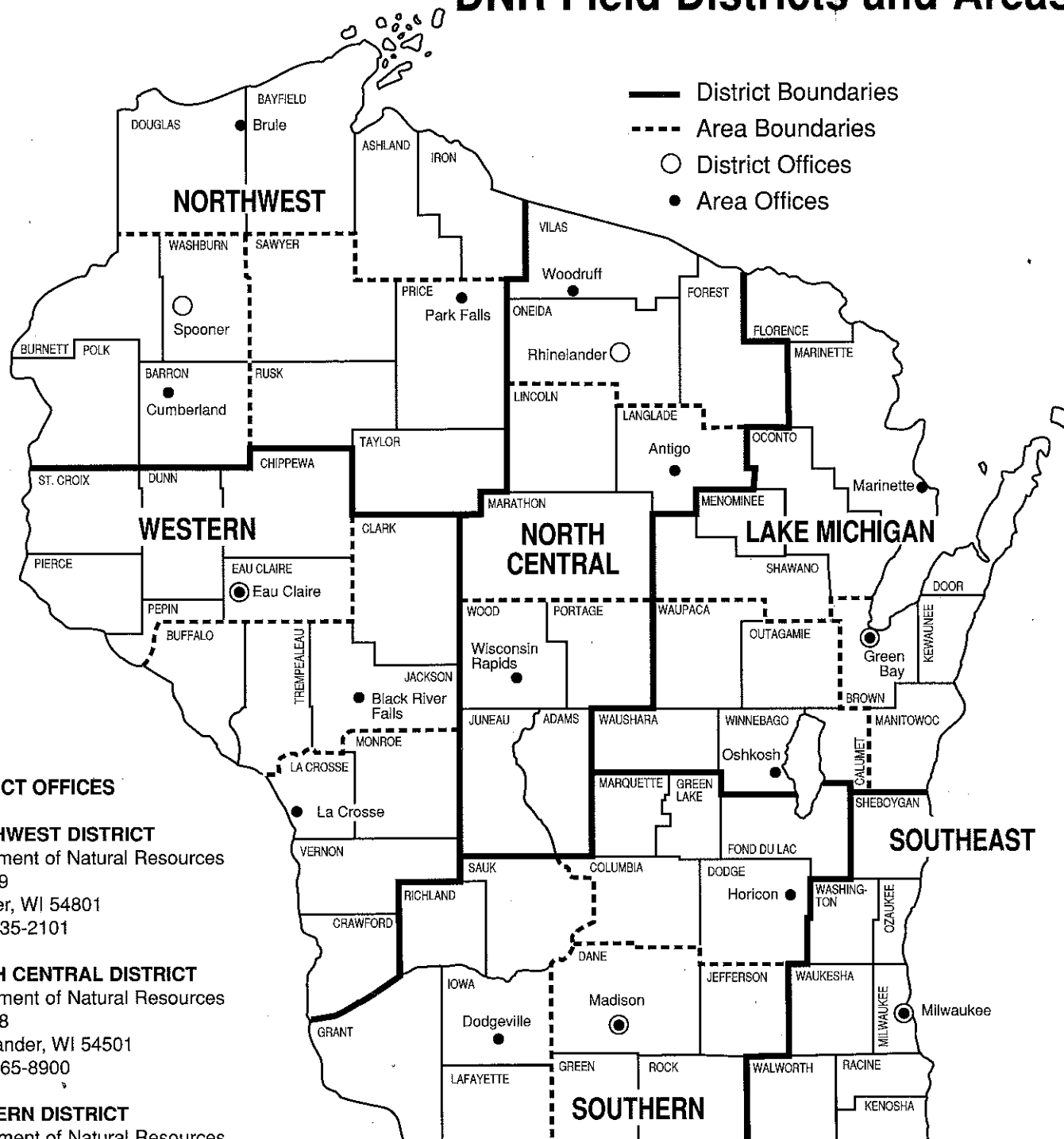
## List of Acronyms

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ACP	Agricultural Conservation Program
BARNY	Barney nutrient analysis model
BIM-GEO	DNR Bureau of Information Management-Geographical Unit
BMP	Best Management Practice
CAC	Citizen Advisory Committee
CFSA	Consolidated Farm Services Agency (United States Department of Agriculture)
COD	Chemical Oxygen Demand
CRP	Federal Cropland Reserve Program
CSA	Cost share agreement
DATCP	Wisconsin Department of Agriculture, Trade, and Consumer Protection
DILHR	Department of Industry, Labor, and Human Resources
DNR	Wisconsin Department of Natural Resources
FFA	Future Farmers of America
FOCS	Field Offices Computing System
FPP	Wisconsin Farmland Protection Program
FSA	Food Security Act
GW	Groundwater
I&E	Information and Education
LCC	Land Conservation Committee
LCD	Land Conservation Department
LWCB	Land and Water Conservation Board
NPM	Nutrient and Pest Management
NRCS	Natural Resource Conservation Service
SHS	Wisconsin State Historical Society
SIP	Stewardship Incentive Program
SOS	Signs of Success monitoring program
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UWEX	University of Wisconsin-Extension
WGNHS	Wisconsin Geological and Natural History Survey
WIN-HUSLE	Sediment transfer model based on the Universal Soil Loss Equation
WPDES	Wisconsin Pollutant Discharge Elimination System [permit system]
WUWN	Wisconsin Unique Well Number assigned to well sample sites



# DNR Field Districts and Areas



REV 3/96

## DISTRICT OFFICES

### NORTHWEST DISTRICT

Department of Natural Resources  
 Box 309  
 Spooner, WI 54801  
 (715) 635-2101

### NORTH CENTRAL DISTRICT

Department of Natural Resources  
 Box 818  
 Rhinelander, WI 54501  
 (715) 365-8900

### WESTERN DISTRICT

Department of Natural Resources  
 Box 4001  
 Eau Claire, WI 54702  
 (715) 839-3700

### LAKE MICHIGAN DISTRICT

Department of Natural Resources  
 1125 N. Military Avenue, Box 10448  
 Green Bay, WI 54307  
 (414) 492-5800

### SOUTHEAST DISTRICT

Department of Natural Resources  
 2300 N. Dr. Martin Luther King, Jr. Drive  
 Box 12436  
 Milwaukee, WI 53212  
 (414) 263-8500

### SOUTHERN DISTRICT

Department of Natural Resources  
 3911 Fish Hatchery Road  
 Fitchburg, WI 53711  
 (608) 275-3266



## Our Mission:

To protect and enhance our Natural Resources—  
our air, land and water;  
our wildlife, fish and forests.

To provide a clean environment  
and a full range of outdoor opportunities.

To insure the right of all Wisconsin citizens  
to use and enjoy these resources in  
their work and leisure.

And in cooperation with all our citizens  
to consider the future  
and those who will follow us.

