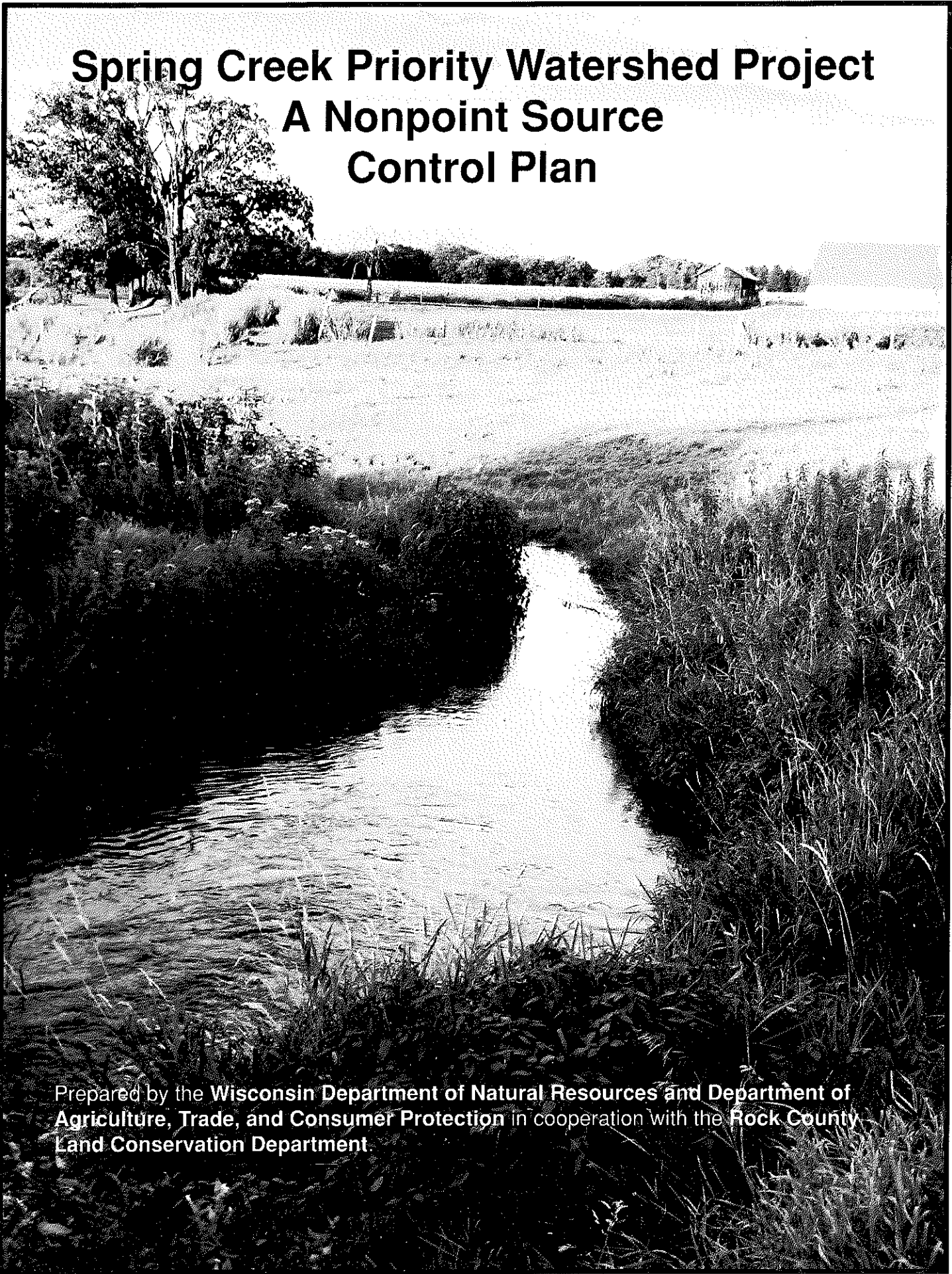


Spring Creek Priority Watershed Project

A Nonpoint Source Control Plan



Prepared by the Wisconsin Department of Natural Resources and Department of
Agriculture, Trade, and Consumer Protection in cooperation with the Rock County
Land Conservation Department

Watershed Plan Organization Information

Natural Resources Board 1994

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Nonpoint Source Control Plan for the Spring Creek Priority Watershed Project

The Wisconsin Nonpoint Source Water Pollution Abatement Program

July, 1994

This Plan Was Cooperatively Prepared By:

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

Publication WR-371-94

For copies of this document please contact:

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The Department of Natural Resources acknowledges the Environmental Protection Agency's Region V Office for their involvement in the partial funding of this activity through Section 319 of the Water Quality Act.

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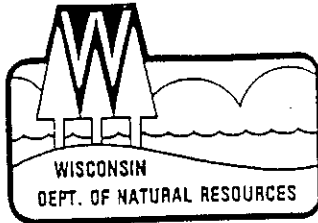
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June 16, 1993

FILE REF: 2600

Mr. Donald Upson, Chair
Rock County Board
302 East Holmes Street
Janesville, Wisconsin 53545

Dear Mr. Upson,

It is my pleasure to approve A Nonpoint Source Control Plan for the Spring Creek Priority Watershed Project. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR 120 of the Wisconsin Administrative Code. The plan has been approved by Rock County and the Wisconsin Department of Agriculture, Trade, and Consumer Protection. This letter completes the approval process set forth in Wisconsin Statutes and allows the granting of funds through the Nonpoint Source Water Pollution Abatement Program to implement the project.

I am also approving this plan as an amendment to the areawide water quality management plan for the Lower Rock River basin.

The start of this project is an exciting milestone in our cooperative effort to improve water quality throughout the Lower Rock River Basin. This plan, prepared jointly by staff from the Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection, and the Rock County Land Conservation Department, is an example of the cooperative efforts that can help improve and protect the surface and groundwater resources, and wetlands of the Spring Creek watershed. I'm confident that the cooperative spirit shown throughout the development of this plan will continue during the implementation of this project.

Sincerely,

George E. Meyer
Secretary

cc: Dave Jelinski, Department of Agriculture, Trade and Consumer Protection
Jim Huntoon, DNR Southern District Director
Craig Karr, DNR Bureau of Community Assistance



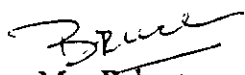
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Alan T. Tracy, Secretary

801 West Badger Road • PO Box 8911
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June 16, 1993

Mr. Bruce Baker, Director
Bureau of Water Resources Management
Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707

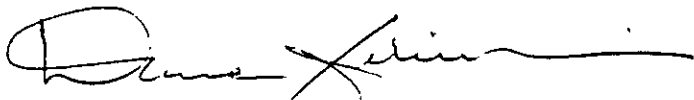

Dear Mr. Baker:

The Department of Agriculture, Trade and Consumer Protection has reviewed and hereby approves the "Nonpoint Source Control Plan For The Spring Creek Priority Watershed Project".

We look forward to assisting DNR and the Rock County Land Conservation Committee in implementing the project.

Please contact Sue Porter (273-6205) if we can be of any further assistance in moving the project to implementation.

Sincerely,



Dave Jelinski, Director
Land and Water Resources Bureau
AGRICULTURAL RESOURCE MANAGEMENT DIVISION
(608) 273-6411

cc: Becky Wallace
Louie Bobolz, Rock County Land Conservation Dept.

RESOLUTION**ROCK COUNTY BOARD OF SUPERVISORS**LAND CONSERVATION COMMITTEE
INITIATED BYLAND CONSERVATION COMMITTEE
SUBMITTED BYLOUIS BOBOLZ
DRAFTED BYMAY 28, 1993
DATE DRAFTED**TITLE**APPROVAL OF SPRING CREEK WATERSHED PLAN

1 WHEREAS, THE Wisconsin Department of Natural Resources has designated the
2 Spring Creek Watershed as a priority watershed through the State Nonpoint
3 Program; and,

4 WHEREAS, this designation will protect and enhance the water quality of
5 Spring Creek through voluntary participation in the project; and,

6 WHEREAS, Water Quality Best Management Practices can be implemented and cost-
7 shared with funds available through a Nonpoint Source Agreement between the
8 County and the Department of Natural Resources; and,

9 WHEREAS, landowners in the Spring Creek Watershed area expressed their interest
10 in participating in the project and acceptance of the plan at a Public Hearing
11 on May 26, 1993.

12 NOW, THEREFORE, BE IT RESOLVED, by the Rock County Board of Supervisors at its
13 regular June 10, 1993, meeting, that the priority watershed designation and the
14 Spring Creek Watershed Plan be approved; and,

15 BE IT FURTHER RESOLVED, that the Rock County Land Conservation Committee be
16 authorized to enter into agreements with the Department of Natural Resources
17 and watershed cooperators to carry out the goals of the plan.

Respectfully submitted,

LAND CONSERVATION COMMITTEE

Richard Towns
Richard Towns, Chairman

Ilan B. Hartung
Ilan B. Hartung

William A. Agnew
William A. Agnew, Vice Chair

Vincent Oestreich
Vincent Oestreich

Floyd Niedfeldt
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Donald E. Upson
Donald E. Upson

Durlin L. Harnack
Durlin L. Harnack

Fred Zilke
Fred Zilke

LEGAL NOTE:

This action is authorized pursuant to
sec. 93.07 Wls. Stats.

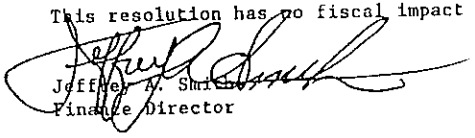
Thomas A. Schroeder
Thomas A. Schroeder
Corporation Counsel

93-6A-030

APPROVAL OF SPRING CREEK WATERSHED PLAN
Page 2

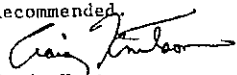
FISCAL NOTE:

This resolution has no fiscal impact in and by itself.


Jeffrey A. Smith
Finance Director

ADMINISTRATIVE NOTE:

Recommended.


Craig Knutson
County Administrator

ROCK COUNTY, WISCONSIN



KAY S. O'CONNELL
COUNTY CLERK

Maureen K. Johnson
Deputy Clerk

Office of County Clerk
51 South Main Street
Janesville, WI 53545
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STATE OF WISCONSIN)

) SS

COUNTY OF ROCK)

This is to certify that this resolution is a true and correct copy of the original as passed by the Rock County Board of Supervisors at a meeting of said Board held in the Court House at Janesville, Wisconsin, Thursday,
June 10, 19 93.

Given under my hand and Official Seal of the County of Rock, State of Wisconsin, this 10th day of June, 19 93.

Kay S. O'Connell

Kay S. O'Connell
Rock County Clerk

(SEAL)

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CHAPTER ONE

Introduction, Purpose and Legal Status

Wisconsin Nonpoint Source Water Pollution Abatement Program

The Wisconsin State Legislature created the Wisconsin Nonpoint Source Water Pollution Abatement Program (NPS) in 1978. The goal of the NPS Program is to improve and protect the water quality of streams, lakes, wetlands, and groundwater by reducing pollutants from rural nonpoint sources. The six-square-mile Spring Creek Watershed, located in Rock County, was designated a "priority watershed" in 1991. The primary objective of this project is to reduce nonpoint source pollution loads to Spring Creek to enhance and protect the water quality of Spring Creek.

Nonpoint sources of pollution include eroding agricultural lands, streambanks, field application of manure, fertilizers and pesticides and runoff from livestock wastes and gullies. Pollutants from nonpoint sources are carried to the surface water or groundwater through the action of rainfall runoff, snowmelt, and infiltration.

The following is an overview of the NPS Program:

- The DNR and DATCP administer the program which focuses on critical hydrologic units called priority watersheds. The program is implemented through priority watershed projects for which a plan is prepared.
- Local units of government implement the watershed project. Water quality improvement is achieved through voluntary implementation of nonpoint source controls (best management practices or BMPs) and adoption of ordinances. Landowners, land renters, counties, cities, villages, towns, metropolitan sewage districts, 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.
- Informational and educational activities are employed to encourage participation.
- The DNR and DATCP review the progress of the counties and other implementing units of government, and provide assistance throughout the eight-

year project. The DNR monitors improvements in water quality resulting from control of nonpoint sources of pollution in the watershed.

Priority Watershed Project Planning and Implementation Phases

Planning Phase

The planning phase of the project began in 1991 and included the following information-gathering and evaluation steps:

1. Determine the conditions and uses of groundwater, and Spring Creek.
2. Inventory types of land uses and severity of nonpoint sources impacting streams, lakes and groundwater.
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 will be accomplished through the ongoing integrated resource management planning efforts in the Rock River Basin.
4. Determine levels of nonpoint source pollution control and measures necessary to improve and/or protect water quality.
5. Prepare and gain approval for a priority watershed plan documenting the above evaluations, implementation procedures and costs.

Implementation Phase

The implementation phase begins following review of the priority watershed plan by the Citizens Advisory Committee, the project team, a public hearing and approval by the DNR, the DATCP, and the Board of Supervisors for Rock County. This phase is characterized below:

- The DNR enters into local assistance agreements with local units of government with implementation responsibilities identified in the plan. These agreements provide funds necessary to maintain the resources and staff required for plan implementation.

- In the rural portions of the watershed, the Rock County LCD contact eligible landowners to determine their interest in voluntarily installing BMPs identified in the plan.
- For rural practices, the landowner and the county sign cost-share agreements outlining the practices, costs, cost-share amounts and a schedule for installation of BMPs. All practices are scheduled for installation up to five years from the date the agreement is signed. The DNR and local units of government sign similar agreements for urban practices.

Legal Status of the Nonpoint Source Control Plan

The Spring 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 under the cooperative efforts of the DNR, DATCP, the Rock County LCD, and the Spring Creek Citizens Advisory Committee.

This plan is the basis for the DNR to enter into cost-share and local assistance grants and is used as a guide to implement measures to achieve desired water quality conditions. In the event that a discrepancy occurs between this plan and the statutes or the administrative rules, or if the statutes or rules change during implementation, the statutes and rules will supersede the plan.

Plan Organization

The remainder of this plan is divided into nine chapters:

The contents of each chapter are described below:

Chapter Two. "Watershed Characteristics" is an overview of the cultural and natural resource features pertinent to planning and implementation efforts for the priority watershed project.

Chapter Three. "Water Resource Conditions, Nonpoint Sources and Water Resource Objectives" characterizes the existing and potential biological and recreational uses of surface waters. The results of the nonpoint source inventories and evaluations and water resource objectives are discussed.

Chapter Four. "Nonpoint Source Pollution Control Strategy" identifies the level of rural nonpoint source control needed to meet the water resource objectives and identifies the decision criteria and the nonpoint sources eligible for funding under the priority watershed project.

Chapter Five. "Detailed Program for Implementation" describes the means in which the local units of government administer the project, and estimates a local assistance and management practice cost-share budget.

Chapter Six. "Information and Education Program" describes techniques and activities for increasing awareness and understanding of water resources in the watershed, principles of nonpoint source pollution, best management practices, and the priority watershed project in general.

Chapter Seven. "Integrated Resource Management Program" presents the strategy for involving DNR resource management programs (fisheries management, wildlife, etc.) in the nonpoint source pollution abatement efforts in the Spring Creek Watershed.

Chapter Eight. "Project Tracking" discusses the means for assessing the amount of nonpoint source control gained through installation of best management practices.

Chapter Nine. "Water Quality Monitoring and Evaluation" presents strategy and a schedule for monitoring streams and lakes to determine the water quality impacts of implementing nonpoint source controls.

CHAPTER TWO

General Watershed Characteristics

Location

The Spring Creek Watershed is a six-square-mile drainage basin located approximately 25 miles south of Madison in southern Wisconsin (map 2-1).

Spring Creek drains to Badfish Creek which in turn drains to the Yahara River. Spring Creek is part of the Rock River Basin. (map 2-2).

The following is a brief overview of the watershed's cultural and natural resource features.

Cultural Features

Civil Divisions

The Spring Creek Watershed lies entirely within Rock County. There are no incorporated areas in the watershed. The only public land within the watershed is a 200 acre farm owned by Farmers Home Administration.

Population Size and Distribution

The Spring Creek Watershed population is estimated to be about 200 persons. All of the watershed population lives in rural unincorporated areas. Population growth rates in the watershed are stable. Regional trends suggest that the watershed's population will continue to stabilize.

Land Uses

Rural land uses predominate in the watershed. Agriculture is the most important land use, comprising 86 percent. Row crop farming is the primary enterprise, with the average farm size being 220 acres. Rock County ranks first statewide in soybean production. Woodlands cover 3 percent of the land area. Developed land uses occupy less than 3 percent of the watershed (table 2-1).

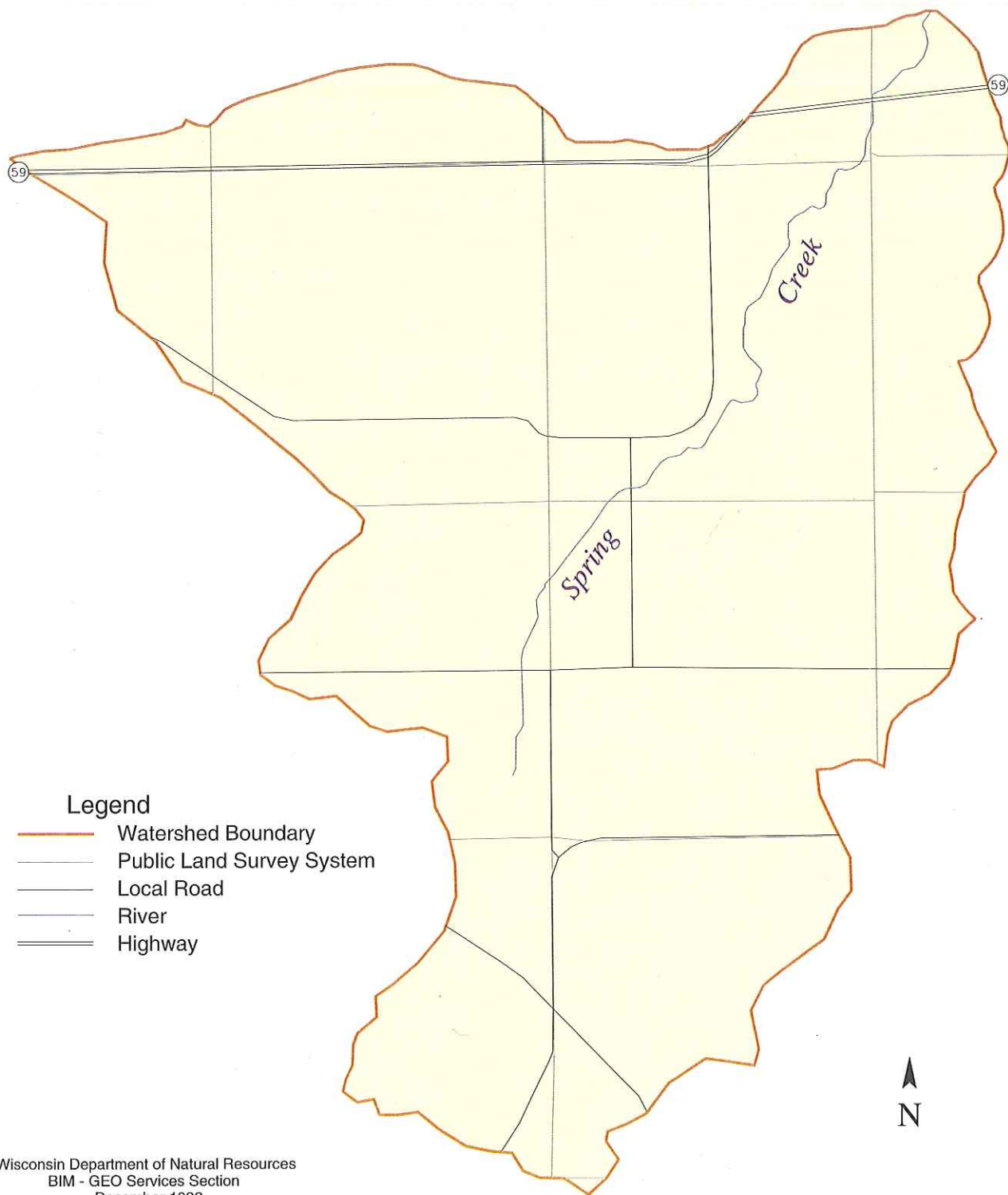
Table 2-1. Summary of Land Uses: Spring Creek Watershed

Land Uses	Acres	Percent
Agricultural	3,139	86
pasture	80	3
cropland	3,059	83
Grassland	120	3
Woodland	130	3
Developed	110	3
Wetland*	188	5

* These are estimates of wetland acres based on WIN HUSLE inventory data. The estimates are of actual wetland acres, not cropped wet fields. See wetland section in this chapter for a more comprehensive estimate of wetland acreages.

Source: Rock County LCD

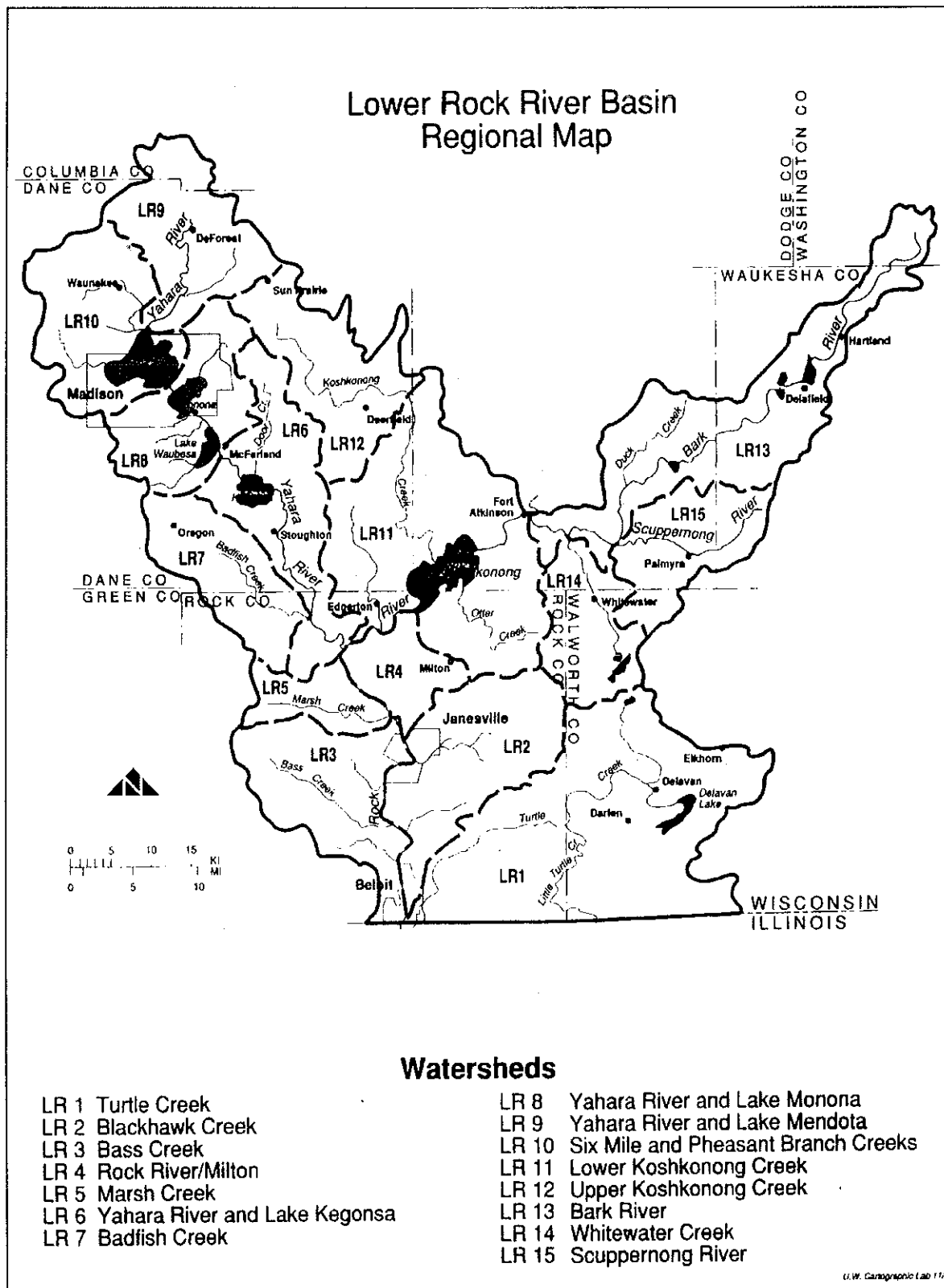
Map 2 - 1. Spring Creek Watershed



0 0.25 0.5 0.75 1 Miles
0 0.25 0.5 0.75 1 1.25 1.5 Kilometers
Scale 1:29,000



Map 2-2. Lower Rock River Basin Regional Map



Natural Resource Features

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 Spring Creek Watershed lies in the continental zone which is characterized by winters which are long and relatively cold and snowy and summers which are mostly warm with periods of hot humid conditions. Mean annual precipitation for the region is about 33 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 and soil moisture is highest.

Topography

The Spring Creek Watershed is typical of the northern part of Rock County where hills and kettles predominate. Land forms are almost entirely formed by glacial deposition. The Johnstown moraine forms the southern boundary of this area.

Geology and Soils

Soils of the Spring Creek Priority Watershed are of the Kidder - St. Charles association which occurs on gently rolling till plains. These soils are deep and consist of well drained silt loams overlying sandy clay loam to silty clay loam subsoils. They are formed on till plains defined as unsorted sand and gravel deposited by glacial ice. Soils in this association are nearly level to steep. More than half of the land area in the Spring Creek Watershed is highly erodible land.

The geology of watershed consists of Precambrian age (4.5 billion to 600 million years ago) crystalline bedrock overlain by Cambrian age sandstone (600 to 500 million years ago). Overlying the sandstone is Ordovician age dolomite and sandstone (500 to 400 million years ago). After deposition of the sandstone and dolomite layers, a long period of erosion carved out deep valleys and left an irregular surface in Rock County. One of these deep bedrock valleys cuts through the city of Janesville. Over time these valleys have become filled with sand and gravel from river and glacial deposition.

Beginning approximately 30,000 years ago (Pleistocene age), glaciers advanced and retreated across Rock County depositing sand and gravel as unsorted till and sorted outwash. The Johnstown end moraine, a topographic high which marks the southern boundary of the Spring Creek watershed, is the furthest extent of the glacier.

Surface Water Resources

Land drainage patterns in the Spring Creek Watershed are delineated as a single subwatershed shown in map 2-1. See table 2-2 for the general conditions of major water resources in the Spring Creek Watershed.

Streams

Spring Creek (three miles) is the only perennial stream in the watershed.

While Spring Creek supports a cold water class III trout fishery, it is not reaching its highest potential use due to pollution from nonpoint sources. Eroding croplands and streambanks and improperly managed livestock operations are the major sources of nonpoint pollution in the watershed.

Table 2-2. General Condition of Major Water Resources: Spring Creek Watershed

Water Body	Biological Use		Problems Related to Nonpoint Source Pollution
	Current	Potential	
RIVERS AND STREAMS			
Spring Creek	Class III trout stream	Class II Trout Stream	sediment, nitrate

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 sportfish.

A wetland inventory was done to identify existing and modified or converted wetlands for the purpose of protection from degradation or potential restoration. The focus of the inventory was on wetlands that are presently in, or have been in the past, degraded through drainage, grazing, cropping, or other activities causing water storage loss, build up of sediments, and drainage to vegetation. Appendix A describes methods used in the inventory. Data were collected on 47 wetland sites (488 acres). Data were gathered from Soil Conservation Service maps, air photos, and the DNR wetland inventory maps; as a result this is a more

comprehensive estimate than indicated in table 2-3: Summary of Land Uses. Guidelines for wetland restoration, which will be a component of this project, are outlined in Chapter Four. See table 2-3 for Wetland Inventory Summary.

Groundwater Resources

Groundwater is the sole source of drinking water within the Spring Creek Priority Watershed. Groundwater is stored and moves 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 of the pore spaces and cracks are filled or saturated with groundwater. A municipal or private well is simply a pipe through which groundwater is pumped from an aquifer to the land surface.

Since 1936, the State of Wisconsin has required well drillers to document well construction and rock and soil layers encountered during well installation. Driller construction reports for wells located in the Spring Creek watershed indicate that private wells draw groundwater from three aquifers: 1) the Pleistocene sand and gravel aquifer; 2) the Ordovician age sandstone and dolomite aquifer; and 3) the Cambrian sandstone aquifer.

Wells drawing water from the Pleistocene sand and gravel aquifer range from 55 to 168 feet deep. Depth to groundwater ranges from 23 to 88 feet from the land surface. Wells completed in the Ordovician aquifer range from 107 to 174 feet deep. Depth to groundwater in these wells ranges from 16 to 70 feet from the land surface. Wells completed in the Cambrian sandstone aquifer range from 52 to 197 feet deep with depth to groundwater ranging from 20 to 75 feet below the ground surface.

Table 2-3. Wetland Inventory Summary: Spring Creek Watershed

	Prior Converted		Grazed Wetland		Excavated Wetland		Farmed in Dry Years		Converted Wetland		Vegetation Recently Removed		Abandoned Farmland Wetland			
Subwatershed	number of		number of		number of		number of		number of		number of		number of		Total Sites	Total Acres
	sites	acres	sites	acres	sites	acres	sites	acres	sites	acres	sites	acres	sites	acres		
Spring Creek	28	300	4	88	2	2	4	13	1	28	1	2.5	7	80	47	488

Groundwater Quality

As part of the Water Quality Appraisal Report (Marshall, 1993), private well samples were collected and analyzed for nitrate + nitrite. Sample analytical results are summarized in table 2-4. Samples analyzed for nitrate + nitrite showed concentrations ranging from not

detected to 16 milligrams per liter (mg/L). The groundwater enforcement standard (ES) for nitrate is 10 mg/l. Nitrate + nitrite concentrations above 2 mg/L exceed the states preventive action limit (PAL).

Enforcement Standard (ES) Health Advisory Level: The concentration of a contaminant at which the enforcing agency, either the Department of Industry, Labor & Human Relations, the DATCP, or DNR, must take action.

Preventative Action Limit (PAL): A lower concentration of a contaminant than the Enforcement Standard, the PAL is a warning that human activities are affecting groundwater quality.

Eight samples (33 percent) exceeded 10 mg/L and ten (42 percent) of the samples exceeded 2 mg/L. Results so far do not indicate a pattern of groundwater contamination that can be linked to specific sources of nitrate.

Table 2-4. Well Sampling Results: Spring Creek Watershed

NITRATE						
Subwatershed	Number of Nitrate Samples		Number of Nitrate Samples		Number of Nitrate Samples	
	less than 2.0 mg/l	%	between 2.0 and 10.0 mg/l	%	greater than 10.0 mg/l	%
Spring Creek	6	25	10	33	8	42
TRIAZINE						
Subwatershed	Number of Triazine Samples		Number of Triazine Samples		Number of Triazine Samples	
	less than 0.3 µg/l	%	between 0.3 and 3.0 µg/l	%	greater than 3.0 µg/l	%
Spring Creek	21	92	2	8%	0	0

Concentration's of triazine in the Spring Creek Watershed ranged from not detected to 0.4 micrograms per liter (µg/L). One microgram per liter is comparable to one drop in 10,000 gallons (a small swimming pool). No samples exceeded the ES (health advisory

level) while two samples (8 percent) had detects of triazine. [As with nitrate + nitrite analytical results, no specific source of contamination is indicated by the results.]

See figure 2-1, Groundwater Schematic.

Archaeological Sites: Coordination with State and Federal Historic Preservation Laws

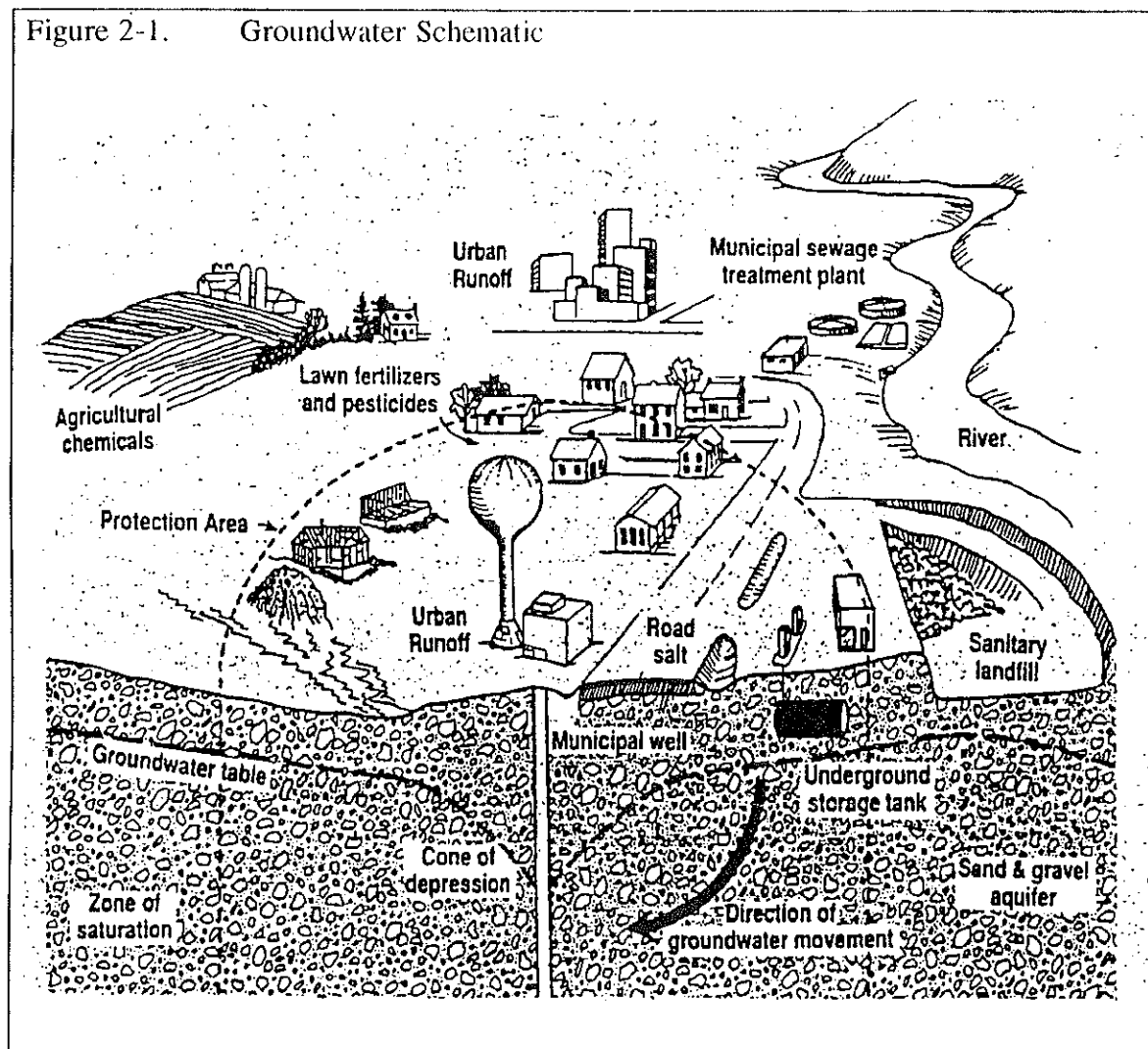
Projects using state and federal funding, assistance, licenses and permits are required by law to consider the effects of their actions on archaeological and historical sites, and historical structures. The watershed project is a joint cooperative effort between federal, state, and county agencies as 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 which is both compatible to preserving cultural sites and implementing the watershed project.

Any existing archaeological sites within the Spring Creek Watershed will need special consideration when structural best management practices are being considered. Settling basins, manure storage structures, and streambank or shoreline shaping and riprapping are likely practices that may impact archaeological sites. As discussed above, state and federal laws require preservation of archaeological resources within the framework of the NPS Program.

The Spring Creek Priority Watershed Project will address these concerns with the following procedures:

1. Rock County will obtain inventory maps from the regional Wisconsin State Historical Society office, and will plot sites on topographic maps. Counties will also obtain a supply of landowner questionnaires from the historical society which will be used to identify additional non-inventoried sites.
2. Landowners' questionnaires will then be sent to the State Historical Society for determination of archaeological significance. In addition, landowners will have their lands evaluated by county staff for the need to conduct an archaeological survey (essentially compare property with known archaeological site locations). The historical society will determine the need for additional, extensive surveys. The counties and the DNR District NPS Program coordinator will also be involved in this determination.

Figure 2-1. Groundwater Schematic



3. If the inventory or questionnaire does reveal an archaeological site and the proposed best management practice may impact the site, an archaeological survey conducted by a qualified archaeologist will need to be completed. The survey will assess the potential of the practice to significantly impact the site. Alternative BMPs may need to be considered both before and after the results of the survey.
4. 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 specific site. Cost-share agreements will contain language which nullifies or partially nullifies the cost-share agreement based on the final results of the archaeological survey.

Endangered and Threatened Resources

Information on threatened and endangered resources was obtained from the Bureau of Endangered Resources of the Department of Natural 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 Spring 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 which are in the process of being added to the database and so are not in the lists below.

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

Any species whose continued existence as a viable component of this state's wild animals or wild plants is determined by the Department of Natural Resources to be in jeopardy on the basis of scientific evidence. (Our files do not contain records of any Wisconsin Endangered species in this watershed).

Wisconsin Threatened Species

Any species which appears likely, within the foreseeable future, on the basis of scientific evidence, to become endangered. (Our files do not contain records of any Wisconsin Endangered species in this watershed).

Emydoidea blandingii, Blandings Turtle

The Blandings turtle is presently under review by the US Fish and Wildlife Service for federal listing and threatened in Wisconsin. This species is found in sedge meadows, southern wet and southern wet-mesic forest, wetland wet-mesic prairie, prairie potholes, and large ponds, slow-moving rivers and shallow lakes. The breeding season occurs from April through September.

Wisconsin Special Concern Species

Any species about 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. (Our files do not contain records of any Wisconsin Endangered species in this watershed).

Natural Areas

Natural areas are sites that contain high quality examples of natural communities. No natural areas have been identified in the Spring Creek Priority Watershed.

If specific locational or other information is needed about these species or natural communities, contact the Bureau of Endangered Resources, Department of Natural 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.

CHAPTER THREE

Water Quality Conditions, Water Quality Objectives and Nonpoint Sources

Introduction

Topics covered in this chapter include:

- ★ major nonpoint source pollutants
- ★ establishment of water quality objectives
- ★ results of nonpoint source inventories
- ★ individual subwatershed's general characteristics
- ★ amount of pollutant control necessary to achieve desired water resource conditions
- ★ other potential pollutant sources

Major Nonpoint Source Pollutants

Nonpoint sources are responsible for the degraded conditions of the streams in this watershed. Excessive amounts of sediment, nutrients, and bacteria degrade the water quality causing unbalanced fish communities with depressed populations and limited diversity. In this watershed the two most serious pollutants are manure and sediment. These are discussed below.

Manure

Manure contains several components that adversely affect water quality and aquatic life. Manure entering a stream breaks down, resulting in depletion of the oxygen in the water which fish and other aquatic life require to survive. Also, manure contains nitrogen which can form ammonia in the streams and lakes. In high concentrations the ammonia is toxic to fish and other aquatic life. Ammonia toxicity is temperature and pH dependent. The nutrients in manure (including nitrogen and phosphorus) also promote nuisance algae and weed growth in the streams and lakes. Finally, the bacteria found in livestock manure is

harmful to livestock drinking the water, and to humans using the water for recreation. The major sources of manure in this watershed are runoff from barnyards and runoff from improperly field-spread manure.

Slopes and narrow valleys present special manure management problems. Many barnyards and manure-spreading sites are located in close proximity to streams or on slopes. In either case, organic loading to streams is often significant.

Sediment

Sediment adversely impacts the water resources in many ways. It degrades habitat for fish and aquatic insects which support fish and other forms of aquatic life. High sediment concentrations abrade fish gills making the fish more susceptible to disease, fills in pools and degrades fish spawning habitat. Suspended sediment also causes the water to be warmer in the summer, and warm water cannot hold as much oxygen as cold water. The sources of sediment in this watershed are upland erosion from croplands, streambank erosion, and shoreline erosion. Heavy or long term sediment deposits are less problematic in upland streams of the watershed. This is due to the fact that the gradients and higher velocities tend to scour streams of sediment and therefore do not result in long-term habitat destruction caused by channelization or heavy sediment deposits. Instead, streambank erosion is the most common form of habitat destruction.

Nitrates

Groundwater with nitrate levels greater than 10 milligrams per liter (mg/l) exceed state groundwater standards. At this level it is recommended that infants and women of child-bearing age not consume the water because the nitrate interferes with the ability of the blood to carry oxygen. High levels of nitrates may also indicate other contaminants in the drinking water. High nitrate concentrations in the drinking water are also linked to spontaneous abortions in livestock. The most likely sources of nitrates in the groundwater in this watershed are nitrogen fertilizers and manure applied to croplands. See groundwater discussion in Chapter Two.

Water Quality Conditions and Recreational Uses

Streams

Spring Creek is the only named stream in the watershed. The creek is approximately 3 miles long and supports a Coldwater Class III trout fishery.

Water Quality Objectives

The DNR staff with assistance from the Rock County staff and the DATCP developed water quality objectives. Objectives were identified for each subwatershed and are listed in the following subwatershed descriptions. Details of objective development can be found in the Spring Creek Priority Watershed Water Resources (Marshall, 1993).

Following are the general objectives for streams and the reservoir:

1. **Protection:** Protection refers to maintaining the present biological and recreational uses supported by a stream or the reservoir. For example, if a stream supports a healthy coldwater fishery and is used for full-body contact recreational activities, the objective seeks to maintain those uses.
2. **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, if a stream supports a warmwater fishery whose diversity could be enhanced, the objective focuses on changing those water quality conditions which keep it from achieving its full biological potential.
3. **Restoration:** Restoration refers to upgrading the existing capability of the resource to support a higher category of biological use. An example would be a stream which historically supported healthy populations of warmwater game fish, but no longer does. This objective seeks to improve conditions allowing viable populations of forage and warmwater game fish species to become reestablished.

The water quality conditions needed to support the objectives 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.

Following are abbreviations for designated biological uses in the subwatershed discussions.

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

Discussions also include the "class" of trout streams based on the publication "Wisconsin Trout Streams" [DNR Publ. 6-3600(80)] and Outstanding/Exceptional Resource Waters, Wisconsin Administrative Code NR 102.20 and NR 102.11.

Class I trout streams are high quality, and populations are sustained by natural reproduction.
Class II trout streams have some natural reproduction but may need stocking to maintain a desirable fishery.
Class III trout streams have no natural reproduction and require annual stocking of legal-size fish to provide sport fishing.

See table 3-1 for a summary of the water resource conditions and objectives for the Spring Creek Watershed.

Watershed Discussion

Spring Creek (SC)

Watershed Description

Spring Creek is a medium gradient (16 feet/mile) trout stream and one of only three managed cold water fisheries in Rock County. The stream drains approximately six square miles of farmland in Union and Porter townships and lies within the Southeastern Wisconsin Till Plains Eco-region.

Water Quality Conditions

Spring Creek supports a COLD water Class III trout fishery. Spring Creek has been degraded from stream channelization, streambank erosion, and upland erosion. Manure runoff from animal lots and heavily pastured areas contribute organic loadings and high bacteria levels to the stream.

For purposes of describing direct land use impacts and stream conditions, Spring Creek can be divided into two segments, south of East Union Road (Segment 1) and east of East Union Road (Segment 2). See map 3-1.

Segment 1 Most of Segment 1 suffers habitat loss as a result of channel straightening. Stream channelization is the primary reason efforts to manage the stream as a trout fishery were abandoned in the 1950's. More recently, intensive pasturing in Segment 1 was abandoned and most of the reach is now well buffered with riparian vegetation. Over-hanging vegetation provides habitat though most of the segment lacks meanders, pools

Table 3-1. Water Resource Conditions and Objectives: Spring Creek Watershed

	Stream Name	Length (Miles)	Biological Use Current Use/Miles	Potential Use/Miles	Limiting Factors**	Observed or Potential Sources***	Water Resource Goals
Spring Creek	Spring Creek Segment 1)	1.1	Cold/Class III	Cold/Class II	SED, HM	CL, BY	Improve to Class II fishery. Reduce sedimentation from intermittent tributaries. Maintain buffer zone.
Spring Creek	Spring Creek (Segment 2)	1.6	Cold/Class III	Cold/Class II	SED, HAB	CG, SE, CL, BY	Improve to Class II fishery. Improve arthropod community balance. Improve habitat. Stabilize stream banks. Reduce sedimentation and organic loading.

LEGEND:

* **Biological Use, Existing** - this column indicates the existing biological use supported by the stream as defined in NR 102 (04)(3) under fish and aquatic life uses.

COLD - coldwater communities

Biological Use, Potential: This column indicates the biological use a stream or stream segment could meet if it was well managed and pollution sources controlled. In many cases the potential use is the same as the existing use. In other streams potential use may be higher than the existing use. Abbreviations are the same as those used in the existing use columns. The sources of information are indicated by footnotes on each table. The classifications for trout streams came from "Wisconsin Trout Streams" (DNR Publ. 6-3600[80]).

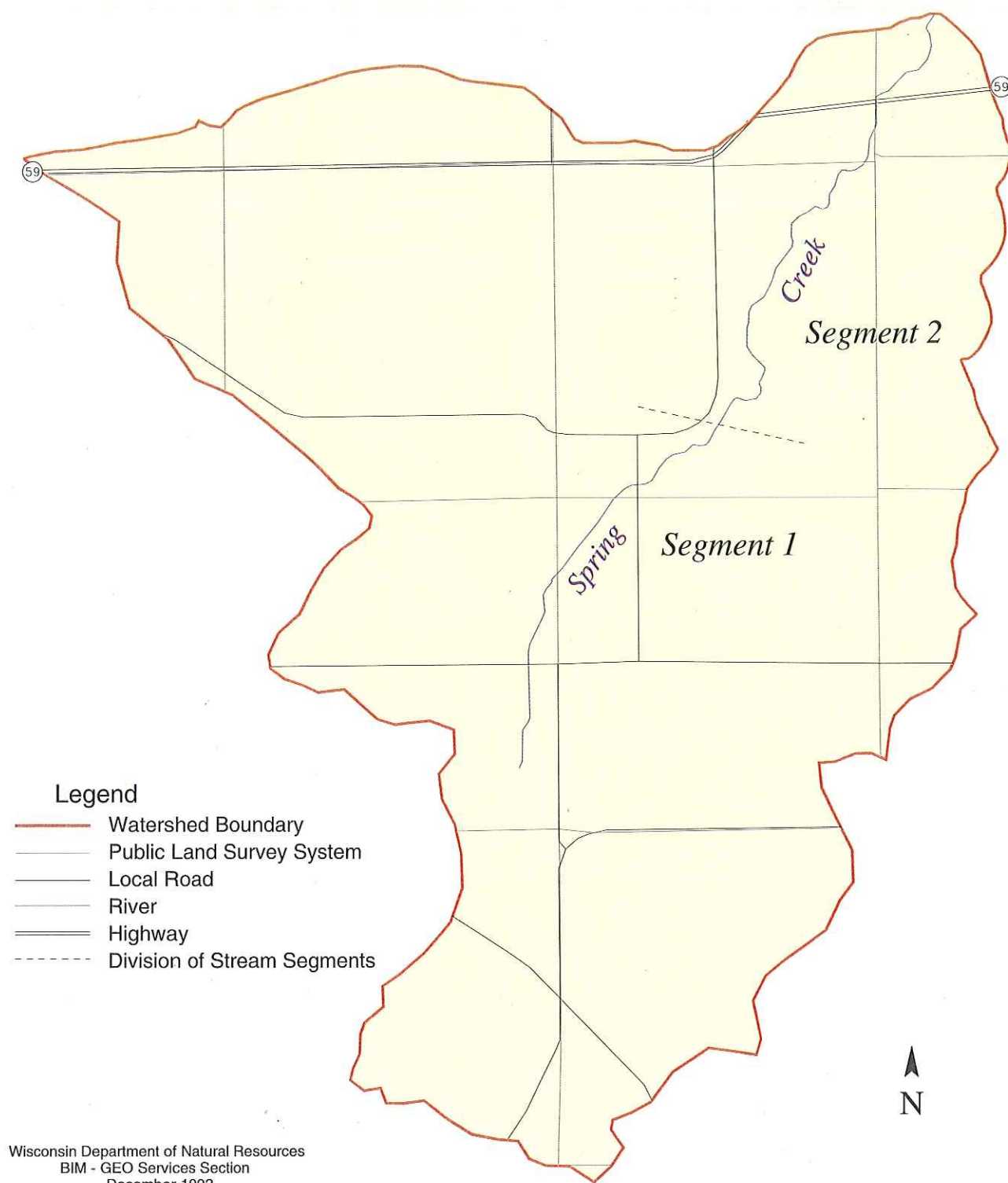
** **Limiting Factors**

HAB - Habitat (lack of cover, sedimentation scouring etc.)
SED - Sedimentation (filling in of pools)
HM - Hydrologic modification

*****Observed or Potential Sources**

CL - Cropland erosion
SB - Streambank erosion
PSB - Streambank pasturing
BY - Barnyard or exercise lot runoff
CG - Cattle Grazing

Map 3 - 1. Spring Creek Steam Segment Delineations



0 0.25 0.5 0.75 1 Miles
0 0.25 0.5 0.75 1 1.25 1.5 Kilometers
Scale 1:29,000



and riffles characteristic of natural streams. Considerable sediment has accumulated in Segment 1 even though runoff from riparian land is unlikely. Heavy sediment persists due to the sluggish nature of the channelized segment and three intermittent tributaries which transport soil from remote areas. Low flow in the upper half of Segment 1 limit potential for trout production.

Segment 2 Segment 2 displays natural stream hydrology with frequent pools, riffles and meanders. In spite of good pool/riffle frequency, habitat is marginal in Segment 2 due to heavy pasturing and stream bank erosion. Eroded stream banks are a source of sediment to the stream and adequate cover is scarce. The level of embeddedness or sediment depth is less severe in Segment 2 because of scouring and resuspension. However, the amount of embeddedness is enough to reduce suitable habitat for most macroinvertebrates or spawning fish.

Feedlots and manure management practices in key watershed locations are sources of organic enrichment and high bacteria levels in the stream. The combination of factors including sedimentation, organic loading and loss of cover have contributed to low recruitment and survival of brown trout. Currently, the stream is not meeting criteria for a Class II trout fishery and displays marginal characteristics of a Class III stream. [Excerpted from Spring Creek Water Resources Appraisal Report, Marshall, 1993]

Nonpoint Source Pollutants

- ★ The Spring Creek Watershed contains 5 animal lots which contribute 500 pounds of phosphorus, annually. This represents 3 percent of the phosphorus for the entire watershed.
- ★ The upland sediment delivery in the Spring Creek Watershed is 3,241 tons, annually, or 92 percent of the entire watershed load. Cropland is the major source in this subwatershed.
- ★ Streambanks deliver 5 percent (173 tons) of the sediment delivered to the Spring Creek Watershed.

Water Resource Objectives

Segment 1

1. Improve to Class II fishery.
2. Reduce sedimentation from intermittent tributaries.
3. Maintain buffer zone.

Segment 2

1. Improve to Class II fishery.
2. Improve anthropod community balance.
3. Improve habitat, stabilize streambanks.
4. Reduce sedimentation and organic loading.

Results of Nonpoint Source Inventories

Barnyard Runoff

Runoff carrying a variety of pollutants from barnyards and other livestock feeding, loafing, and pasturing areas is a significant source of pollutants in the streams of the Spring Creek Watershed. Livestock operations comprised of 5 animal lots are a source of 500 pounds of phosphorus, per year (table 3-2). Most of the oxygen-demanding pollutants and nutrients associated with these operations drain via concentrated flow to creeks and wetlands.

Table 3-2. Barnyard Inventory Results: Spring Creek Watershed

Subwatershed	Number of Barnyards	Total Phosphorous* (lbs)	Percent Watershed P Load
Spring Creek	5	500	3%

* Based on Annual Phosphorus Loads

Sources: Rock County LCD, DNR and DATCP

Upland Sediment

Intensive agricultural practices have caused considerable amounts of eroded soil to reach Spring Creek wetlands in the Spring Creek Watershed.

Upland sediment sources were evaluated through subarea sampling and extrapolation for the entire watershed (6 square miles). The results of this inventory are summarized in table 3-3. An estimated 3,241 tons of soil per year are delivered to wetlands or streams in the watershed from croplands. An additional 88 tons/year are delivered from grassland, pastures, and woodlots. Croplands are the source of 92 percent of the sediment delivered to surface waters. Table 3-3 summarizes upland sediment loading by land use for all subwatersheds.

Table 3-3. Summary of Upland Sediment Loading By Land Use: Spring Creek Watershed

Subwatershed		Cropland	Developed	Grassland	Pasture	Woodlot	Wetland (%)	Totals
Spring Creek	Acres	3,059	110	120	80	130	188	3,687
	Sediment	3,241	7	7	74	7	11	3,347

* Sediment is reported in tons/year.

** Data was extrapolated from subarea sampling.

Streambank Erosion

Streambank erosion contributes 5 percent of the total sediment to surface waters in the Spring Creek Watershed. Approximately 3 miles of streams were evaluated. Significant erosion has occurred and/or aquatic habitat and water quality were degraded along approximately 1.6 miles of streambank. An estimated 173 tons of sediment are eroding from streambanks into streams annually. See table 3-4 for streambank inventory results.

Table 3-4. Streambank Inventory Results: Spring Creek Watershed Streambank Erosion and Habitat Degraded

Subwatershed	Inventoried Streambank Length (feet)	Eroded Sites (feet)	Trampled Sites (feet)	Slumped Sites (feet)	Cattle Access (feet)	Total Sediment Loss Tons/Year	% Bank Degraded From E,T,S	% of Total Bank Erosion in Watershed
Spring Creek	15,840	2,100	3,715	2,445		173	53	100

Source: Rock County LCD

Winter-Spreading of Manure

In the Spring Creek Watershed, winter-spread manure will be addressed before the installation of any manure runoff system or manure storage facility that has state or federal financial assistance. Approximately 8 of the 10 livestock operations in this watershed are eligible for barnyard systems. If the landowner chooses to build any of these facilities, manure spreading management and nutrient management will be incorporated into the total conservation plan for the landowner using the SCS Standard 590.

Figure 3-1 presents a summary of nonpoint sources of sediment and phosphorus in the Spring Creek Watershed.

Pollutant Reduction Goals

Pollutant load reductions are developed according to activities needed to achieve the water quality objectives. The following is a summary of reductions to be targeted for the entire watershed.

Sediment Goal: Reduce overall sediment delivered by 76 percent to meet this goal, the following is needed:

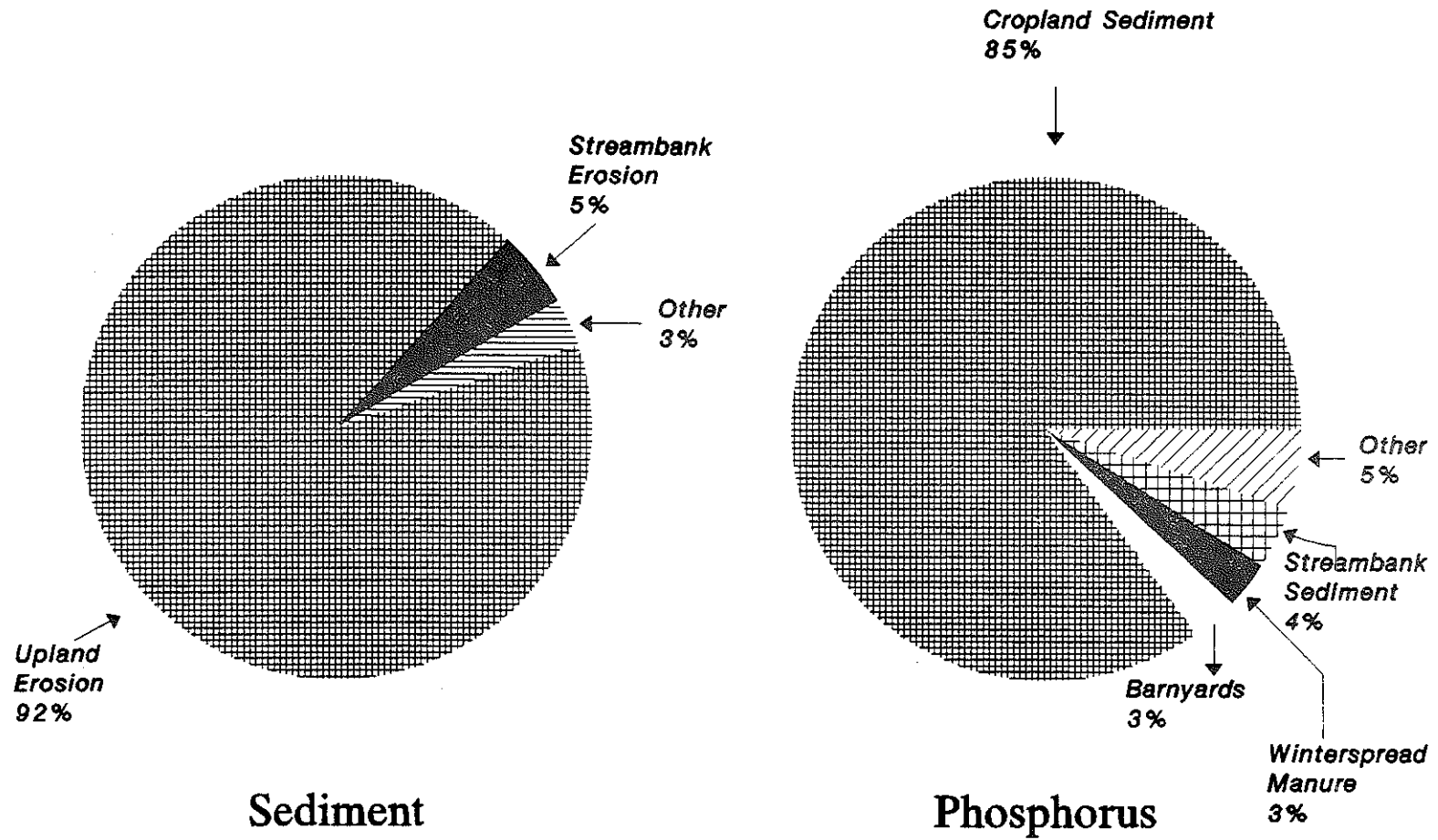
- ★ 78 percent reduction in sediment reaching streams from agricultural uplands by bringing all fields down to "T". This included a 28 percent reduction in sediment delivery which will be realized if half of the existing planned practices are installed.
- ★ 75 percent reduction in streambank sediment delivered to all streams and a 50 percent overall repair of streambank habitat on Spring Creek.

Phosphorus Goal: Reduce overall phosphorus load by 74 percent to meet this goal, the following is needed:

- ★ 85 percent reduction in organic pollutants from barnyards in all subwatersheds.
- ★ 39 percent reduction in organic pollutants from winter-spread manure on "unsuitable" acres in all subwatersheds.

In addition, this plan calls for a restoration of 20 percent of degraded or prior converted wetlands.

Figure 3-1. Nonpoint Sources of Sediment and Phosphorus: Spring Creek Watershed



Sources:

Sediment data was taken directly from nonpoint source inventory.

Other Pollution Sources

Failing Septic Systems

Septic systems consist of a septic tank and a soil absorption field. Septic systems fail due to soil type, location of system, poor design or maintenance. In the Spring Creek Watershed, there have been four failures in the past ten years. This is a relatively high rate of system failures.

Pollutants from septic system discharges are nitrates, bacteria, viruses and hazardous materials from household products.

Rock County has been using the Wisconsin Fund since 1984. The Wisconsin Fund is a Private Sewage System Replacement Grant Program offering financial assistance designed to help eligible homeowners and small business operators offset the costs of replacing a failing septic system. The program is administered by the Rock County Health Department. The grant program applies to principle 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 their county zoning department for more information.

Solid Waste Disposal Sites

There are no active or abandoned landfill sites in the Spring Creek watershed.

Petroleum Storage: Leaking Underground Storage Tank (LUST) Sites

The Wisconsin Remedial Response Site Evaluation Report (PUBL-SW-144-91) lists the sites identified through the LUST program. There are no sites listed within this watershed.

Other Contaminated Sites

The Wisconsin Remedial Response Site Evaluation Report also has the Inventory of Sites or Facilities Which May Cause or Threaten to Cause Environmental Pollution and the Spills Program List which includes sites or facilities identified under the Hazardous Substance Spill Law.

CHAPTER FOUR

Recommended Management Actions: Control Needs and Eligibility For Cost- Share Funding

Introduction

This chapter describes the management actions developed to meet the pollution reduction goals established during the water resource appraisal process. (See page 30 for a summary of identified pollutant reduction goals.) The criteria which determine the eligibility of each pollutant source for cost-share funding through the nonpoint source program are also described in this chapter.

Management Categories

Nonpoint source control needs are addressed by assigning "management categories" to each major nonpoint source pollution site (barnyards, manure spreading, upland fields, streambank and shoreline erosion or streambank habitat degradation sites). Management categories define which nonpoint sources are eligible for financial and technical assistance under the priority watershed project. Categories are based on the amount of pollution generated by a source, and the feasibility of controlling the source. Management category eligibility criteria are expressed in terms of **tons of sediment** delivered to surface waters from eroding uplands and streambanks; **pounds of phosphorus** delivered to surface waters, annually; **the number of unsuitable acres** winter-spread with manure annually; and the feet of streambank trampled by cattle. A definition of each management category is given below. Following this are the criteria used to define the management categories for each pollutant source.

The criteria used to define these management categories must be confirmed at the time that the county staff visit a site. A source may change management categories depending on the conditions found at the time of the site visit. A management category may be revised up to the point that a landowner signs a cost-share agreement. Any sources, created by a landowner, requiring controls after the signing of a cost-share agreement must be controlled at the landowners expense for a period of ten years.

Management Category I

Nonpoint sources included in this category contribute a significant amount of the pollutants impacting surface waters. A reduction in their pollutant load is essential for achieving the water quality objectives in the watershed project.

Nonpoint sources in Category I are eligible for funding and/or technical assistance under the priority watershed project. As a condition of funding, all sources in Management Category I must be controlled if a landowner wishes to participate in any aspect of the watershed project.

Management Category II

Nonpoint sources in this category collectively contribute less of the pollutant load than those in Management Category I. These nonpoint sources are identified and included in cost-sharing eligibility to further insure that water quality objectives for pollutant controls are met. Nonpoint sources in this category are eligible for funding and/or technical assistance under the priority watershed project. Controlling sources in this category is not mandatory for a landowner to be funded for controlling other sources.

Management Category III

Nonpoint sources of pollution in this category do not contribute a significant amount of the pollutants impacting surface waters and are not eligible for funding and/or technical assistance under the priority watershed project. Other Departmental programs (e.g. wildlife and fisheries management) can, if warranted, assist county project staff to control these sources as implementation of the integrated resource management plan for this watershed. Other federal programs may also be applicable to these lands.

Conclusions from the Spring Creek Water Resource Appraisal Report (Marshall, 1993) indicate that the control of sediment is critical to the success of this project. While reduction of phosphorus from all sources is a goal of the project, sediment reduction will be the primary objective of this project.

Criteria for Eligibility and Management Category Designation

Croplands And Other Upland Sediment Sources

Upland Erosion: Upland erosion represents 95 percent (3,347 tons) of the total sediment load to streams in the watershed. A 78 percent reduction in sediment from eroding fields is targeted for agricultural lands. This translates into bringing all lands that are contributing sediment to streams at a rate greater than "T" the tolerable soil loss, down to "T". To be in

Category I, landowners' fields must be eroding at rates greater than "T". This category I will control an estimated 1,911 "critical" acres of cropland, 72 percent of the watershed's upland sediment load (2,542 tons) of the watershed. Refer to table 4-1. Upland Sediment Erosion Criteria in the Spring Creek Watershed.

Table 4-1. Upland Sediment Erosion Eligibility Criteria in the Spring Creek Watershed

Upland Erosion		
Management Category Control	Eligibility Criteria	Soil/Loss (tons/year)
I	Fields above "T"	2,542
II	N/A	N/A
III	Fields Below "T"	

Source: Department of Natural Resources

Gully Erosion

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 critical sediment sources and eligible for cost sharing. Gullies identified through this process will be Category II for eligibility.

See table 4-2 for Croplands Targeted for Sediment Control

Table 4-2. Croplands Targeted for Sediment Control - Spring Creek Watershed

	Total Load (tons/yr)	Management Category I		
		Acres	Control (tons/yr)	Control I (%)
Inventoried	3,241	1,991	2,542	78

Animal Lot Runoff

To achieve the water quality objectives in the Spring Creek Watershed Project, the phosphorus and other pollutants contained in animal lot runoff needs to be controlled at a high level (table 4-4). An 85 percent reduction of animal lot runoff is necessary to meet stated objectives. There are a total of seven surface drainage livestock operations in the watershed. Category I criteria involve operations that produce over 135 pounds of phosphorus per year. These landowners will need to reduce loads down to 10 pounds or less in order to reach the pollutant reduction target. Two barnyard segments fall into this category, yielding 72 percent control. Landowners whose operations produce between 135 and 25 pounds phosphorus are eligible for Category II funding; these operations will also need to reduce their load to 10 pounds or less to be eligible for cost sharing. Three barnyards segments fall into this category, yielding 25 percent control. (table 4-3.)

Table 4-3. Animal Lot Runoff Eligibility Criteria - Spring Creek Watershed

Management Category	Phosphorus Load per Barnyard	Number of Barnyard segments	Pounds Reduced	Per Cent Reduction
I	greater than 135 lbs	2	360	72
II	between 135 and 25 lbs	3	123	25
III	less than 25	-	-	-

Landowners receiving cost sharing for animal lot runoff (Waste Management System, SCS Std. 312) are required to do a nutrient management plan (SCS Std. 590) for their operation. They are eligible for cost-sharing to do so. Eligible Nutrient and Pest Management practices include the development of both nutrient management (SCS Std. 590) and pest management (SCS Std. 595) plans, soil testing and crop scouting.

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

Internally Drained Animal Lots

Three internally drained yards were identified in the Spring Creek Watershed. Eligibility for internally drained animal lots will be determined through field investigations.

Where county project managers are uncertain as to the potential for impact to groundwater caused by an internally drained lot, the field investigations may be conducted jointly by the county project staff, water resource management investigators from the Department's Southern District Office, and staff from the DATCP.

Nutrient and Pest Management

Eligible landowners in the Spring Creek Watershed will be encouraged to participate in a nutrient pest management educational program to change farm management related to over application of nutrients and pesticides. Implementation of this program will take place in two stages. The first stage is developing a waste utilization plan using the 590 standard (without soil tests) to determine the need for manure storage facilities. The counties will develop a professional services contract to have this work done within the first two years of implementation. The waste utilization plans will be submitted to and approved by the Rock County Land Conservation Departments. Records will be kept by the counties showing progress towards reducing the use of fertilizer and pesticides. At the end of the second year of implementation, the counties will be responsible for providing an evaluation to the DNR and DATCP on the effectiveness of this first stage.

The second stage of this program will be the development of nutrient and pest management plans complete with soil tests, crop scouting and farm visits. These plans will follow Soil Conservation Service Nutrient Management Standard 590 and SCS Pest Management Standard 595. A new professional services contract will be established for this purpose. Each landowner is eligible to participate in this stage of the program for one year, and is responsible for paying 50 percent of these consulting fees.

Livestock operations that are Category I & II in table 4-4 (Animal lot runoff) are eligible for this educational program. It is estimated that 1500 acres are eligible for nutrient management and pest management. If all the livestock operations eligible for nutrient and pest management choose to participate in the educational program and they adopt nutrient plans, it is estimated that approximately 500 lbs of phosphorus runoff which is currently reaching surface waters could be controlled.

Table 4-4. Barnyards Targeted for Runoff Control - Spring Creek Watershed

Subwatershed	Total Phos. (lbs)	Management Category I			Management Category II			Management Category III (yards)
		Yards (#)	Control (lbs)	Control (%)	Yards (#)	Control (lbs)	Control (%)	
Spring Creek	500	2	360	72	3	123	25	3

NOTE: This plan assumes that all of the Category I barnyards and half of the Category II barnyards will be controlled, yielding 85 percent control.

The planning of nutrient and pest management practices is closely tied together in their implementation. It is cost effective to develop these plans simultaneously. It is also more cost effective to prevent further ground and surface water degradation now than to try and treat it after damage has occurred. Currently 33 percent of the wells in the Spring Creek Watershed are over the Enforcement Standard for nitrates of 10 ppm.

Like the waste utilization plans, the nutrient and pest management plans will be submitted to and approved by the Rock Conservation Departments. Records will be kept showing progress towards reducing the use of fertilizer and pesticides. An evaluation report to the DNR and DATCP will be required at the end of the implementation of the watershed project.

A landowner in the Nutrient and Pest Management Education Program is not required to comply with Category I practices identified for his/her farm until they receive cost-sharing for other practices.

These nutrient management plans will help to improve manure management and determine if manure storage is necessary.

Manure Storage

Eligibility for a grant for manure storage practices will be based on the Nutrient Management Plan, developed in compliance with SCS standard 590. (table 4-5). A manure storage facility will be considered Category I if the farm operator receives cost-sharing for any item other than those funded under the NPM Educational Program. There is no Category II for manure storage.

Table 4-5 Manure Storage - Spring Creek Watershed

Management Category	Eligibility Criteria
I	Exceeds 590 Standard
III	Does Not Exceed 590 Standard

An operation is eligible if the nutrient management plan demonstrates that manure cannot be feasibly managed during periods of snow covered, frozen and saturated conditions without the installation of storage practices. The nutrient management plan must also demonstrate that proper utilization of the manure can be achieved following adoption of the intended storage practice.

The eligibility for storage facilities will be based on the least cost system that will satisfy the Std. 590 specifications. These options may include manure stacks (in accordance with Std. 312), short term storage (capacity for 30 to 100 days production in accordance with Std. 313), and long term storage (capacity for up to 210 days production in accordance with Std. 313 or 425).

Landowners receiving cost-sharing funds for storage practices or nutrient management 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 NR 120).

Streambanks

Streambank Erosion: Streambanks contribute 5 percent of the overall sediment delivered to streams in the watershed. The goal for streambank erosion control will be to reduce 75 percent of the total tons being delivered from streambanks to Spring Creek. Overall, 130 tons of sediment from streambanks are eligible for control in the Spring Creek watershed. Attention will be given to the most severe sites first. One hundred and sixty-eight of the total 173 tons of streambank sediment are related to the streambanks of one landowner. The goal is to restore fifty percent of the degraded streambank habitat along Spring Creek.

See table 4-6 for streambank eligibility criteria.

Table 4-6. Streambank Eligibility Criteria for the Spring Creek Watershed

Management Category	Criteria
Streambank Erosion	
I	Reduction in total tons delivered by 75%
II	
III	
Streambank Habitat	
I	Reduction in degraded streambank habitat by fifty percent
II	

Sources: Rock County LCD and DNR

Sediment Management Strategy

See table 4-7: Management Strategy for Sediment: All Sources

Table 4-7. Management Strategy for Sediment: All Sources Category I

Subwatershed	Annual Cropland Sediment (tons)	%	Annual Streambank Sediment (tons)	%	Annual ¹ Other Sediment (tons)	%	Total Annual Subwatershed Sediment (tons)	%
	3,241	92	173	5	109	3	3,523	100

Subwatershed	Sediment Control Planned: Cropland (tons)	%	Sediment Control Planned: Streambanks (tons)	%	Total Sediment Control Planned (tons)	%
	2,542	72	130	4	2,672	76

Phosphorus Management Strategy

See table 4-8: Management Strategy for Phosphorus: All Sources

Table 4-8. Management Strategy for Phosphorus: All Sources

Subwatershed	Annual P Loading Barnyards (lbs)	%	Annual P Loading Cropland (lbs)	%	Annual (P) Loading Streambanks (lbs)	%	Annual P Loading Other (lbs)	%	Annual P Winter Spread (lbs)	%	Total P Loading (lbs)	%
	500	3	13,288	85	709	5	588	4	500	3	15,585	100

Subwatershed	P Control Planned Barnyards	%	P Control Planned Croplands	%	P Control Planned Streambanks	%	P Control Planned Winter-Spread	%	Total Planned P Control	%
	425	3	10,422	67	532	3	195	1	11,574	74

Wetland Restoration

There will be no Category I for wetland restoration. All inventoried wetlands (47 sites) will be Category II (eligible) for restoration if the sites meet the criteria on page 41. The targeted goal is to restore 20 percent (10 sites) of the wetlands sites inventoried. See Chapter Two, table 2-3 for wetland inventory details.

Wetland restoration is an eligible best management practice for the purpose of controlling nonpoint sources of pollution. Secondary benefits of wetland restoration may be enhancement of fish and wildlife habitat.

Wetland restoration includes: the plugging or breaking up of existing tile drainage systems, the plugging of open channel drainage systems, other methods of restoring the pre-development water levels of an altered wetland, and the fencing of wetlands to exclude livestock.

Wetland restoration is an eligible practice when applied to 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 riparian to streams, or tributaries.

Eliminating livestock grazing within wetlands will reduce the organic and sediment loading to the wetland and adjacent water resource, and reduce the direct damage to the wetland from the livestock. Livestock exclusion by fencing will control the pollutants and restore the wetland.

3. Prior converted wetlands downslope or upslope from fields identified as Management Category I upland sediment sources through the WIN model.

Restoration of wetlands in these situations will do one of two things: 1) create a wetland filter which reduces the pollutants from an upslope field(s) to a water resource; or 2) reduces the volume and/or velocity of water flowing from an up-slope wetland to a down-slope critical field. Two eligibility conditions must be met to use wetland restoration in this situation:

- a. All upland fields draining to the wetland must be controlled to a soil loss rate that is less than or equal to the soils "T" value.
- b. Within the Spring Creek Watershed wetland restorations of eligible prior converted wetlands will be considered over lower cost practices to control nonpoint source pollutants. The coldwater status of Spring Creek makes it a high priority water resources.

NOTE: In addition to the criteria described above, landowners must control all "Management Category I" sources (through a cost share agreement) to be eligible for an easement through the watershed project.

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
- ★ Critical Area Stabilization
- ★ Wetland Restoration

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 the pollutant reduction function; 2) easements are generally 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.

Within the Priority Watershed Easements should be considered in the following situations:

1. To exclude livestock from grazed wetlands or along eroding stream banks within the watershed. Easements are strongly recommended whenever:
 - ★ there is any grazing of wetlands.
 - ★ livestock density is so great that areas of unvegetated soil are within 60 feet of streams or intermittent streams.
 - ★ Significant reaches (more than fifty feet) of stream bank are severely trampled and eroding.
 - ★ channel erosion is exacerbated by livestock grazing such that unvegetated stream banks 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 strongly recommended whenever:
 - ★ Row cropping is occurring within 60 feet or less of streams or intermittent streams.
3. Easements are strongly recommended to support eligible wetland restorations.
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 when compared to the level of pollution reduction and the price of the available engineering options. Easements are strongly recommended whenever:
 - ★ Engineering options would require intensive management in order to continue to provide adequate pollution reduction.
 - ★ Surrounding land use is largely agricultural and it is anticipated that it will remain so for two decades or more.

NOTE: In addition to the criteria described above, participating landowners must control all "Management Category I" sources (through a cost-share agreement) to be eligible for an easement through the watershed project.

Ordinances

Animal Waste Storage Ordinance

Improperly stored manure can be a significant source of surface or groundwater contamination. Poorly sited and/or designed earthen storage facilities often contaminate groundwater near these facilities. Elevated nitrate-nitrogen is particularly common in groundwater near leaking earthen storage facilities. In Rock County, few regulations exist to protect water resources from the threat of contamination due to animal waste storage and handling.

Properly storing manure entails utilizing certain minimum standards, such as those determined by the USDA Soil Conservation Service, when siting and constructing a manure storage structure. These technical standards provide effective, practical and environmentally safe methods for storing animal waste.

Surface water resources are also at risk with manure storage facilities, when improperly located and/or designed. Manure overflows or a blowout from earthen storage facilities are a serious threat to aquatic life. When above-ground facilities are improperly installed, the potential for system malfunctions increases. Drainage from these facilities can degrade surface water quality unless properly treated. Uncontrolled drainage may also affect groundwater quality, particularly when it occurs in an area with shallow depth to groundwater.

The need for animal waste regulation is evident. More than thirty Wisconsin counties have already adopted ordinances for managing animal waste. Rock County has not enacted animal waste storage ordinances for the protection of surface and groundwater resources.

The Spring Creek Priority Watershed project has brought attention to the need for an animal waste storage ordinance in Rock County.

To help assure the attainment of surface water quality objectives and to protect the groundwater resource, the adoption of an animal waste storage ordinance in Rock County is strongly recommended during the span of the Spring Creek Watershed Project. Certain costs for the development and administration of the ordinance are eligible for reimbursement under the Priority Watershed Project. Rock County Land Conservation Department is recommended to initiate the development of a manure storage ordinance with the intention of adopting an ordinance following the "sign-up" phase of the project (years 1 through 3).

Construction Site Erosion Control Ordinance

The significance of nonpoint source pollution from construction site erosion in the Spring Creek Watershed has been researched. Data was collected on the number of building permits issued per year. The number of permits issued in the watershed area is low. Population

trends over the past decade were reviewed and the population in and around the Spring Creek Watershed has not increased just over the past decade. In light of this information, while the DNR, strongly suggests that Rock County pass an ordinance for preventative reasons, review of existing data reveals that construction sites do not represent a significant pollutant source in the project area at this time to warrant requiring an ordinance for grant eligibility.

The DNR suggests that the Wisconsin Construction Site Erosion Best Management Handbook (DNR Publication WR-222-92) be used as a reference for any development that occurs in the Spring Creek Project.

CHAPTER FIVE

Local Government's Implementation Program

Introduction

This chapter identifies the means for implementing the rural management actions for nonpoint source pollution control described in the previous chapter. The following chapter details the information and education strategy to be implemented. See Chapter 3 for information regarding other pollution sources. The success of this priority watershed project depends on the aggressive implementation of these nonpoint source pollution control strategies.

More specifically this chapter identifies:

- The agencies and units of government responsible for carrying out the identified tasks;
- The best management practices (BMPs) necessary to control pollutants on the critical sites identified in Chapter 4;
- The cost-share budget;
- The cost containment policies;
- The cost-share agreement reimbursement procedures including administrative procedures for carrying out the project;
- Staffing needs including total hours per year and number of staff to be hired;
- Schedules for implementing the project;
- The involvement of other programs;
- The project budget including the expense for cost-sharing; and staffing for technical assistance, administration, and the information and education program;

Project Participants: Roles and Responsibilities

Landowners and Land Operators

Owners and operators of public and private lands are important participants in the priority watershed program. They will adopt BMPs which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources. Land owners and land operators in the Spring Creek Watershed eligible for cost-share assistance through the priority watershed program include: 1) individuals; 2) Rock County; 3) other governmental units described in NR 120.02(19); 4) corporations; and 5) the State of Wisconsin.

Rock County is the primary unit of government responsible for implementing this plan in rural areas.

The Rock County Land Conservation Committee (LCC) will act for the County Board and will be responsible contractually and financially to the State of Wisconsin for management of the project in areas with rural land uses. The County LCC will coordinate the activities of all other agencies involved with the rural portion of the project.

The specific responsibilities for the county are defined in the Wisconsin Administrative Rules, s. NR 120.04, and are summarized below:

1. Identify in writing a person to represent the county during implementation of the project.
2. Contact all owners or operators of lands identified as significant nonpoint sources (Category I) within one year of signing the nonpoint source grant agreement. The county's strategy for contacting landowners is included in this chapter.
3. Develop farm conservation plans consistent with the needs of the project.
4. Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and conditions of cost-share agreements as defined in s NR 120.13, Wisconsin Administrative Code.
5. For lands the county owns or operates, to enter into cost-share agreements with DNR to correct identified nonpoint sources and fulfill their obligations as a cost-share recipient.
6. Design best management practices and verify proper practice installation.
7. Reimburse cost share recipients for the eligible costs of installing BMPs at the rates consistent with administrative rules and established in this plan.
8. Prepare and submit annual work plans for activities necessary to implement the project. The rock County LCD shall submit a workload analysis and grant

application to the Department of Agriculture, Trade and Consumer Protection (DATCP) as required in s Ag. 166.50.

9. Prepare and submit to the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP) the annual resource management report required under s NR 120.21(7) to monitor project implementation by tracking changes in the nonpoint source inventory, and quantifying pollutant load reductions which result from installing BMPs.
10. Participate in the annual watershed project review meeting.
11. Conduct the information and education activities identified in this plan for which they are responsible.

Department of Natural Resources

The role of the Department of Natural Resources (DNR) is identified in s 144.24, Stats. and s NR 120, Wis. Adm. Code. (NR 120) The Department has been statutorily assigned the overall administrative responsibility for the Wisconsin Nonpoint Source Pollution Abatement Program. The Department's role is summarized below.

Project Administration. Project administration includes working with the counties to ensure that work commitments required during the 8-year project implementation phase can be met. The DNR will participate in the annual work planning process with the county.

The Department reviews cost-share agreements signed by the county and the participating landowners for installing BMPs. The DNR provides guidance when questions arise concerning the conformance of proposed activities with the statutes, administrative rules, and the watershed plan.

Financial Support. Financial support for implementation of the priority watershed project is provided to each county in two ways: a local assistance grant agreement, and a nonpoint source grant agreement. These agreements are described later in this chapter.

The DNR may also enter into cost-share agreements directly with local or state units of government for the control of pollution sources on land the governments own or operate.

Project Evaluation. The DNR has responsibility for priority watershed project monitoring and evaluation activities. These efforts determine if changes in water quality occur as best management practices and other pollution controls are installed or implemented. The water quality evaluation and monitoring strategy for the Spring Creek Watershed is included in Chapter 8. The DNR documents the results of monitoring and evaluation activities in interim and final priority watershed project reports.

Technical Assistance. The DNR provides technical assistance to the county on the design and application of best management practices. This assistance is primarily for urban areas.

Other Responsibilities. These include:

1. The appropriate District Nonpoint Source Coordinator to arrange for DNR staff to assist county staff with site reviews to determine the impacts of nonpoint sources on wetlands and/or groundwater quality.
2. Assisting county staff to integrate wildlife and fish management concerns into the selection and design of BMPs.

Department of Agriculture, Trade and Consumer Protection

The role of the Department of Agriculture, Trade and Consumer Protection (DATCP) is identified in s 144.25, stats., ch. 92 stats., and NR 120. In summary, the DATCP will:

1. Manage a training program for the staff involved with project implementation.
2. Cooperate with the University of Wisconsin - Extension to act as a clearinghouse for information related to agricultural best management practices, sustainable agriculture, and nutrient and pest management.
3. Assist the counties to carry out the information and education activities or tasks described in this plan.
4. Assist county staff to identify watershed participants subject to federal or state conservation compliance programs.
5. Assist counties, if requested, to develop a manure storage ordinance.
6. Assist county staff to complete annual workload analyses and grant applications for work conducted under the priority watershed project.
7. Participate in the annual project review meetings.
8. If the need arises, assist in developing technical standards for agricultural BMPs, and provide technical assistance to county staff concerning application of these practices.
9. Assist county staff to evaluate the site specific practicality of implementing rural best management practices.
10. Provide technical and engineering assistance to counties for agricultural BMPs.

Other Agencies

The Spring Creek Priority Watershed Project will receive assistance from the agencies listed below.

Soil Conservation Service (SCS)

This agency works through the local LCC to provide technical assistance for planning and installing conservation practices. The local SCS personnel will work with the county staff to provide assistance with technical work when requested by the Land Conservation Committee and if SCS staff time is available. Personnel from the Area SCS office will provide staff training and engineering assistance for best management practices. Efforts will be made by DATCP to assist SCS to coordinate the Spring Creek Priority Watershed Project with the conservation compliance and other conservation provisions of the 1985 and subsequent Federal Farm Bills.

University of Wisconsin Extension (UWEX)

County and Area Extension agents will provide support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project. This will include assistance to carry out the information and education activities identified in this plan.

Agricultural Stabilization and Conservation Service (ASCS)

ASCS administers most of the federal programs aimed at the stabilization of the prices paid producers for agricultural products and administers federal funds for rural soil and water and other resource conservation activities. The Agricultural Conservation Program (ACP) which is administered by ASCS will, to the extent possible, be coordinated with the Spring Creek Priority Watershed Project. In addition other conservation incentives such as the Conservation Reserve Program (CRP) will be used whenever possible to control critical nonpoint sources of pollution.

Agricultural Best Management Practices (BMPs)

BMPs Eligible For Cost-Sharing And Their Rates

Best management practices are those practices identified in NR 120 which are determined in this watershed plan to be the most effective controls of the nonpoint sources of pollution. The practices eligible for cost-sharing and the cost share rates for each BMP are listed in tables 5-1 and 5-2.

Table 5-1. State Cost-share % Rates for Best Management Practices¹

BEST MANAGEMENT PRACTICE	STATE COST SHARE RATE
Field Diversions and Terraces	70%
Grassed Waterways	70%
Critical Area Stabilization	70% ²
Shoreline Buffers	70% ²
Wetland Restoration	70% ²
Shoreline and Streambank Stabilization	70% ²
Grade Stabilization Structures	70%
Agricultural Sediment Basins	70%
Barnyard Runoff Management	70%
Animal Lot Relocation	70%
Manure Storage Facilities	70% ³
Livestock Exclusion from Woodlots	50%
Nutrient and Pesticide Management	50% ⁴

¹ Table 5-2 shows BMPs cost shared at a flat rate.

² Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs. See Chapter 4 for an explanation of where easements may apply.

³ Maximum cost share amount is \$20,000 for manure storage.

⁴ Spill control basins have a state cost share rate of 70%.

Table 5-2. BMPs Using a Flat Rate for State Cost-Share Funding

BEST MANAGEMENT PRACTICE	FLAT RATE
Contour Farming	\$ 6.00/ac (1)
Contour Stripcropping	\$ 12.00/ac (1)
Reduced Tillage	\$ 45.00/ac (2)
Reduced Tillage	\$ 15.00/ac (3)

Design and installation of all BMPs must meet the conditions listed in NR 120. Generally these practices use specific standard specifications included in the SCS Field Office Technical Guide. In some cases additional specifications may apply. The applicable specifications for each BMP can be found in NR 120.14. The Department may approve alternative best management practices and design criteria based on the provisions of NR 120.15 where necessary to meet the water resource objectives. Regarding alternative agricultural BMPs, this approval is developed in consultation with DATCP.

If the installation of BMPs destroys significant wildlife habitat, 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.

1. Wildlife habitat restoration components of this practice are cost-shared at 70%.
2. \$45 per acre over 3 years for reduced tillage on continuous row croplands.
3. \$15 per acre for one year only for reduced tillage on crop rotations involving hay.

Following is a brief description of some of the most commonly used BMPs included in table 5-1 and 5-2. A more detailed description of these practices can be found in 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. All operations from seed bed preparation to harvest are done on the contour.

Reduced Tillage

A system which leaves substantial amounts of crop residue on the soil surface after crops are planted. The minimum amount of ground cover after planting shall be at least 30%. 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.

Critical Area Stabilization

The planting of suitable vegetation on critical nonpoint source sites and other treatment necessary to stabilize a specific location.

Grassed Waterways

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

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.

Livestock Exclusion from Woodlots

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

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. This practice includes streambank rip-rap, streambank shaping and seeding, stream crossings, livestock watering, fencing and fish habitat structures. This practice may also include plans and practices to manage or exclude livestock.

Terraces

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

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.

Barnyard Runoff Management

Structural measures such as filter systems and/or diversions and rain gutters to redirect surface runoff around the barnyard, and collect, convey or temporarily store runoff from the barnyard.

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.

Agricultural Sediment Basins

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

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.

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.

Wetland Restoration

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

Nutrient Management

The management and crediting of nutrients for the application of manure and commercial fertilizers, and crediting for nutrients from legumes. 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 and Spill Control Basin

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 and spill control basins with liquid-tight floors for pesticide handling areas.

Easements

Although not considered to be Best Management Practices, easements are useful legal tools and their applicability is defined in Chapter 4, Management Actions. Details for such arrangements will be worked out between DNR and the counties during the implementation phase.

Alternative Best Management Practices

- Abandonment of leaking and improperly sited manure storage systems: Proper abandonment of leaking and improperly sited manure storage systems will aid in the protection of water resources from contamination by animal waste. The practice includes proper removal and disposal of wastes, liner materials, and saturated soil as well as shaping, filling, and seeding of the area.
- Rotational Grazing: A grazing management scheme that divides the pasture into multiple cells (usually 5 to 30) that receive a short but intensive grazing period followed by a recovery period of approximately 28 days. Rotational grazing increases pasture production while enhancing a dense, stable vegetative cover. Practice will be limited to one trail in the watershed and will then be evaluated before potentially expanding use.

BMPs Not Cost-Shared

BMPs not cost-shared, but which shall be included on the cost share agreement if necessary to control the nonpoint sources, are listed in NR 120.17. Several examples are included below.

- 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 and other activities normally and routinely used in growing crops or which have installation costs that can be passed on to potential consumers.
- Changes in location of unconfined manure stacks involving no capital cost.
- Manure spreading management.
- Other activities the DNR and the Counties determine are necessary to achieve the objectives of the watershed project.

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 NR 120.10(2). The following is a partial list of ineligible activities most often inquired about for cost-sharing in rural areas.

- 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) Program 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 which were adequately controlled at the time the cost-share agreement was signed, with the exception of those that occur 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 and 5-3a. The capital cost of installing the BMPs are listed in this table assuming landowner participation rates of 100 percent and 75 percent. Also included are the units of measurement and cost per unit for the various BMPs.

The capital cost of installing the Best Management Practices is approximately \$494,158, assuming 100 percent participation.

State funds necessary to cost-share this level of control would be about \$356,809.

The local share provided by landowners and other cost-share recipients would be about \$137,349.

At a 75 percent level of participation, the state funds needed to cover capital installation would be about \$267,607.

Easement Costs

Chapter 4 identifies where nonpoint source program funds can be used to purchase easements. The estimated cost of purchasing easements on eligible lands in Rock County is shown in Table 5-3. At 100 percent participation, the estimated purchase price of easements on eligible lands would be \$75,000. At 75 percent participation, the cost would be \$56,250. The easement costs would be paid for entirely by the state. However, it is very difficult to

Table 5-3. Cost-Share Budget Needs for Rural Management Practices in Rock County

Best Management Practices	Number		Cost/Unit	Total Cost (1)	100% Participation		75% Participation	
					State	Local	State	Local
					Share	Share	Share	Share
Upland NPS Control								
Change in Crop Rotation	500	ac	NA (2)	0	0	0	0	0
Contour Cropping	750	ac	\$6	4,500	120	0	3,375	0
Contour Strip Cropping	80	ac	\$12	960	960	(3)	720	(3)
Reduced Tillage (4)	1000	ac	\$45	45,000	45,000	0	33,750	0
Reduced Tillage (5)	550	ac	\$15	8,250	8,250	0	6,188	0
Critical Area Stabilization	10	ac	\$300	3,000	2,100	900	1,575	675
Grass Waterways	26	ac	\$2,800	72,800	50,960	21,840	38,230	16,380
Field Diversions & Terraces	2,000	ft	\$3	6,000	4,200	1,800	3,150	1,350
Grade Stabilization	1	ea	\$3,000	3,000	2,100	900	1,575	675
Agricultural Sediment Basin	1	ea	\$10,000	10,000	7,000	3,000	5,250	2,250
Shoreline Buffers	10	ac	\$200	2,000	1,400	600	1,050	450
Wetland Restoration	5	ea	\$3,000	15,000	10,500	4,500	7,875	3,375
Livestock Exclusion, Woods	50	rods	\$14	700	700	(3)	525	(3)
Spill Control Basins	1	ea	\$15,000	15,000	10,500	4,500	7,875	3,375
Animal Waste Management								
Barnyard Runoff Control								
Complete System	5	ea	\$22,500	112,500	78,750	33,750	59,063	25,313
Roof Gutters	6	ea	\$1,200	7,200	5,040	2,160	3,780	1,620
Clean Water Diversion	4	ea	\$1,500	6,000	4,200	1,800	3,150	1,350
Manure Storage Facility (6)	1	ea	\$30,000	30,000	10,000	20,000	7,500	15,000
Streambank Erosion Control								
Shape and Seeding	4,000	ft	\$12	48,000	33,600	14,400	25,200	10,800
Fencing	850	rods	\$25	21,250	21,250	(3)	15,938	(3)
Rip-Rap/ Lunkers	1,000	ft	\$60	60,000	42,000	18,000	31,500	13,500
Livestock/Machinery								
Crossing/Watering Ramp	3	ea	\$2,500	7,500	5,250	2,250	3,938	1,688
Remote Watering Systems	2	ea	\$2,000	4,000	2,800	1,200	2,100	900
Subtotal:				\$482,660	\$351,060	\$131,600	\$263,295	\$98,700
Easements	50	ac	\$1,500	75,000	75,000	0	56,250	0
TOTALS				\$557,660	\$426,060	\$131,600	\$319,545	\$98,700

- (1) Total cost to control identified critical pollution sources
- (2) NA means that cost share funds are not available for this practice
- (3) Local share consists of labor and any additional equipment costs, also see flat rates
- (4) Reduced tillage on greater than three years continuous row crops
- (5) Reduced tillage, including no-till, on rotations including hay
- (6) Maximum cost-share is \$20,000

Source: WI Department of Natural Resources; WI Department of Agriculture, Trade and Consumer Protection; and the Land Conservation Department of Rock County

Table 5-3a. Professional Services Contract for Nutrient/Pest Management Budget Needs for Rural Management Practices in Rock County

Best Management Practices	Number	Cost/Unit	Total Cost (1)	100% Participation		75% Participation	
				State	Local	State	Local
				Share	Share	Share	Share
Nutrient Management	750 ac	\$6	4,500	3,150	1,350	2,363	1,013
Nutrient & Pest Management	750 ac	\$10	7,500	5,250	2,250	3,938	1,688

(1) Total cost to control identified critical pollution sources

Source: WI Department of Natural Resources; WI Department of Agriculture, Trade and Consumer Protection; and the Land Conservation Department of Rock County

determine landowner response to easements as a management tool. Easements are a relatively new tool in the Priority Watershed Program. Therefore, it is very difficult to estimate cost.

Cost Containment

Cost Containment Procedures

Chapter NR 120 requires that cost containment procedures be identified in this plan.

Cost-share payments will be based on actual installation costs. If actual installation costs exceed the amount of cost-sharing determined by the bidding, range of costs, and average cost methods the amount paid the grantee may be increased with the approval of the County land conservation committee. Appropriate documentation regarding the need for changes will be submitted to DNR.

Bids, Average Costs, and Flat Rates

The cost containment procedures to be used by Rock County are described in their average cost list, and flat rate list. These have been approved by the DATCP and DNR. Copies of the lists can be obtained from the county LCD. If these procedures or lists change, they are subject to approval by DATCP and DNR.

Average costs have been determined through experience in the County. The average cost list will be reviewed periodically and appropriate changes made. If changes are made, the list will be forwarded to the DNR and the DATCP for final approval before the changes are used for calculating cost share agreements and payments.

BMPs using flat rates are shown in table 5-2. The rates shown are the state's share of the practice installation costs.

Cost-Share Agreement Reimbursement Procedures

Nonpoint Source Grant Agreement and Administration

General Information

The Nonpoint Source Grant Agreement is the means for transmitting funds from the DNR (through the Nonpoint Source Program) to Rock County for use in funding the state's share of cost share agreements. Cost share agreements are the means to transmit funds from the county to the landowners.

A portion of the Nonpoint Source Grant is forwarded to Rock County to allow the county to set up an "up front" account. Funds from this account are used by the county to pay landowners after practices are installed through the project. As this account is drawn down, the county will request reimbursements from DNR to replenish the account. The county will submit reimbursement requests on a quarterly basis or sooner if needed. This reimbursement schedule will insure that the "up front" account balance is maintained at an adequate level. The Nonpoint Source (NPS) Grant Agreement will be amended annually to provide funding needed for cost sharing for the year. The funds obligated under cost share agreements must never exceed the total funds in the NPS Grant Agreement.

Fiscal Management Procedures, Reporting Requirements

Counties are required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Spring Creek Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26.

Cost Share Agreement and Administration

Purpose and Responsibilities

Consistent with s 144.25, Stats. and NR 120, Wis. Adm. Code, cost-share funding is available to landowners for a percent of the costs of installing BMPs to meet the project objectives. Landowners have three years after formal approval of the watershed plan to enter into cost-share agreements (CSA). Practices included on cost-share agreements must be installed within the schedule agreed to on the cost-share agreement. Unless otherwise approved, the schedule of installing BMPs will be within 5 years of signing of the cost-share

agreement. Practices must be maintained for a minimum of ten years from the date of installing the final practice included in the cost-share agreement.

The cost-share agreement is a legal contract between the landowner and the county. The agreement includes the name and other information about the landowner and grant recipient, conditions of the agreement, the practices involved and their location, the quantities and units of measurement involved, the estimated total cost, the cost share rate and amount, the timetable for installation, and number of years the practice must be maintained. The agreements also identify and provide information on practices not cost-shared through the nonpoint program but that are essential to controlling pollution sources (such as crop rotations). These items will be completely listed in the conservation plan and the conservation plan is tied to the CSA via addendum 2 of the CSA. Once it is signed by both parties, they are legally bound to carry out the provisions in it.

If land ownership changes, the cost-share agreement remains with the property and the new owner is legally bound to carry out the provisions. NR 120.13(9) and (10) has more information on changes of land ownership and the recording of cost-share agreements.

Local, state, or federal permits may be needed prior to installation of some BMPs. The areas most likely to need permits are zoned wetlands and the shoreline areas of lakes and streams. These permits are needed whether the activity is a part of the watershed project or not. Landowners should consult with the County Planning and Zoning Department or the Land Conservation Department offices to determine if any permits are required. The landowner is responsible for acquiring the needed permits prior to installation of practices.

The cost-share agreement binds the county to provide the technical assistance needed for the planning, design, and verification of the practices on the agreement, and to provide the cost-share portion of the practice costs.

Counties are responsible for enforcing compliance of cost-share agreements to which they are a party. Where DNR serves as a party to an agreement with a unit of government, the DNR will take responsibility for monitoring compliance. The responsible party will insure that BMPs installed through the program are maintained in accordance with the operation and maintenance plan for the practice for the appropriate length of time. Rock county will check for compliance with practice maintenance provisions once every three years after the last practice has been installed. The county must check maintenance at its own expense after the Nonpoint Source Agreement has lapsed, unless state funding for this activity becomes available at any time during the implementation or monitoring phase of this project.

Landowner Contact Strategy

The following procedure will be used to make landowner contacts.

- During the first three months of the implementation period, 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 (Management Category I). These contacts will occur within the cost-share sign-up period.
- The county will continue to make contacts with eligible (Management Category I and II) landowners and operators until they have made a definite decision regarding participation in the program.
- The county will contact all eligible landowners (as defined above) not signing cost-share agreements by personal letter six months prior to the end of the cost-share sign-up period.

Procedure for Developing a Cost Share Agreement

Eligibility for cost-sharing is verified following a site visit, using the criteria described in Chapter 4.

The development of farm conservation plans will be the primary method used to develop cost-share agreements. These plans are specific to a particular landowner and are a comprehensive approach to the abatement of the nonpoint sources of pollution, and the conservation of soil and other resources. The farm plan takes into consideration the sustainability of the agricultural resources and the management decisions of the owner or operator.

The cost share agreement specifies the items listed in the farm conservation plan that are necessary to reduce the nonpoint sources of pollution. The conservation plan and cost share agreement will document existing management which must be maintained to protect water quality.

The following procedure will be used by the county for developing and administering agreements. Below are the steps from the initial landowner contact through the completion of BMP maintenance.

- Landowner and county staff meet to discuss the watershed project, NPS control practice needs, and coordination with conservation compliance provisions if applicable.
- Landowner agrees to participate with the watershed project.
- A farm conservation plan is prepared by the county.
- The landowner agrees with the plan, a Cost Share Agreement is prepared and both documents are signed by the landowner and the county. A copy of the Cost Share Agreement (CSA) is sent to the DNR Western District Nonpoint Source Coordinator and a copy given to the landowner. The CSA will be recorded by the county with the County Register of Deeds.

- Practices are designed by the county, or their designee, and a copy of the design is provided to the landowner.
- Landowner obtains the necessary bids or other information required in the cost containment policy.
- Amendments to the CSA are made if necessary.
- The county staff oversee practice installation.
- The county verifies the installation.
- The landowner submits paid bills and proof of payment (canceled checks or receipts marked paid) to the county.
- Land Conservation Committees or their designated representative and if required, county boards, approve cost-share payments to landowners.
- Checks are issued by the county to the respective landowners and project ledgers are updated.
- The county records the check amount, number, and date.
- DNR reimburses the county for expended cost-share funds.

Identifying Wildlife and Fishery Needs

The Rock County staff will consult with DNR's Southern District wildlife management and fisheries management staff to optimize the wildlife and fish management benefits of nonpoint source control BMPs. Specifically, the county staff will contact DNR staff if in the county's opinion: Fence rows, rock piles, wetlands, or other wildlife habitat components will be adversely affected by installation of agricultural BMPs.

The DNR staff will assist county staff at the County's request by:

- Identifying streambank protection practices that benefit fish and wildlife.
- Identifying wildlife habitat components that could be incorporated into vegetative filter strips along streams or in upland areas.
- Reviewing placement of agricultural sediment basins to assure that negative impacts on stream fish and aquatic life do not occur and recommending wildlife habitat components.
- Providing technical assistance when the installation of BMPs will require the removal of obstructions or other wildlife habitat by proposing measures to minimize impact on wildlife habitat.

- Assisting to resolve questions concerning effects of agricultural nonpoint source BMPs on wetlands.

Submittal to the Department of Natural Resources

Cost-share agreements do not need prior approval from DNR, except in the following instances:

- where cost-share funds are to be used for practices on land owned or controlled by the county.
- for agreements or amendments where the cost-share amount for all practices for a landowner exceeds \$50,000 in state funds.
- for grade stabilization structures and agricultural sediment basins with embankment heights between 15 and 25 feet and impoundment capacities of 15 to 50 acre feet.
- for streambanks to be controlled using riprap or other materials with banks over 6 feet high, according to NR 120.14. If applications are similar to each other in content, they will be reviewed to determine if future applications need be subject to this approval procedure.
- for animal lot relocation.
- for roofs over barnyards or manure storage facilities.

Local Assistance Grant Agreement Administration

General Information

The Local Assistance Grant Agreement (LAGA) is a grant from the DNR to Rock County for staff and support costs. Consistent with NR 120, the counties will use funds from the LAGA for staff to implement the project and conduct information and education activities. Other items such as travel, training, and certain office supplies are also supported by the LAGA. Further clarification of eligible costs supported by this grant is given in NR 120.14(4) and (6).

Grant Agreement Application Procedures

An annual review of the Local Assistance Grant Agreement is conducted through the development of an annual workload analysis by the county. This workload analysis estimates the work needed to be accomplished each year. The workload analysis is provided to DATCP and DNR for review and clarification. Along with the workload analysis, a grant application form is sent. Funds needed to complete the agreed upon annual workload are amended to the local assistance grant agreement.

Fiscal Management Procedures, Reporting Requirements

Rock County is required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Spring Creek Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26. NR 120 requires quarterly reports to DATCP from the county in accordance with s Ag. 166.40(4) accounting for staff time, expenditures, and accomplishments regarding activities funded through the watershed project. Reimbursement requests may be included with the submittal of the quarterly project reports.

Staffing Needs

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

Table 5-4 lists the total estimated staff needed to implement the project. Figures are provided for both the 50% and 75% levels of participation. A total of about 9,290 staff hours are required to implement this plan at a 75% landowner participation rate. This includes 960 staff hours to carry out the information and education program.

Currently, one half-time staff position is being funded on the Spring Creek watershed project. The county and agencies will determine the need for additional staff based on the annual Workload Analysis. The county will assess the number and type of staff required for the final five years of the project based on the actual landowner participation following the three year cost-share sign-up period.

Staffing Costs

The estimated cost for staff at the 75 percent participation rate (see table 5-5) is approximately \$183,785. These costs will be paid by the state through the Local Assistance Grant Agreement.

Table 5-4. Estimated County LCD Staff Needs for Project Implementation

Activity	Project Years When Work Will Be Done	ROCK COUNTY	
		75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)
Project and Financial Management	1-8	1,200	1,200
Information and Education Program	1-8	960	960
Pre-Contact Office Inventory; Landowner Contracts and Progress Tracking	1-3	300	200
Conservation Planning and Cost- Share Agreement Development	1-3	700	467
Plan Revisions and Monitoring	1-8	320	213
Practice Design and Installation	1-8		
Upland Sediment Control		3,900	2,600
Animal Waste Management		560	375
Streambank Erosion Control		500	350
Easements			
Training	1-8	850	850
Total LCD Workload:		9,290	7,215
Estimated Staff Required for Years 1-3:		0.8 per year	0.6 per year
Hours		1,584 per year	1,215 per year
Estimated Staff Required for Years 4-8:		0.6 per year	0.4 per year
Hours		1,150 per year	902 per year

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Rock County Land Conservation Department

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

Item	Costs (State Share)	
		Table 5-3
Cost-Share Funds: Practices	\$263,295	75% participation, state share
Cost-Share Funds: Easements	\$56,250	75% participation, state share
Local Assistance Staff Support	\$183,785	total LCS workload x \$17.50
Information/Education Direct Professional Service Contract for Nutrient Management Stage I (\$.90/ac' 1500 ac)	\$4,000 \$1,350	From I & E chapter does not include staff
Stage II	\$4,312	
Other Direct (travel, supplies, etc.)	\$6,400	from county's calculations
Engineering Assistance	\$0	from county's calculations
Total	\$519,392	

* Salary + Indirect = \$36,400/year

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Rock County Land Conservation Department

Schedules

Grant Disbursement and Project Management Schedule

Implementation may begin upon approval of this watershed plan by the Rock County Board; Wisconsin Department of Agriculture, Trade and Consumer Protection; and the Wisconsin Department of Natural Resources. The priority watershed project implementation period lasts eight years. It includes an initial three year period for contacting eligible landowners and signing cost-share agreements. Practices on any cost-share agreement must be installed within a five years of signing the CSA.

Under extenuating circumstances, the initial period for entering into cost-share agreements can be extended by DNR for a limited period of time if it will result in a significant increase in nonpoint source control. Limited extensions for the installation period for practices on individual cost-share agreements must also be approved by DNR and DATCP.

The disbursement of the grants (Local Assistance and Nonpoint Source) to Rock County will be based on an annual workload analysis and grant application process. The estimated grant disbursement schedule based on 75 percent participation by eligible landowners can be found in table 5-6.

Table 5-6. Grant Disbursement Schedule at 75% Landowner Participation

Item	Project Year				
	1	2	3	4 - 8	Total
Cost-Share Funds: Practices	\$52,659	\$105,318	\$105,318	\$0	\$263,295
Cost-Share Funds: Easements	11,250	22,500	22,500	0	\$56,250
Local Assistance Staff Support	27,720	27,720	27,720	100,625	\$183,785
Information/Education: Direct	667	667	667	2,000	\$4,000
Professional Services Contract for Nutrient/Pest Mgmt					
Stage I	1,350				\$1,350
Stage II	2,156	2,156			\$4,312
Other Direct: (travel, supplies, etc.)	1,280	1,280	1,280	2,560	\$6,400
Engineering Assistance	0	0	0	0	\$0
TOTAL	\$97,082	\$159,641	\$157,485	\$105,185	\$519,392

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Rock County Land Conservation Department

Total Project Cost

The total state funding required to meet the rural nonpoint source pollution control needs at a 75% level of landowner participation is presented table 5-5. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated cost to the state is \$519,392 and the estimated cost to landowners and others is \$103,012.

This cost estimate is based on projections developed by the agency planners and Land Conservation staff. Historically, the actual expenditures for projects are less than the estimated costs. The factors affecting expenditures for this watershed project include: the time it takes to plan the project; the length of time the project is under implementation; the amount of cost sharing that is actually expended; the number of staff working on the project; the amount of support costs; and the time local assistance is necessary.

Involvement of Other Programs

Coordination With State and Federal Conservation Compliance Programs

The Spring Creek 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 Soil Conservation Service. DATCP will assist the LCD and the SCS 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 on December 31, 1989. FPP conservation plans by were completed December 31, 1991. There are 18 FPP plans and 13 FSA plans 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 SCS staff of changes in plans resulting from management decisions and the installation of needed BMPs for nonpoint source pollution abatement. This comprehensive approach to farm planning will facilitate consideration of the various goals and objectives for all the programs in which the landowner participates.

Eroding uplands in management Category I may need control, in addition to that required for meeting soil loss targets, in order to meet soil erosion program goals established through other state and federal programs. Where this occurs, technical and financial assistance from the Nonpoint Source Program can be used to support practice design and installation on these critical lands. This assistance applies only where the additional control needed to meet soil erosion goals can be achieved using low cost practices.

CHAPTER SIX

Information and Education Program

Goals

The goal of the Information and Education (I&E) plan is to develop a local citizenry that is knowledgeable about both the problem of nonpoint source pollution and the Spring Creek Priority Watershed Program and willing and able to reduce their contribution to surface and ground water pollution. Refer to table 6-1 for a summary of I & E tasks.

Objectives

1. Local landowners will be aware of the impact of nonpoint source pollution on Spring Creek and knowledgeable of how these impacts affect themselves and the natural environment.
2. Local landowners will be knowledgeable of those practices used on their farmland that effects water quality and what actions will reduce the amount of pollution resulting from these practices.
3. Local landowners will be aware, knowledgeable and able to implement best management practices (BMPs), promoted by the watershed project which reduce nonpoint source pollutants.
4. Local landowners will be aware and knowledgeable of habitat concerns within the watershed and willing to participate in programs that improve fish and wildlife habitat.
5. Local residents will be aware and knowledgeable of the purpose and operation of the Spring Creek Priority Watershed Program and will have an appreciation of its benefits to the area.

The accomplishment of the above objectives will lead to a maximization of landowner participation with the NPS program resulting in improved riparian habitats and water quality.

Audience

The primary audience of the I&E plan are local landowners involved in agriculture who are eligible for project participation. This is a small watershed with out urban or suburban development.

Delivery Team

Primary responsibility will be the Project Manager working with the University of Wisconsin-Extension Area Water Quality I&E Specialist.

Activities

Farm Visits & Information Packet

Description: The majority of the I&E efforts will consist of one on one meetings between the Land Conservation Department Staff and the landowner. During these meetings project staff will discuss the project, the water quality concerns and which activities would lead to water quality improvement. To help further educate and inform the landowner about the problems of nonpoint source pollution, the specifics of the program and BMPs being promoted through the project, the Project Manager and the Area Water Quality Specialist will develop a landowner's informational packet to use during farm visits. The packet will include Extension NPS publications of local interest, nutrient management materials, and fact sheets developed specifically for Spring Creek concerns.

To help develop and encourage program recognition project staff will distribute promotional materials such as pens and hats during the farm visits.

Schedule:

- 1) Farm Visits, Greatest emphasis during signup but will include visits during implementation and concluding with a final meeting after completion of installed practices.

Responsibility: Rock County LCD Staff

No extra costs.

- 2) Information Packet, To be developed Fall 1993 and updated as necessary.

Responsibility: Project Manager and Area Water Quality Specialist

Costs: \$200 for binders, fact sheets and miscellaneous.

3) Promotional Materials: Pens and hats ordered spring 1993.

Responsibility: Project Manager

Newsletters

Description: Since this is a small watershed, traditional newsletters will not be emphasized, instead project information and upcoming events will be communicated through personalized letters. Newsletters will be used to provide critical project updates or to highlight project successes.

Schedule: Three mailings per year minimum first three years, once per year during implementation

Responsibility: Project Manager and Area Water Quality Specialist

Cost: \$25 postage/ mailing (\$325), \$300 for film and developing stationary, envelopes, etc.

Annual Field Day and Watershed Meeting

Description: An annual field day, to demonstrate conservation practices, will be held in conjunction with an annual watershed picnic. This schedule will allow landowners to see project activities, hear the benefits of the program from each other and exchange ideas. The picnic will also provide an opportunity to recognize participating landowners.

Schedule: Fall, throughout implementation period

Responsibility: Project Manager

Costs: 40 people/year at \$10/person plus \$200 miscellaneous and recognition awards.

Display

Description: A project display will be completed and used at the Rock County Fair as well as at other field days held in the County.

Schedule: Display completed by late summer, 1993. Exhibited at County Fair annually through implementation.

Responsibility: Project Manager

Cost: \$150 for photographic enlargements and replacement maps and graphics.

Streambank Habitat Improvement

Description: Trout Unlimited and Pheasants Forever have expressed interest in working on habitat improvement within the watershed. This coalition between landowners, the watershed project and conservation groups will provide an opportunity to educate both the landowners and the conservation club members about the problem of NPS pollution, methods for reducing the problem and on how cooperation between two groups can lead to benefits for everyone. This activity will include providing opportunity for discussions between groups, making presentations at conservation club meetings and working with the conservation groups to implement habitat improvement.

Schedule: Throughout project

Responsibility: Project Manager

Cost: \$600.00 to cover development of slide program, other materials as necessary for projects and attendance by project manager at annual meetings.

Summary of I & E Tasks

Table 6-1. Information and Education Budget and Staff Needs

Activity	Total Number	Total Direct Costs	Required Staff Hours			
			Years 1-3		Years 4-8	
Information Packet	1	200	10 20	cty UWEX	0	
Farm Visits			* Done along with other duties			
Newsletters (Mailings)	13	625	54 15	cty UWEX	30 10	cty UWEX
Annual Field Day/ Public Informational Meeting	13	2,800	72 30 120	pr.man UWEX LCD	120 50 200	
Display	1	150	90 10	cty UWEX	150	cty
Streambank Improvement		600**	100 8	cty UWEX	100	cty
Total		\$4,375.00				

** Includes cost to attend annual meetings

CHAPTER SEVEN

Integrated Resource Management Program

Introduction

The purpose of this chapter is to define the principles and guidelines for assuring that the watershed project is coordinated with other resource management programs, organizations, and activities. Each of these activities is described below.

Fisheries

Watershed best management practices (BMPs), such as streambank protection, shoreline buffer strips, and easements, should be implemented in such a way that will enhance fishery management goals. Specifically, all streambank protection BMPs should be installed in such a way that fisheries habitat is enhanced. Large diameter-sized rock should be used below the water line. Rock riprap should be installed and sized so that the placement and size of rock will positively benefit trout habitat. The fishery manager should be consulted for input in the design of each streambank protection BMP.

Wetland Restoration

Significant amounts of restorable wetland areas exist in this watershed. The general guidelines for wetland restoration, easement acquisition, and shoreline buffers to protect existing wetlands should be followed. Wetlands that are important wildlife habitats will be identified by the U.S. Fish and Wildlife Service in consultation with the Department of Natural Resources (DNR) private lands manager. Shoreline buffer easements may be acquired adjacent to these wetlands to better protect them from sedimentation and other nonpoint source pollution.

These wetlands (existing and restorable) were identified in the wetlands inventory conducted by the Rock County Land Conservation Department (LCD). In addition to the normal priority watershed funding, additional cost-sharing may be available to provide for a 100 percent payment for installation of the BMP. This additional funding may be available

through the DNR district private lands manager, and/or the U.S. Fish and Wildlife Service. Eligibility for this additional funding would be determined by the DNR's private lands manager or the district nonpoint source coordinator.

The Fish and Wildlife service is interested in working with private landowners, conservation agencies and other units of government to restore drained and altered wetlands through their "Partners for Wildlife" program.

The Fish and Wildlife Service "Partners for Wildlife" program can contribute both technical and financial support for wetland restoration efforts in the Spring Creek Watershed.

Riparian Zones

Where possible, riparian zones along creeks should be protected with fencing to protect them from livestock grazing and trampling. These can be acquired through easements so that they receive lasting protection. These areas are important wildlife habitats, particularly for wood ducks.

Stewardship

The streambank protection program under stewardship is an important additional means of protecting water quality. Under this program, the DNR could obtain an easement on both sides of the stream (generally 66 feet wide on each side). If needed, the DNR will financially support the fencing of the stream to protect it from livestock access. Spring Creek is a stewardship stream.

Endangered Resources

Endangered, threatened, and special concern species and natural areas are listed in Chapter Two of the plan. To the best extent possible, every effort should be made to protect these species. If specific to rational or other information is needed, contact the DNR Bureau of Endangered Resources.

Cultural Resources

Procedures for coordination with state and federal historic preservation laws are outlined in Chapter Two. The known archaeological sites within the Spring Creek watershed will need special consideration when structural best management practices are being considered. Settling basins, manure storage structures, and streambank or shoreline shaping and riprapping are likely practices that may impact archaeological sites.

Coordination with State and Federal Conservation Compliance Programs

The Spring Creek 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 Soil Conservation Service.

Coordination with Pheasants Forever and Trout Unlimited

The conservation organizations, Pheasants Forever and Trout Unlimited have agreed to cooperate with landowners in installing best management practices such as streambank protection, wetland restoration, and shoreline buffers.

Specifically, Trout Unlimited has agreed to donate \$1,000.00 toward funding streambank protection best management practices in Spring Creek.

CHAPTER EIGHT

Project Evaluation

Introduction

This chapter briefly summarizes the plan for monitoring the progress and evaluating the effectiveness of the Spring Creek Priority Watershed Project. The evaluation strategy includes these components:

- Administrative review
- Pollution reduction evaluation

Information on these components will be collected by the Rock County LCD and reported on a regular basis to the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (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 Bureau of Community Assistance.

Administrative Review

The first component, the administrative review, will focus on the progress of the County in implementing the project. The project will be evaluated with respect to accomplishments, financial expenditures, and staff time spent on project activities.

1. **Accomplishment Reporting:** The Computer Assisted Management and Planning System, called CAMPS, is a computer data management system that has been developed by the U.S. Soil Conservation Service (SCS). The SCS, the DNR and the DATCP use CAMPS to meet the accomplishment reporting requirements of all three agencies. The Rock County LCD will use CAMPS to collect data for administrative accomplishments, and will provide the information to the DNR and the DATCP for program evaluation.

The Rock County LCD will provide the following data to the DNR and the DATCP on a quarterly basis:

- Number of personal contacts made with landowners

- Completed information and education activities
- Number of farm conservation plans prepared for the project.
- Number of cost-share agreements signed
- Number of farm conservation plan and cost-share agreement status reviews completed
- Number of farms and acres of cropland checked for proper maintenance of BMPs

In addition to quarterly reports, Rock County representatives will meet with the DNR and the DATCP staff annually to review progress and plan for the subsequent year.

2. Financial Expenditures: Rock County 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
- Total project expenditures for the LCD staff
- Amount of money paid for installation of BMPs, and money encumbered in cost-share agreements

Rock County will also provide both agencies with the following financial data on an annual basis:

- Staff training expenditures
- Interest money earned and expended
- Total county LCD budget and expenditures on the project

3. Time Spent On Project Activities: Rock County will provide time summaries to both departments for the following activities on a quarterly basis:

- Project and fiscal management
- Clerical assistance
- Pre-design and conservation planning activities
- Technical assistance: practice design, installation, cost-share agreement status review and monitoring
- Educational activities
- Training activities
- Leave time

Pollutant Load Reduction

Key Nonpoint Sources for Evaluating Pollutant Load Reductions

The purpose of the second evaluation component, pollutant load reduction, is to calculate reductions in the amount of key pollutants as a result of installing BMPs. Key sources were identified for estimating changes in pollutant loads that reach surface waters, in the Spring Creek Watershed; upland sediment, and runoff from barnyards and fields spread with manure, and streambank/shoreline erosion.

As described in Chapter Three, this plan calls for the following pollutant reductions for all subwatersheds:

Pollutant load reductions are developed according to activities needed to achieve the water quality objectives. The following is a summary of reductions to be targeted for the entire watershed.

Sediment Goal: Reduce overall sediment delivered by 76 percent to meet this goal, the following is needed:

- ★ Seventy-eight percent reduction in sediment reaching streams from agricultural uplands by bringing all fields down to "T". This includes 28 percent reduction in sediment delivered will be realized if half of the existing planned practices are installed.
- ★ Seventy-five percent reduction in streambank sediment delivered to all streams and a 50 percent overall repair of streambank habitat on Spring Creek.

Phosphorus Goal: Reduce overall phosphorus load by 74 percent to meet this goal, the following is needed:

- ★ Eighty-five percent reduction in organic pollutants from barnyards in all subwatersheds.
- ★ Thirty-nine percent reduction in organic pollutants from winter-spread manure on "unsuitable" acres in all subwatersheds.

In addition, this plan calls for a restoration of 20 percent of degraded or prior converted wetlands.

Streambanks

Rock County (LCD) staff will calculate changes in streambank sediment in terms of tons of sediment and length of eroding sites. A tally will be kept of landowners contacted, the amount of streambank sediment being generated at the time of contact, and changes in erosion levels estimated after installing BMPs.

Upland Sediment Sources

Rock County will use the WIN HUSLE (Wisconsin Nonpoint Source) model to estimate sediment reductions due to changes in cropping practices. The counties will use CAMPS to provide data for the WIN HUSLE model on a quarterly basis, as described above.

Barnyard Runoff

Rock County will use the BARNY (Modified ARS) model to estimate phosphorus reductions due to the installation of barnyard control practices. The county will report the information to the DNR through CAMPS.

NOTE: In the event that CAMPS is replaced, the replacement system will be used for all project tracking.

CHAPTER NINE

Water Resource Evaluation Monitoring

Introduction

The goal of the priority watershed evaluation monitoring program is to evaluate the progress of the nonpoint source control program toward improving the quality of water resources.

Monitoring objectives are to:

1. Evaluate whether water quality "objectives" resulting from implementation of best management practices at specific sites have been attained.
2. Evaluate whether pollutant load reduction goals have been met and the effectiveness of those goals in improving water quality at specific sites.
3. Evaluate the BMP implementation process, and the effectiveness of BMPs in reducing the pollutants at specific sites.
4. Evaluate the application of priority watershed plans to the management of water resources, and the attainment of water quality standards and beneficial uses.

Program Organization

1. Evaluation monitoring activities in priority watersheds will be planned and conducted according to monitoring program guidance in the Bureau of Water Resources, Surface Water Monitoring Strategy.

Evaluation monitoring can be conducted at selected sites in basins on the 5-year basin assessment schedule. Or they, can be conducted at selected sites as special projects, depending on other monitoring priorities.

2. Evaluation monitoring may be conducted on selected waterbodies in priority watersheds that meet specific site selection criteria. These sites would be part of a statewide strategy designed to meet the program evaluation monitoring goal and objectives.
3. Evaluation monitoring need not be conducted in each priority watershed.

Site Selection Criteria

The following criteria are suggested for site selection in agricultural watersheds to be intensively evaluated as part of basin assessments, or as special projects:

Location

1. Where BMPs are planned but yet to be implemented in priority watersheds;
2. Where serious water quality, habitat or both problems exist, and a direct cause/effect relationship between problems and nonpoint sources are obvious;
3. Where a high probability exists that appropriate BMPs will be installed in the site's watershed. If possible, final monitoring site selection should come after cost-share agreements have been signed. Extra effort should be made to achieve full participation by all land owners;
4. Where sites are not meeting attainable uses and have a high potential to improve following management of nonpoint sources;
5. Where reference sites with similar characteristics, including attainable uses, are available in the same or adjacent watersheds. A reference site can be either an impacted site that will not be managed, or preferably, a site without water quality problems and meeting attainable uses. The important consideration is that reference site conditions are not expected to change except due to climatic conditions; and
6. Where sites have adequate access for sampling personnel and equipment.

Size

1. Sites should be located on permanent streams large enough to support well developed fish communities. Streams should be 5 to 30 feet wide with base flows of 1 to 20 cfs; and
2. Watersheds should be manageable with areas of 5 to 50 square miles.

Water Quality

1. Suspected or known water quality problems should be caused by manageable nonpoint sources should not be present or not significant; and
2. Point sources should not be present or not significant; and

3. Potential sources of problems that cannot or are unlikely to be managed should not be present.

Habitat

1. Habitat problems should be caused by poor land use practices immediately adjacent to or near sites, and in-stream habitat should have a high potential to improve following implementation of BMPs; and
2. Sites should not be selected that have been ditched within 10 to 15 years.

Site Selection Process

Potential evaluation monitoring sites can be located while conducting basin assessments, or conducting appraisal monitoring in newly selected priority watersheds. Selecting potential sites during the appraisal monitoring process is recommended.

Reconnaissance surveys can be conducted to locate sites that meet evaluation monitoring criteria in on-going priority watershed projects. When potential sites are located by reconnaissance, data should be obtained to determine if site selection criteria are met. And, county staffs should be contacted to determine the potential for land owner participation.

Sites selected for evaluation should meet most of the selection criteria, including the presence of appropriate reference sites.

Evaluation Monitoring Approaches

Priority watershed evaluation monitoring projects can be conducted as part of basin assessments on a 5-year schedule, or as special projects subject to Bureau approval of annual monitoring plans. Intensive evaluation monitoring will continue to be conducted at "master monitoring" sites by the Bureau of Research, United States Geological Service and Water Resources Management staff. Basin assessments, special projects and monitoring project work planning are discussed in the Bureau's Monitoring Strategy.

The following evaluation monitoring options are provided as guidance for developing monitoring plans. Any option, or a combination of options, may be used for evaluating priority watershed projects.

Basin Assessment Approach

1. Select specific sites in priority watersheds that meet site selection criteria, including at least one reference site per treatment site. Intensively monitor these sites during the basin

assessment year to establish pre-implementation surface water conditions. Evaluation monitoring projects should be designed to fit individual site characteristics, but should generally include collection of water chemistry, habitat, fish community and macroinvertebrate data.

These same sites should be monitored again in 5 years (post-implementation) when the basin is scheduled to be reassessed. These data would be compared to pre-implementation data to evaluate site specific improvements resulting from implementation of BMPs. Monitoring on a 5-year schedule would continue if appropriate.

2. Repeat appraisal type monitoring at selected sites in priority watersheds on the 5-year basin assessment schedule.

The general water resource conditions in all priority watersheds will be assessed by conducting appraisal monitoring for developing priority watershed management plans. Appraisal monitoring provides a general water resource quality and problems assessment that, when repeated during future basin assessments, can be used to evaluate surface water quality improvements, especially where they are significant.

When conducted on the 5-year basin assessment schedule, pre-implementation appraisal monitoring data may be compared to watershed wide assessment (using appraisal monitoring techniques) data, to provide a general, but adequate priority watershed project evaluation.

This approach would provide an evaluation of more surface waters in a priority watershed, and an evaluation of the overall results of a priority watershed project.

Special Project Approach

3. This approach is essentially the same as the basin assessment intensive monitoring approach (option 1), except that sites may be monitored more frequently, and would be planned as special projects. Guidance for special project planning is provided in the Bureau's Monitoring Strategy.

Spring Creek Priority Watershed

Evaluation monitoring will not be conducted during the eight year implementation phase due to recent monitoring developments. The Spring Creek watershed is currently under consideration to become a master monitoring site.

Southern District staff recommends a 5-year basin assessment approach. If time and staff are available and if it is approved in the district surface water monitoring plan, a special project monitoring approach will also be considered at selected sites which meet the site selection criteria.

Basin Assessment Approach

- **Watershed Streams**

Southern District staff will conduct or repeat appraisal type monitoring at the same sites that were monitored in 1991-92 as part of the Appraisal Monitoring Plan/Report (Marshall, 1993). Monitoring will follow the five year basin assessment schedule and will include the same types of monitoring outlined in the Spring Creek Water Resources Appraisal Report (Marshall, 1993). This monitoring approach should detect habitat and surface water quality improvements, especially where they are significant. Monitoring will occur only in subwatersheds where significant Best Management Practice Installation has occurred.

Special Projects Approach

Southern District staff proposes more intensive/frequent monitoring at selected sites. Again this is optional and its implementation is based on available staff and approval in the districts surface water monitoring plan.

The special projects approach to evaluation monitoring in Spring Creek Watershed will focus on streambank stabilization and/or habitat improvement demonstration projects. Fish shocking, habitat assessment and perhaps macroinvertebrate monitoring will be performed before and after demonstration projects including riprapping, lunger structures and streambank fencing. Special demonstration sites will be selected along short stream segments. WDNR Fisheries Research staff and USGS staff will be evaluating Spring Creek Watershed for a potential NPS Master Monitoring Site in May, 1993.

APPENDIX A

Watershed Planning Methods

This chapter describes the steps and procedures used to prepare this plan. These are:

- Evaluating water quality and aquatic habitat.
- Assessing pollution sources.
- Establishing water resource objectives.
- Establishing pollution reduction goals.
- Developing a nonpoint source control strategy.
- Involving the public and local units of government.

Evaluating Water Quality and Aquatic Habitat

The Department of Natural Resources (DNR) is responsible for: designating the biological and recreational uses that surface waters can support under proper management; prescribing the water quality required to sustain these designated uses; and indicating the methods to implement, achieve and maintain those conditions.

The DNR's Southern District Water Resources Management staff conducted investigations of the existing quality and natural resource conditions for Spring Creek in 1992. Their purpose was to evaluate water quality problems and establish a basis for setting water resources management objectives. Detailed assessment results are documented in the water resource appraisal report.

Data Collection

The following is a summary of the five elements comprising the water quality and aquatic habitat investigation.

Stream Habitat Evaluation

Information characterizing stream habitat—including flow rate and depth, substrate quality, channel configuration, stability, and water temperature—were collected using techniques that the DNR developed. The data were evaluated using DNR's Stream Classification Guidelines (Ball, 1982).

Water Quality Assessment

Surface water quality was assessed through review of historical water chemistry data and an evaluation of bottom dwelling animals (macroinvertebrates) using the Hilsenhoff Biotic Index (Hilsenhoff, 1982). Extensive bacteria (fecal coliform) surveys were conducted to assess the suitability of surface waters for recreational use. Private well samples were collected and analyzed for nitrate + nitrite and triazine herbicides. Analytical data were used to assess the quality of groundwater in the watershed.

Fisheries Resource Assessment

Fish communities were assessed qualitatively using a combination of historical data (Fago, 1984) and information collected during this investigation. Resident fish populations in the streams, lakes, and impoundments were sampled using seines and electric shocking equipment.

Navigability and Recreational Use Determinations

The extent and degree to which streams are navigable was determined based on evidence of canoeing or boating, field data including evidence of stream alteration or use, and information that landowners or other local experts provided. Recreational uses were determined through field observations, file data and information from local users.

Data Interpretation

The data described above were used to determine the existing and potential biological and recreational uses for surface waters. The existing uses reflect present biological and recreational conditions. Potential uses reflect biological and recreational conditions that could be achieved under prescribed types and levels of management. Even though existing and potential uses of a surface water are the same, management programs can result in significant changes in the quality of the aquatic environment. Use classifications and supporting water quality standards used in evaluating water resource conditions are discussed below.

Biological Stream Use Classification

Biological stream use classes describe the fish species or other aquatic organisms which a stream system supports. Designation is based on the ability of a stream to provide suitable habitat and water quality conditions for fish and other aquatic life. The following biological stream use classification system was used statewide and was applied to surface waters in the Spring Creek Watershed.

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

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

WWFF= Warm Water 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

Discussions also include the "class" of trout streams based on the publication "Wisconsin Trout Streams" [DNR Publ. 6-3600(80)] and Outstanding/Exceptional Resource Waters, Wisconsin Administrative Code NR 102.20 and NR 102.11.

Class I trout streams are high quality, and populations are sustained by natural reproduction.

Class II trout streams have some natural reproduction but may need stocking to maintain a desirable fishery.

Class III trout streams have no natural reproduction and require annual stocking of legal-size fish to provide sport fishing.
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Recreational Stream Use Classification

Recreational stream use classifications are described by a level of human body contact determined to be safe and reasonable. The system applies to all surface waters including those categorized as intermediate or marginal under the above referenced biological use classification system. Three designations are used under the recreational stream classification system. These designations are full body contact, partial body contact, and noncontact.

Full Body Contact

These waters are used for human recreation where immersion of the head is expected and occurs often. Recreation activities classified as full body contact include swimming, waterskiing, sailboarding and other similar activities.

Partial Body Contact

These waters are used for human recreation where immersion of the head is not frequent and contact is most often incidental or accidental. Recreational activities classified as partial body contact include boating, canoeing, fishing and wading.

Noncontact

These waters should not be used for human recreation. This category is used infrequently when extenuating circumstances such as high concentrations of in-place pollutants, an uncontrollable pollution source, or other conditions dictate that contact with the water would be an unnecessary health risk.

Water Quality Standards and Criteria

Surface water quality standards and criteria are expressions of the conditions considered necessary to support biological and recreational uses. Water quality standards for recreational and biological uses are contained in Chapters NR 102, NR 104, and NR 105 Wisconsin Administrative Code.

In addition to these standards, other criteria were used to assess the suitability of surface waters for recreational and biological uses. Data characterizing stream size and accessibility were used to help determine the suitability and types of recreation a stream is capable of supporting. Information on current recreational use of surface waters (provided by users at public access points and discussions with local officials) was also used to assess suitability of surface waters for recreation.

Additional information used to assess the suitability of surface waters for biological uses includes recommended maximum nutrient levels, suspended solids concentrations and the extent to which streambeds are clogged with sediment.

Groundwater quality standards for substances of public health concern and public welfare concern are contained in Chapter NR 140 Wisconsin Administrative Code. The enforcement standards (ES) and preventative action limits (PAL) are defined on page 40 in Chapter Two. If well samples results exceeded the nitrate + nitrite ES, owners were sent a notice warning them that infants under six months and pregnant women should not drink the well water. At nitrate + nitrite levels greater than 40 mg/L, owners are eligible to apply for well compensation funds from the Bureau of Water Supply.

If well sample results using the triazine screen exceeded 1 $\mu\text{g/L}$, wells were resampled and analyzed specifically for atrazine and its metabolites. This was free of charge and on voluntary basis by the Bureau of Water Supply who assisted well owners in obtaining a clean water supply.

Assessing Pollution Sources

The purpose of the pollution source assessment is to identify the rural and urban sources and quantities of pollutants impacting surface waters. Rural and urban pollutant sources assessed for this watershed are discussed below.

Rural Nonpoint Sources

Excessive quantities of sediment, nutrients, oxygen demanding substances, pesticides and bacteria are pollutants carried in runoff draining agricultural areas. These pollutants degrade surface water quality thereby restricting recreational and biological uses. The principal rural nonpoint sources evaluated in preparing this plan include:

- Barnyards and livestock area runoff.
- Eroding uplands delivering sediment to surface waters.
- Eroding, slumping, or trampled streambanks.
- Areas contributing runoff of winter-spread livestock manure.
- Gullies.

The Rock County LCD staff conducted inventories during year 1992. Inventory procedures are documented below. The DNR in cooperation with the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and the LCD staff completed the data analyses. Inventory and evaluation procedures are summarized below.

Barnyard and Livestock Area Runoff

The Rock County LCD staff mapped the locations of 5 barnyards in the watershed on 1985 1"=400' scale aerial photographs. A field survey of each barnyard was conducted to collect information needed to determine its pollution potential.

The barnyard data was used in the "BARNY" Model (Baun, 1992), a modification of the animal lot runoff model, which the U.S. Department of Agriculture, Agricultural Research Service developed (Young, 1982). Information about the mass loading of total phosphorus

annually was generated to evaluate the relative pollution potential of each barnyard. The livestock operations were ranked according to their potential to impact surface and/or groundwater quality.

Upland Erosion and Sediment Delivery

The LCD staff conducted the inventory on about 6 square miles, or 100 percent of the watershed, using existing data and field investigations. Cropland, pastures, grasslands, woodlands and other open (non-urban) land uses were investigated. Existing data sources included site specific farm conservation plans, 1987 1"=400' scale aerial photographs, and U.S. Geological Survey 1"=2,000' scale quadrangle maps. The information obtained for each parcel included size, soil type and erodibility, slope percent and length, land cover, crop rotation, present management, overland flow distance and destination, channel type and receiving water.

Upland erosion and sediment delivery was determined using the Wisconsin Nonpoint Source (WIN HUSLE) Model (Baun & Snowden, 1992). The WIN HUSLE model calculates the average annual quantity of eroded soil reaching surface waters from each farm field. The determination is made based on a "typical" year of precipitation. Estimated sediment delivery was used to assess the relative pollution potential of each farm field in the watershed.

Streambank Erosion

The LCD staff and the DNR conducted field surveys on about 3 miles of perennial and intermittent streams located in rural areas.] The method used is a modification of the streambank erosion analysis included in Phase II of the Land Inventory Monitoring process used by the U.S. Department of Agriculture, Soil Conservation Service. At locations where erosion was occurring, the following information was recorded:

- Length of trampled or eroding bank.
- Vertical height.
- Estimated annual rate of recession.
- Adjacent land uses.
- Potential management measures.

The amount of sediment lost annually was calculated for each erosion site. In addition, areas adjacent to streams impacted by livestock, but which were not necessarily eroding at a high rate, were also noted.

Runoff from Areas Winter-spread with Livestock Waste

This analysis was done to estimate the pollution potential associated with winter-spreading livestock waste in the watershed. The information collected for the barnyard and upland erosion surveys was used in this evaluation.

This analysis was completed using a three-step process. First, the number of acres that each livestock operation needed to landspread manure was calculated for a six-month period approximating when manure cannot be incorporated into the ground because of frozen or saturated conditions. The amount of manure that each operation generated was based on the number and type of livestock.

Second, the land available to each livestock operation for winter-spreading was characterized according to its environmental sensitivity. Lands having slopes equal to or greater than six percent or located within the floodplain were considered to have a high potential to deliver landspread manure to lakes and streams during periods of spring thaw.

Third, the number of sensitive acres winter-spread with manure was estimated for each livestock operation based on the number of acres needed for winter-spreading and the proportion of lands available to the livestock operation determined to be environmentally sensitive. This number was used to indicate the relative pollution potential of each livestock operation due to runoff of winter-spread manure.

Streambank Erosion

Rural streambank erosion survey techniques were applied to portions of urban streams where streambank erosion was suspected to be a problem. Sites were selected based on information from the DNR water resources staff and local municipal staff.

Other Pollution Sources

Additional sources of surface water pollution beyond those discussed in this plan are degrading water quality in the watershed. These pollution sources have the potential of overshadowing improvements in water quality that might otherwise occur as a result of the priority watershed program.

The DNR conducted an inventory and evaluation of these other pollution sources. Inventory results and recommendations for alleviating the water quality impacts of these other pollution sources are documented in Chapter Four of this plan.

Establishing Water Resource Objectives

Recreational and biological water resource objectives were established for each of the streams and lakes in the watershed. These objectives identify how the project is anticipated to change the quality of the aquatic environment for recreational and biological uses. Factors considered in establishing water resource objectives include: existing water quality and aquatic habitat; factors or pollutants that may be preventing the surface water from reaching its full potential of supporting biological and recreational uses; and the practicality of reducing pollutants.

Establishing Pollution Reduction Goals

Nonpoint pollution reduction goals are estimates of the level of nonpoint source control needed to meet the water quality and recreational use objectives identified in this plan. Pollution reduction goals and water resource objectives are established together since they are integrally related.

Developing a Nonpoint Source Management Strategy

The final step in the planning process is the development of a strategy for achieving the nonpoint source pollution reduction goals identified in the plan. Several items are addressed in developing the management strategy including:

- Critical nonpoint pollution sources.
- Effective management practices and guidelines for use of state cost-share funds for practice installation.
- Responsibilities, estimated workloads and work schedules for local implementing agencies, and guidelines for use of state funds to support local implementation activities.
- Estimated cost of installing practices and supporting staff at the local level.
- Information and education needs.
- Project evaluation needs.

Identification of critical nonpoint sources eligible for cost share and technical assistance under the Nonpoint Source Water Pollution Abatement (NPS) Program were determined by:

- Evaluating pollutant loading for each nonpoint source in each subwatershed.
- Determining the relative importance of controlling each source (barnyards, urban runoff, cropland erosion, etc.) to achieving the water resource objectives.
- Developing criteria to determine which sources need to be controlled.
- Applying the criteria to determine eligibility for participation in the priority watershed project.

This evaluation was carried out on a subwatershed and watershed basis for the rural nonpoint sources. The result is a site specific ranking of nonpoint sources and a determination of assistance to be made available through the nonpoint source program for the control of NPS pollution, financial and technical.

The DNR convened an advisory committee to assist in preparing this watershed plan.

APPENDIX B

Glossary

ACUTE TOXICITY:

Any poisonous effect produced by a single short-term exposure to a chemical that results in a rapid onset of severe symptoms.

ADVANCED WASTEWATER TREATMENT:

The highest level of wastewater treatment for municipal treatment systems. It requires removal of all but 10 parts per million of suspended solids and biological oxygen and/or 50 percent of the total nitrogen. Advanced wastewater treatment is also known as "tertiary treatment."

AGRICULTURAL CONSERVATION PROGRAM (ACP):

A federal cost-sharing program to help landowners install measures to conserve soil and water resources. ACP is administered by the USDA ASCS through county ACP committees.

ALGAE:

A group of microscopic, photosynthetic water plants. Algae give off oxygen during the day as a product of photosynthesis and consume oxygen during the night as a result of respiration. Therefore, algae effect the oxygen content of water. Nutrient-enriched water increases algae growth.

AMMONIA:

A form of nitrogen (NH_3) found in human and animal wastes. Ammonia can be toxic to aquatic life.

ANAEROBIC:

Without oxygen.

AREA OF CONCERN:

Areas of the Great Lakes identified by the International Joint Commission (IJC) as having serious water pollution problems.

AREAWIDE WATER QUALITY MANAGEMENT PLANS (208 PLANS):

A plan to document water quality conditions in a drainage basin and make recommendations to protect and improve basin water quality. Each basin in Wisconsin must have a plan prepared for it, according to section 208 of the Clean Water Act.

ANTIDegradation:

A policy stating that water quality will not be lowered below background levels unless justified by economic and social development considerations. Wisconsin's antidegradation policy is currently being revised to make it more specific and meet EPA guidelines.

AVAILABILITY:

The degree to which toxic substances or other pollutants are present in sediments or elsewhere in the ecosystem and are available to affect or be taken up by organisms. Some pollutants may be "bound up" or unavailable because they are attached to clay particles or are buried by sediment. Oxygen content, pH, temperature and other conditions in the water can affect availability.

BACTERIA:

Single-cell, microscopic organisms. Some can cause disease, but others are important in organic waste stabilization.

BASIN PLAN:

See "Areawide Water Quality Management Plan".

BENTHIC ORGANISMS (BENTHOS):

Organisms living in or on the bottom of a lake or stream.

BEST MANAGEMENT PRACTICE (BMP):

The most effective, practical measures to control nonpoint sources of pollutants that runoff from land surfaces.

BIOACCUMULATION:

The uptake and retention of substances by an organism from its surrounding medium and food. As chemicals move through the food chain, they tend to increase in concentration in organisms at the upper end of the food chain such as predator fish, or in people or birds that eat these fish.

BIOASSAY STUDY:

A test for pollutant toxicity. Tanks of fish or other organisms are exposed to varying doses of treatment plant effluent. Lethal doses of pollutants in the effluent are then determined.

BIOCHEMICAL OXYGEN DEMAND (BOD):

A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. BOD₅ is the biochemical oxygen demand measured in a five day test. The greater the degree of pollution, the higher the BOD₅.

BIODEGRADABLE:

Waste that can be broken down by bacteria into basic elements. Most organic wastes such as food remains and paper are biodegradable.

BIOTA:

All living organisms that exist in an area.

BUFFER STRIPS:

Strips of grass or other erosion-resisting vegetation between disturbed areas and a stream or lake.

BULKHEAD LINES:

Legally established lines that indicate how far into a stream or lake an adjacent property owner has the right to fill. Many of these lines were established many years ago and allow substantial filling of the bed of the river and bay. Other environmental laws may limit filling to some degree.

CARCINOGENIC:

A chemical capable of causing cancer.

CATEGORICAL LIMITS:

All point source discharges are required to provide a basic level of treatment. For municipal wastewater treatment plants this is secondary treatment (30 mg/l effluent limits for SS and BOD). For industry the level depends on the type of industry and the level of production. More stringent effluent limits are required, if necessary, to meet water quality standards.

CHLORINATION:

The application of chlorine to wastewater to disinfect it and kill bacteria and other organisms.

CHLORORGANIC COMPOUNDS (CHLORORGANICS):

A class of chemicals that contain chlorine, carbon and hydrocarbon. This generally refers to pesticides and herbicides that can be toxic. Examples include PCB's and pesticides such as DDT and dieldrin.

CHRONIC TOXICITY:

The effects of long-term exposure of organisms to concentrations of a toxic chemical that are not lethal, but is injurious or debilitating in one or more ways. An example of the effect of chronic toxicity is reduced reproductive success.

CLEAN WATER ACT:

See "Public Law 92-500."

COMBINED SEWERS:

A wastewater collection system that carries both sanitary sewage and stormwater runoff. During dry weather, combined sewers carry only wastewater to the treatment plant. During heavy rainfall, the sewer becomes swollen with stormwater. Because the treatment plant cannot process the excess flow, untreated sewage is discharged to the plant's receiving waters, i.e., combined sewer outflow.

CONFINED DISPOSAL FACILITY (CDF):

A structure built to contain and dispose of dredged material.

CONGENERS:

Chemical compounds that have the same molecular composition, but have different molecular structures and formula. For example, the congeners of PCB have chlorine located at different spots on the molecule. These differences can cause differences in the properties and toxicity of the congeners.

CONSERVATION TILLAGE:

Planting row crops while only slightly disturbing the soil. In this way a protective layer of plant residue stays on the surface. Erosion rates decrease.

CONSUMPTION ADVISORY:

A health warning issued by DNR and WDHSS that recommends people limit the fish they eat from some rivers and lakes based on the levels of toxic contaminants found in the fish.

CONTAMINANT:

Some material that has been added to water that is not normally present. This is different from a pollutant, which suggests there is too much of the material present.

CONVENTIONAL POLLUTANT:

Refers to suspended solids, fecal coliforms, biochemical oxygen demand, and pH, as opposed to toxic pollutants

COST-EFFECTIVE:

A level of treatment or management with the greatest incremental benefit for the money spent.

CRITERIA:

See water quality standard criteria.

DDT:

A chlorinated hydrocarbon insecticide that was banned because of its persistence in the environment.

DIOXIN (2,3,7,8-tetrachlorodibenso-p-dioxin):

A chlorinated organic chemical which is highly toxic.

DISINFECTION:

A chemical or physical process that kills organism that cause disease. Chlorine is often used to disinfect wastewater.

DISSOLVED OXYGEN (DO):

Oxygen dissolved in water. Low levels of dissolved oxygen cause bad smelling water and threaten fish survival. Low levels of dissolved oxygen often result from inadequate wastewater treatment. The DNR considers 5 ppm DO necessary for fish and aquatic life.

DREDGING:

Removal of sediment from the bottom of water bodies.

ECOSYSTEM:

The interacting system of biological community and its nonliving surrounding.

EFFLUENT:

Solid, liquid or gas wastes (byproducts) that are disposed on land, in water or in air. As used in the RAP, effluent generally means wastewater discharges.

EFFLUENT LIMITS:

The DNR issues WPDES permits establishing the maximum amount of pollutant to be discharged to a receiving stream. Limits depend on the pollutant and the water quality standards that apply for the receiving waters.

EMISSION:

A direct (smokestack particles) or indirect (busy shopping center parking lot) release of any contaminant into the air.

ENVIRONMENTAL PROTECTION AGENCY (USEPA):

The federal agency responsible for enforcing federal environmental regulations. The Environmental Protection Agency delegates some of its responsibilities for water, air and solid waste pollution control to state agencies.

ENVIRONMENTAL REPAIR FUND:

A fund established by the Wisconsin Legislature to deal with abandoned landfills.

EPIDEMIOLOGY:

The study of diseases as they affect populations rather than individuals, including the distribution and incidence of a disease mortality and morbidity rates, and the relationship of climate, age, sex, race and other factors. EPA uses such data to establish national air quality standards.

EROSION:

The wearing away of the land surface by wind or water.

EUTROPHIC:

Refers to a nutrient-rich lake. Large amounts of algae and weeds characterize a eutrophic lake (see also "Oligotrophic" and "Mesotrophic").

EUTROPHICATION:

The process of nutrient enrichment of a lake leading to increased production of aquatic organisms. Eutrophication can be accelerated by human activity such as agriculture and improper waste disposal.

FACILITY PLAN:

A preliminary planning and engineering document that identifies alternative solutions to a community's wastewater treatment problems.

FECAL COLIFORM:

A group of bacteria used to indicate the presence of other bacteria that cause disease. The number of coliform is particularly important when water is used for drinking and swimming.

FISHABLE AND SWIMMABLE:

Refers to the water quality goal set for the nation's surface waters by Congress in the Clean Water Act. All waters were to meet this goal by 1984.

FLOURANTHENE:

A polyaromatic hydrocarbon (PHA) with toxic properties.

FLY ASH:

Particulates emitted from coal burning and other combustion, such as wood burning, and vented into the air from stacks, or more likely, collected by electrostatic precipitators.

FOOD CHAIN:

A sequence of organisms where each uses the next as a food source.

FURANS (2,3,7,8-tetra-chloro-dibenzpofurans):

A chlorinated organic compound which is highly toxic.

GREEN STRIPS:

See buffer strip.

GROUNDWATER:

Undergroundwater-bearing areas generally within the boundaries of a watershed, which fill internal passageways of porous geologic formations (aquifers) with water that flows in response to gravity and pressure. Often used as the source of water for communities and industries.

HABITAT:

The place or type of site where a plant or animal naturally lives and grows.

HEAVY METALS:

Metals present in municipal and industrial wastes that pose long-term environmental hazards if not properly disposed. Heavy metals can contaminate ground and surface waters, fish and other food stuffs. The metals of most concern are: arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium and zinc (see also separate listings of these metals for their health effects).

HERBICIDE:

A type of pesticide that is specifically designed to kill plants and can also be toxic to other organisms.

HYDROCARBONS:

Any chemical of a large family of chemicals containing carbon and hydrogen in various combinations.

INCINERATOR:

A furnace designed to burn wastes.

INFLUENT:

Influent for an industry would be the river water that the plant intakes for use in its processing. Influent to a municipal treatment plant is untreated wastewater.

IN-PLACE POLLUTION:

As used in the RAP, refers to pollution from contaminated sediments. These sediments are polluted from past discharges from municipal and industrial sources.

INTERNATIONAL JOINT COMMISSION (IJC):

An agency formed by the United States and Canada to guide management of the Great Lakes and resolve border issues.

ISOROPYLBIPHENYL:

A chemical compound used as a substitute for PCB.

LANDFILL:

A conventional sanitary landfill is "a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading solid wastes in thin layers, materials at the end of each operating day". Hazardous wastes frequently require various types of pretreatment before they are disposed of, i.e., neutralization chemical fixation encapsulation. Neutralizing and disposing of wastes should be considered a last resort. Repurifying and reusing waste materials or recycling them for another use may be less costly.

LC-1:

The concentration that results in 1% mortality of the test animal populations exposed to the contaminant.

LC₅₀:

Lethal concentration for 50% of the test population exposed to a toxicant substance.

LD₅₀:

Lethal dose for 50 percent of the test population exposed to a toxicant substance.

LEACHATE:

The contaminated liquid which seeps from a pile or cell of solid materials and which contains water, dissolved and decomposing solids. Leachate may enter the groundwater and contaminate drinking water supplies.

LOAD:

The total amount of materials or pollutants reaching a given local.

MACROPHYTE:

A rooted aquatic plant.

MASS:

The amount of material a substance contains causing it to have weight in a gravitational field.

MASS BALANCE:

A study that examines all parts of the ecosystem to determine the amount of toxic or other pollutant present, its sources, and the processes by which the chemical moves through the ecosystem.

MESOTROPHIC:

Refers to a moderately fertile nutrient level of a lake between the oligotrophic and eutrophic levels. (See also "Eutrophic" and "Oligotrophic.")

MILLIGRAMS PER LITER (mg/l):

A measure of the concentration of substance in water. For most pollution measurement this is the equivalent of "parts per million".

MITIGATION:

The effort to lessen the damages caused, by modifying a project, providing alternatives, compensating for losses or replacing lost values.

MIXING ZONE:

The portion of a stream or lake where effluent is allowed to mix with the receiving water. The size of the area depends on the volume and flow of the discharge and receiving water. For streams the mixing zone it is one-third of the lowest flow that occurs once every 10 years for a seven day period.

NONPOINT SOURCE POLLUTION (NSP):

Pollution whose sources cannot be traced to a single point such as a municipal or industrial wastewater treatment plant discharge pipe. Nonpoint sources include eroding farmland and construction sites, urban streets, and barnyards. Pollutants from these sources reach water bodies in runoff, which can best be controlled by proper land management.

NPS:

See nonpoint source pollution.

OLIGOTROPHIC:

Refers to an unproductive and nutrient-poor lake. Such lakes typically have very clear water. (See also "Eutrophic" and "Mesotrophic.")

OUTFALL:

The mouth of a sewer, drain, or pipe where effluent from a wastewater treatment plant is discharged.

PATHOGEN:

Any infective agent capable of producing disease. It may be a virus, bacterium, protozoan, etc.

PELAGIC:

Referring to open water portion of a lake.

PESTICIDE:

Any chemical agent used to control specific organisms, such as insecticides, herbicides, fungicides, etc.

PH:

A measure of acidity or alkalinity, measured on a scale of 0 to 14 with 7 being neutral and 0 being most acid, and 14 being most alkaline.

PHENOLS:

Organic compounds that are byproducts of petroleum refining, textile, dye, and resin manufacture. High concentrations can cause taste and odor problems in fish. Higher concentration can be toxic to fish and aquatic life.

PHOSPHORUS:

A nutrient that, when reaching lakes in excess amounts, can lead to overfertilized conditions and algae blooms.

PLANKTON:

Tiny plants and animals that live in water.

POINT SOURCES:

Sources of pollution that have discrete discharges, usually from a pipe or outfall.

POLLUTION:

The presence of materials or energy whose nature, location, or quantity produces undesired environmental effects.

POLYCHLORINATED BIPHENYLS(PCBs):

A group of 209 compounds, PCBs have been manufactured since 1929 for such common uses as electrical insulation and heating/cooling equipment, because they resist wear and chemical breakdown. Although banned in 1979 because of their toxicity, they have been detected on air, land and water. Recent surveys found PCBs in every section of the country, even those remote from PCB manufacturers.

POLYCHLORINATED ORGANIC COMPOUNDS:

A group of toxic chemicals which contain several chlorine atoms.

PRETREATMENT:

A partial wastewater treatment required from some industries. Pretreatment removes some types of industrial pollutants before the wastewater is discharged to a municipal wastewater treatment plant.

PRIORITY POLLUTANT:

A list of toxic chemicals identified by the federal government because of their potential impact in the environment and human health. Major dischargers are required to monitor all or some of these chemicals when their WPDES permits are reissued.

PRIORITY WATERSHED:

A drainage area about 100,000 acres in size selected to receive Wisconsin Fund money to help pay the cost of controlling nonpoint source pollution. Because money is limited, only watersheds where problems are critical, control is practical, and cooperation is likely are selected for funding.

PRODUCTIVITY:

A measure of the amount of living matter which is supported by an environment over a specific period of time. Often described in terms of algae production for a lake.

PUBLIC LAW 92-500 (CLEAN WATER ACT):

The federal law that sets national policy for improving and protecting the quality of the nation's waters. The law set a timetable for the cleanup of the nation's waters and stated that they are to be fishable and swimmable. This also required all dischargers of pollutants to obtain a permit and meet the conditions of the permit. To accomplish this pollution cleanup, billions of dollars have been made available to help communities pay the cost of building sewage treatment facilities. Amendments in the Clean Water Act were made in 1977 by passage of Public Law 95-217, and in 1987.

PUBLIC PARTICIPATION:

The active involvement of interested and affected citizens in governmental decision-making.

PUBLICLY OWNED TREATMENT WORKS (POTW):

A wastewater treatment plant owned by a city, village or other unit of government.

RAP:

See Remedial Action Plan.

RECYCLING:

The process that transforms waste materials into new products.

REMEDIAL ACTION PLAN:

A plan designed to restore beneficial uses to a Great Lakes Area of Concern.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS):

An investigation of problems and assessment of management options conducted as part of a superfund project.

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA):

This federal law amends the Solid Waste Disposal Act of 1965 and expands on the Resource Recovery Act of 1970 to provide a program that regulates hazardous wastes, to eliminate open dumping and to promote solid waste management programs.

RETRO-FIT:

The placement of an urban structural practice in an existing urban area, which may involve rerouting existing storm sewers and/or relocating existing buildings or other structures.

RIPARIAN:

Belonging or relating to the bank of a lake, river or stream.

RIPRAP:

Broken rock, cobbles, or boulders placed on the bank of a stream to protect it against erosion.

RULE:

Refers to Wisconsin administrative rules. See Wisconsin Administrative Code.

RUNOFF:

Water from rain, snowmelt, or irrigation that flows over the ground surface and returns to streams. Runoff can collect pollutants from air or land and carry them to receiving waters.

SECONDARY IMPACTS:

The indirect effects that an action can have on the health of the ecosystem or the economy.

SECONDARY TREATMENT:

Two-stage wastewater treatment that allows the coarse particles to settle out, as in primary treatment, followed by biological breakdowns of the remaining impurities. Secondary treatment commonly removes 90% of the impurities. Sometimes "secondary treatment" refers simply to the biological part of the treatment process.

SEDIMENT:

Soil particles suspended in and carried by water as a result of erosion.

SEICHES:

Changes in water levels due to the tipping of water in an elongated lake basin whereby water is raised in one end of the basin and lowered in the other.

SEPTIC SYSTEM:

Sewage treatment and disposal for homes not connected to sewer lines. Usually the system includes a tank and drain field. Solids settle to the bottom of the tank. Liquid percolates through the drain field.

SLUDGE:

A byproduct of wastewater treatment; waste solids suspended in water.

SOLID WASTE:

Unwanted or discharged material with insufficient liquid to be free flowing.

STANDARDS:

See water quality standards.

STORM SEWERS:

A system of sewers that collect and transport rain and snow runoff. In areas that have separated sewers, such stormwater is not mixed with sanitary sewage.

SUPERFUND:

A federal program that provides for cleanup of major hazardous landfills and land disposal areas.

SUSPENDED SOLIDS (SS):

Small particles of solid pollutants suspended in water.

SYNERGISM:

The total effect is greater than the sum of the individual effects. For example, the characteristic property of a mixture of toxicants that exhibits a greater-than-additive cumulative toxic effect.

TACs:

Technical advisory committees that assisted in the development of the Remedial Action Plan.

TERTIARY TREATMENT:

See advanced wastewater treatment.

TOP-DOWN MANAGEMENT:

A management theory that uses biomanipulation, specifically the stocking of predator species of fish to improve water quality.

TOTAL MAXIMUM DAILY LOADS:

The maximum amount of a pollutant that can be discharged into a stream without causing a violation of water quality standards.

TOXIC:

An adjective that describes a substance which is poisonous, or can kill or injure a person or plants and animals upon direct contact or long-term exposure. (Also, see toxic substance.)

TOXIC SUBSTANCE:

A chemical or mixture of chemicals which, through sufficient exposure, or ingestion, inhalation or assimilation by an organism, either directly from the environment or indirectly by ingestion through the food chain, will, on the basis of available information cause death, disease, behavioral or immunologic abnormalities, cancer, genetic mutations, or development of physiological malfunctions, including malfunctions in reproduction or physical deformations, in organisms or their offspring.

TOXICANT:

See toxic substance.

TOXicity:

The degree of danger posed by a toxic substance to animal or plant life. Also see acute toxicity, chronic toxicity and additivity.

TOXicity REDUCTION EVALUATION:

A requirement for a discharger that the causes of toxicity in an effluent be determined and measures taken to eliminate the toxicity. The measures may be treatment, product substitution, chemical use reduction or other actions that will achieve the desired result.

TREATMENT PLANT:

See wastewater treatment plant.

TROPHIC STATUS:

The level of growth or productivity of a lake as measured by phosphorus content, algae abundance, and depth of light penetration.

TURBIDITY:

Lack of water clarity. Turbidity is usually closely related to the amount of suspended solids in water.

UNIVERSITY OF WISCONSIN-EXTENSION (UWEX):

A special outreach, education branch of the state university system.

VARIANCE:

Government permission for a delay or exception in the application of a given law, ordinance or regulation. Also, see water quality standard variance.

VOLATILE:

Any substance that evaporates at a low temperature.

WASTELOAD ALLOCATION:

Division of the amount of waste a stream can assimilate among the various dischargers to the stream. This limits the amount (in pounds) of chemical or biological constituent discharged from a wastewater treatment plant to a water body.

WASTEWATER:

Water that has become contaminated as a byproduct of some human activity. Wastewater includes sewage, washwater and the water-borne wastes of industrial processes.

WASTE:

Unwanted materials left over from manufacturing processes, refuse from places of human habitation or animal habitation.

WASTEWATER TREATMENT PLANT:

A facility for purifying wastewater. Modern wastewater treatment plants are capable of removing 95 % of organic pollutants.

WATER QUALITY AGREEMENT:

The Great Lakes Water Quality agreement was initially signed by Canada and the United States in 1972 and was subsequently revised in 1978 and 1987. It provides guidance for the management of water quality, specifically phosphorus and toxics, in the Great Lakes.

WATER QUALITY LIMITED SEGMENT:

A section of river where water quality standards will not be met if only categorical effluent standards are met.

WATER QUALITY CRITERIA:

A measure of the physical, chemical or biological characteristics of a water body necessary to protect and maintain different water uses (fish and aquatic life, swimming, etc.).

WATER QUALITY STANDARDS:

The legal basis and determination of the use of a water body and the water quality criteria, physical, chemical, or biological characteristics of a water body, that must be met to make it suitable for the specified use.

WATER QUALITY STANDARD VARIANCE:

When natural conditions of a water body preclude meeting all conditions necessary to maintain full fish and aquatic life and swimming, a variance may be granted.

WATERSHED:

The land area that drains into a lake or river.

WETLANDS:

Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a variety of vegetative or aquatic life. Wetland vegetation requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas.

WISCONSIN ADMINISTRATIVE CODE:

The set of rules written and used by state agencies to implement state statutes. Administrative codes are subject to public hearing and have the force of law.

WISCONSIN FUND:

A state program that helps pay the cost of reducing water pollution. Funding for the program comes from general revenues and bonds and is based on a percentage of the state's taxable property value. The Wisconsin Fund includes these programs:

Point Source Water Pollution Abatement Grant Program - Provides grants for 60% of the cost of constructing wastewater treatment facilities. Most of this program's money goes for treatment plant construction, but three percent of this fund is available for repair or replacement of private, on-site sewer systems.

Nonpoint Source Water Pollution Abatement Grant Program - Funds to share the cost of reducing water pollution. Nonspecified sources are available in selected priority watersheds.

Solid Waste Grant Program - Communities planning for solid waste disposal sites are eligible for grant money. \$500,000 will be available each year to help with planning costs.

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT GRANT PROGRAM:

A state cost-share program established by the State Legislature in 1978 to help pay the costs of controlling nonpoint source pollution. Also known as the nonpoint source element of the Wisconsin Fund or the Priority Watershed Program.

WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES):

A permit system to monitor and control the point source dischargers of wastewater in Wisconsin. Dischargers are required to have a discharge permit and meet the conditions it specifies.

**PRIORITY WATERSHED PROJECTS IN WISCONSIN
1992**

<u>Map Number</u>	<u>Large-scale Priority Watershed Project</u>	<u>County(ies)</u>	<u>Year Project Selected</u>
79-1	Galena River*	Grant, Lafayette	1979
79-2	Elk Creek*	Trempealeau	1979
79-3	Hay River*	Barron, Dunn	1979
79-4	Lower Manitowoc River*	Manitowoc, Brown	1979
79-5	Root River*	Racine, Milwaukee, Waukesha	1979
80-1	Onion River*	Sheboygan, Ozaukee	1980
80-2	Sixmile-Pheasant Branch Creek*	Dane	1980
80-3	Big Green Lake*	Green Lake, Fond du Lac	1980
80-4	Upper Willow River*	Polk, St. Crox	1980
81-1	Upper West Branch Pecatonica River*	Iowa, Lafayette	1981
81-2	Lower Black River	La Crosse, Trempealeau	1981
82-1	Kewaunee River*	Kewaunee, Brown	1982
82-2	Turtle Creek	Walworth, Rock	1982
83-1	Oconomowoc River	Waukesha, Washington, Jefferson	1983
83-2	Little River	Oconto, Marinette	1983
83-3	Crossman Creek/Little Baraboo River	Sauk, Juneau, Richland	1983
83-4	Lower Eau Claire River	Eau Claire	1983
84-1	Beaver Creek	Trempealeau, Jackson	1984
84-2	Upper Big Eau Pleine River	Marathon, Taylor, Clark	1984
84-3	Sevenmile-Silver Creeks	Manitowoc, Sheboygan	1984
84-4	Upper Door Peninsula	Door	1984
84-5	East & West Branch Milwaukee River	Fond du Lac, Washington, Sheboygan, Dodge, Ozaukee	1984
84-6	North Branch Milwaukee River	Sheboygan, Washington, Ozaukee, Fond du Lac	1984
84-7	Milwaukee River South	Ozaukee, Milwaukee	1984
84-8	Cedar Creek	Washington, Ozaukee	1984
84-9	Menomonee River	Milwaukee, Waukesha, Ozaukee, Washington	1984
85-1	Black Earth Creek	Dane	1985
85-2	Sheboygan River	Sheboygan, Fond du Lac, Manitowoc, Calumet	1985
85-3	Waumandee Creek	Buffalo	1985
86-1	East River	Brown, Calumet	1986
86-2	Yahara River - Lake Monona	Dane	1986
86-3	Lower Grant River	Grant	1986
89-1	Yellow River	Barron	1989
89-2	Lake Winnebago East	Calumet, Fond du Lac	1989
89-3	Upper Fox River (Ill.)	Waukesha	1989
89-4	Narrows Creek - Baraboo River	Sauk	1989
89-5	Middle Trempealeau River	Trempealeau, Buffalo	1989
89-6	Middle Kickapoo River	Vernon, Monroe, Richland	1989
89-7	Lower East Branch Pecatonica River	Green, Lafayette	1989
90-1	Arrowhead River & Daggets Creek	Winnebago, Outagamie, Waupaca	1990
90-2	Kinnickinnic River	Milwaukee	1990
90-3	Beaverdam River	Dodge, Columbia, Green Lake	1990
90-4	Lower Big Eau Pleine River	Marathon	1990
90-5	Upper Yellow River	Wood, Marathon, Clark	1990
90-6	Duncan Creek	Chippewa, Eau Claire	1990
91-1	Upper Trempealeau River	Jackson, Trempealeau	1991
91-2	Neenah Creek	Adams, Marquette, Columbia	1991
92-1	Balsam Branch	Polk	1992
92-2	Red River - Little Sturgeon Bay	Door, Brown, Kewaunee	1992
<u>Map Number</u>	<u>Small-scale Priority Watershed Project</u>	<u>County(ies)</u>	<u>Year Project Selected</u>
SS-1	Bass Lake*	Marinette	1985
SS-90-1	Dunlap Creek	Dane	1990
SS-90-2	Lowes Creek	Eau Claire	1990
SS-90-3	Port Edwards - Groundwater Prototype	Wood	1990
SS-91-1	Whittlesey Creek	Bayfield	1991
SS-91-2	Spring Creek	Rock	1991
<u>Map Number</u>	<u>Priority Lake Project</u>	<u>County(ies)</u>	<u>Year Project Selected</u>
PL-90-1	Minocqua Lake	Oneida	1990
PL-90-2	Lake Tomah	Monroe	1990
PL-91-1	Little Muskego, Big Muskego and Wind Lakes	Waukesha, Racine, Milwaukee	1991
PL-92-1	Lake Noquebay	Marinette	1992
PL-92-2	Lake Ripley	Jefferson	1992

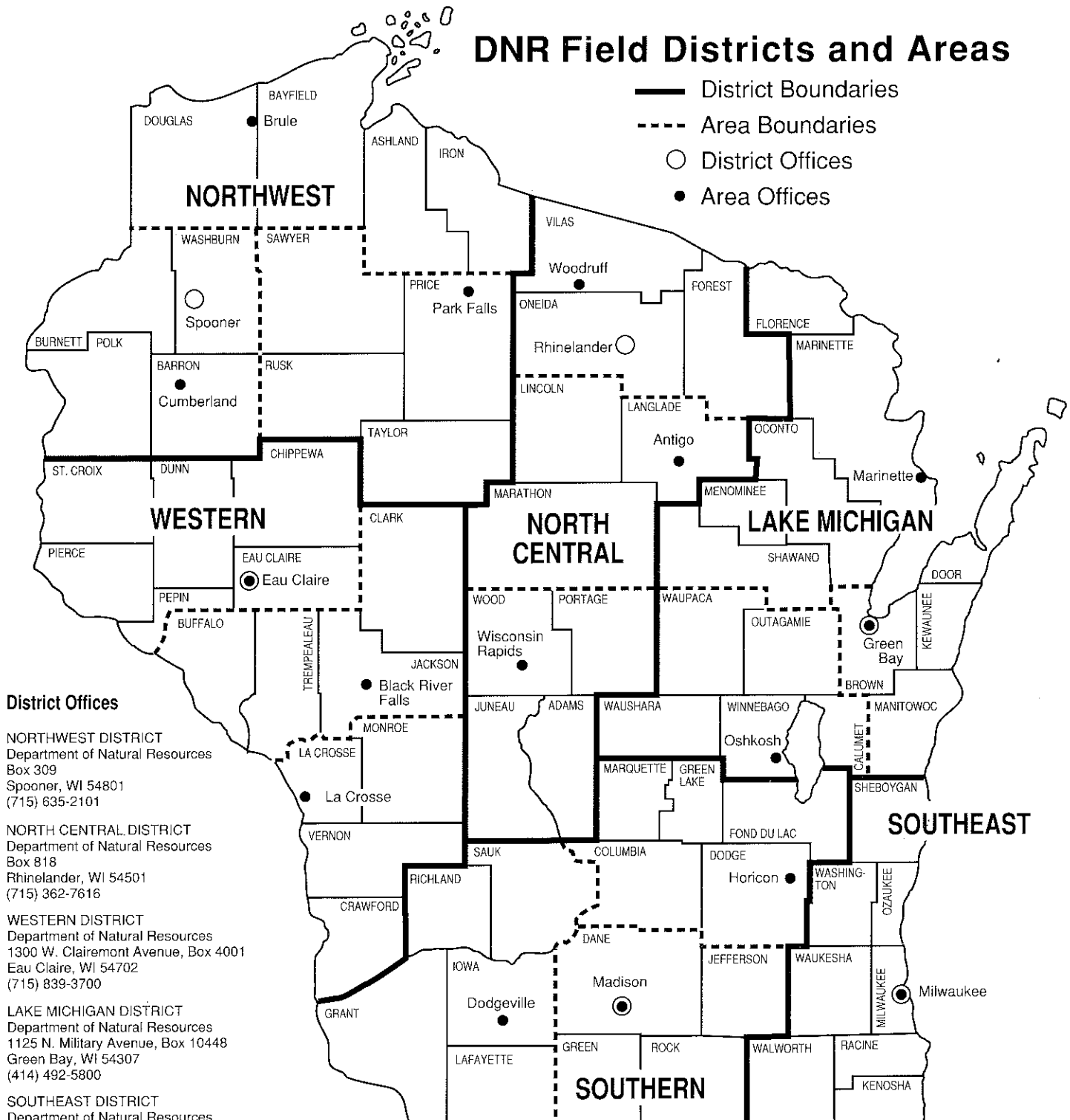
* Project completed

1992



DNR Field Districts and Areas

- District Boundaries
- - - Area Boundaries
- District Offices
- Area Offices



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) 362-7616

WESTERN DISTRICT
 Department of Natural Resources
 1300 W. Clairemont Avenue, 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

DNR, Richards Street Annex
 4041 N. Richards Street
 Box 12436
 Milwaukee, WI 53212
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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.

