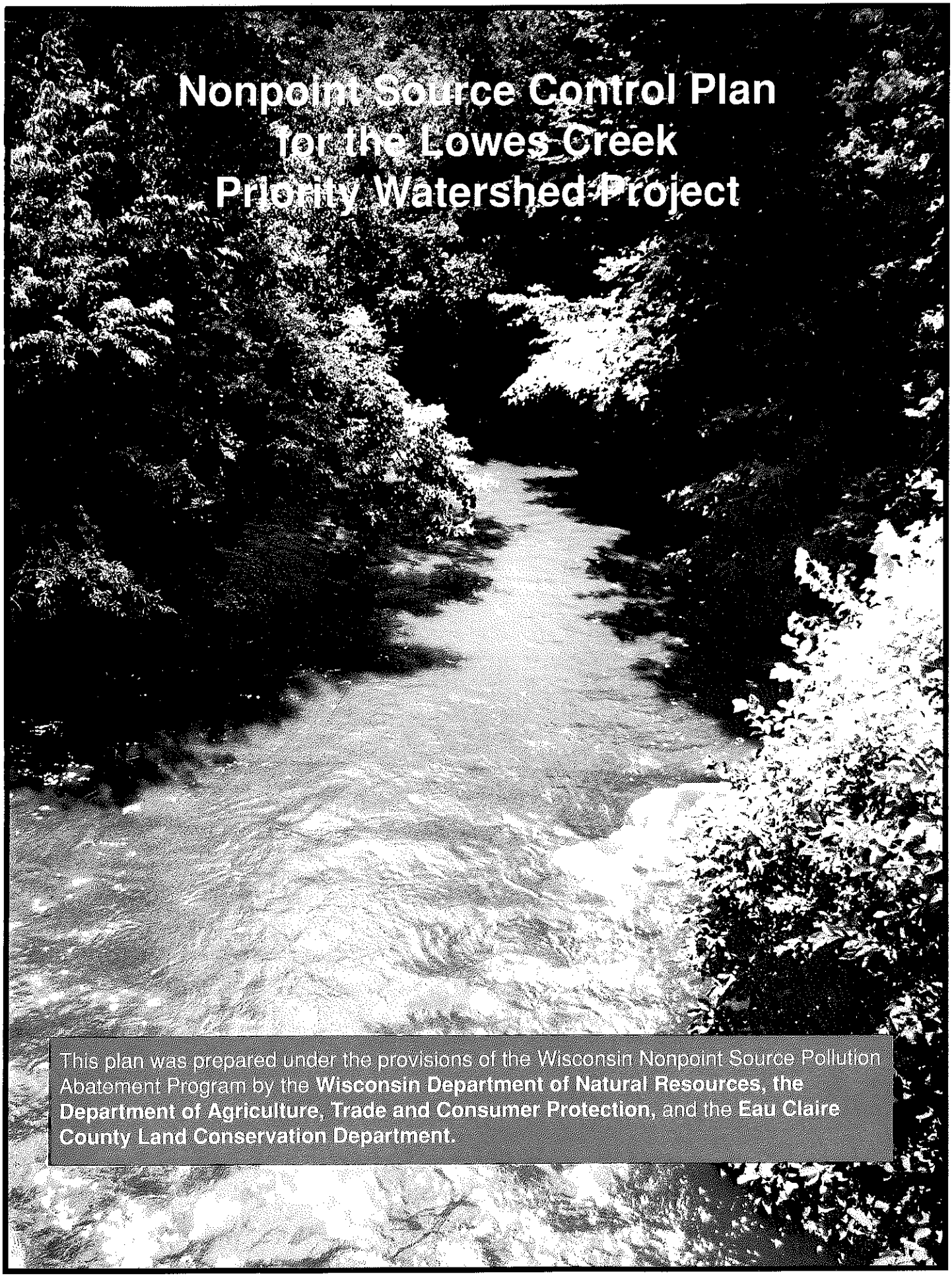

Nonpoint Source Control Plan for the Lowes Creek Priority Watershed Project

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

Watershed Plan Organization Information

Natural Resources Board
1994

Herbert F. Behnke, Chairman
Trygve A. Solberg, Vice Chairman
Neal W. Schneider, Secretary
Betty Jo Nelson
Mary Jane Nelson
James E. Tiefenthaler, Jr.
Stephen D. Willett

Eau Claire County Land Conservation Committee

William Bean, Chairman
Paul Beckfield
David Brakke
Ronald Erickson
Ronald Fischer
Harold Graff
James Nichols
John Speros

Wisconsin Department of Natural Resources

George E. Meyer, Secretary
Susan L. Sylvester, Administrator, Division for Environmental Quality
Bruce Baker, Director, Bureau of Water Resources Management
Rebecca Wallace, Chief, Nonpoint Source & Land Management Section

Wisconsin Department of Agriculture, Trade and Consumer Protection

Alan Tracy, Secretary
Nicholas Neher, Administrator, Division of Agriculture Resource Management
Dave Jelinski, Director, Bureau of Land and Water Resources
Keith Foye, Chief, Soil and Water Section

Nonpoint Source Control Plan for the Lowes Creek Priority Watershed Project

The Wisconsin Nonpoint Source Water Pollution Abatement Program

May, 1993

This Plan Was Cooperatively Prepared By:

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

Publication WR-377-94

For copies of this document please contact:

Department of Natural Resources
Bureau of Water Resources Management
Nonpoint Source and Land Management Section
P.O. Box 7921
Madison, WI 53707

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.

Watershed Plan Credits

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Additional Contributors

In addition to the people listed on the inside front cover, the author and principal contributors would like to acknowledge the contributions of the following people:

Cindy Hoffland, DNR Bureau of Community Assistance
Laura Chern, DNR Groundwater Management Section

Lowes Creek Citizens Advisory Committee

Resolutions and Letters of Approval

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
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October 24, 1994

FILE REF: 2600

Mr. Clifford W. Chatterson, Chair
County Board of Supervisors
Courthouse
712 Oxford Avenue
Eau Claire, WI 54703

Dear Mr. Chatterson:

It is my pleasure to approve A Nonpoint Source Control Plan for the Lowes Creek Priority Watershed. 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 the Wisconsin Land and Water Conservation Board. I am also approving this plan as an amendment to the Lower Chippewa Areawide Water Quality Management Plan. 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.

This plan, prepared jointly by staff from the Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection, and the Eau Claire County Land Conservation Department, is an example of the cooperative efforts that can help improve and protect the water resources of the Lowes 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
Dan Simonson - Western District
Jean Schomisch - Eau Claire County Land Conservation Department
Craig Karr - DNR Bureau of Community Assistance

State of Wisconsin
Department of Agriculture, Trade and Consumer Protection

Alan T. Tracy, Secretary

801 West Badger Road • PO Box 8911
Madison, WI 53708-8911

August 31, 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 A Nonpoint Source Control Plan for the Lowes Creek Priority Watershed. Jeff Prey, of your staff, and the Eau Claire County Land Conservation Division have agreed to make changes to the draft plan as a result of our comments. Our comments include:

1) Changes to Table 5.3a - Total estimated rural BMP costs
   a) Add cost per unit column
   b) Note this estimate is at 75% participation
   c) Add footnote stating that although no estimate of upland acres needing treatment is indicated, some upland erosion control practices may be needed in the future.
   d) Add footnote explaining the county's additional 10% cost share and the state's match for certain practices. An additional column may be added to help explain this.

2) Add the following paragraph to the Total Project Cost section on page V21.

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.

We look forward to assisting the Department of Natural Resources and the Land Conservation Committee and staff of Eau Claire County in implementing the project. Please contact Lynne Hess (273-6206) 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: [redacted]
Jean Schomisch, Eau Claire County Land Conservation Division

RESOLUTION

ENROLLED NO. R137-72 FILE # 93-94/110

- APPROVING THE LOWES CREEK PRIORITY WATERSHED PLAN -

WHEREAS, the Eau Claire County Board of Supervisors accepted the Lowes Creek Priority Watershed Project in 1990; (File No. 90-91/244); and

WHEREAS, The Wisconsin Department of Natural Resources has prepared a Plan that details the watershed characteristics, and management strategies to control nonpoint source pollution affecting Lowes Creek; and

WHEREAS, the project provides an additional 10% State funding, provided the County funds 10%; and

WHEREAS, the County recognizes the environmental, economic, and health benefits of participating in this project.

NOW THEREFORE, BE IT RESOLVED that the Eau Claire County Board of Supervisors approves the Nonpoint Source Control Plan for the Lowes Creek Priority Watershed.

BE IT FURTHER RESOLVED, that the County approves 10%, up to a maximum of $70,000 for the local share of the nonpoint source grant.

Adopted: July 20, 1993

Joanne Lester,
County Clerk

STATE OF WISCONSIN)
) ss.
COUNTY OF EAU CLAIRE)

I, Joanne Lester, County Clerk of Eau Claire County, Eau Claire, Wisconsin, do hereby certify that the attached is a true and correct copy of Resolution #93-94/110, adopted at the July 20, 1993 session of the County Board of Supervisors at the County Courthouse in the City of Eau Claire.

Joanne Lester

Joanne Lester
County Clerk

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CHAPTER ONE
Introduction, Purpose, Legal Status, and Plan Organization

Introduction

A portion of the Lowes Creek watershed was selected in October 1990 as a small-scale priority watershed project through the Wisconsin Nonpoint Source Water Pollution Abatement Program. The purpose of the priority watershed program is to achieve and maintain the water quality of streams, wetlands and groundwater in the watershed in an efficient and effective manner. The Lowes Creek project is a small-scale priority watershed project, and only a portion of the Lowes Creek watershed is within the project area (see Map 1-1).

The project area, as shown in Map 1-1, was selected because of the water quality problems in surface streams and groundwater. The land use in the project area is comprised of urban development, low density rural residential development, agricultural lands, and some commercial development. Lowes Creek receives considerable urban stormwater runoff from a 72-inch storm sewer draining an approximate 1200 acre commercial and residential area on the southwest side of Eau Claire.

Legal Status of the Nonpoint Source Water Pollution Abatement Program

The Wisconsin Nonpoint Source Water Pollution Abatement Program was created in 1978 by the Wisconsin Legislature and Governor. They recognized the need to address the extensive water quality threats and problems in Wisconsin's lakes, streams, and groundwater that are not caused by point sources. The program is administered by the DNR (DNR) with assistance from the DATCP (DATCP). Section 144.25 of the Wisconsin Statutes authorizes the program, and Chapter NR 120 of the Wisconsin Administrative Code governs its operation.

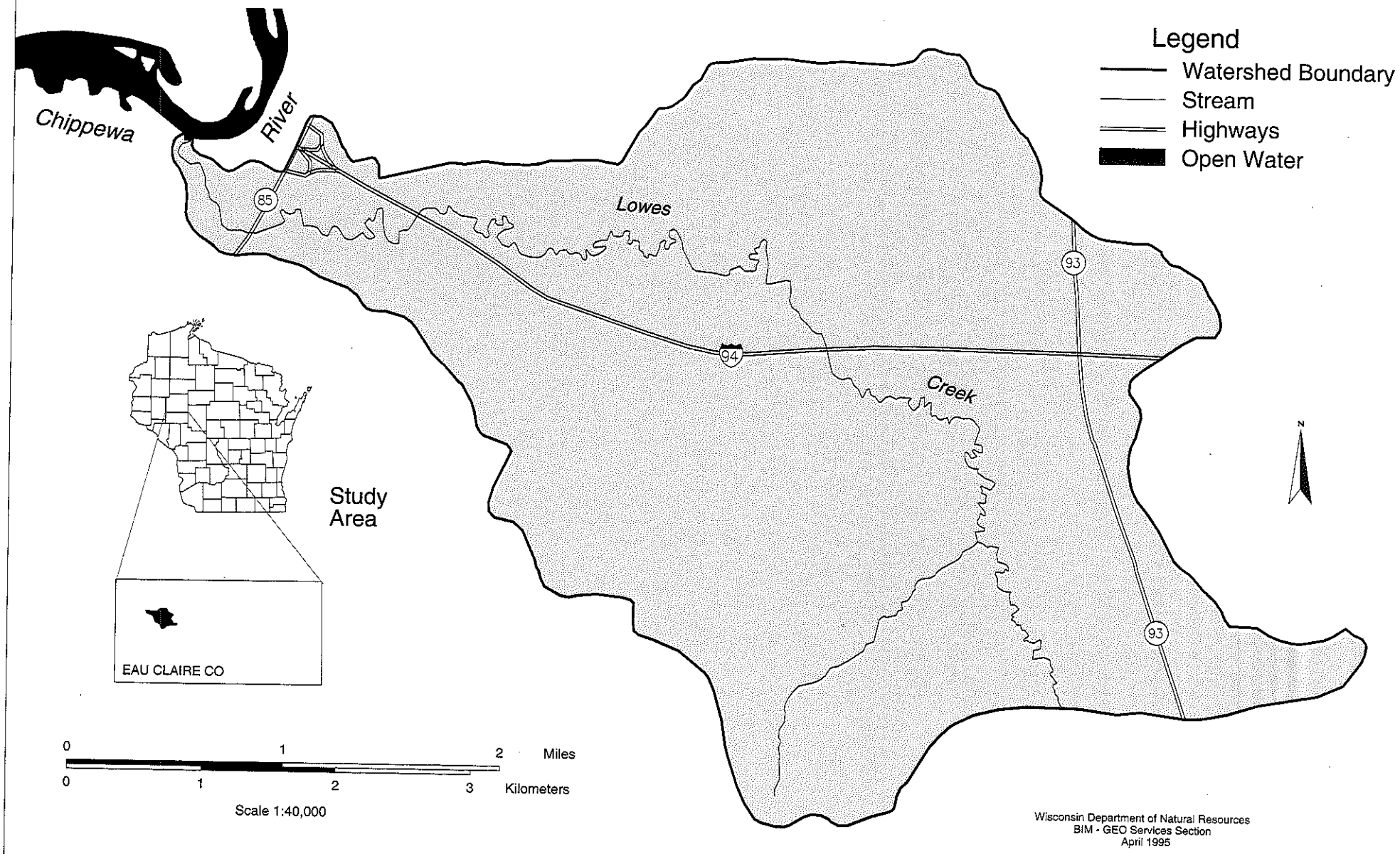
The Lowes Creek Project Area Plan was prepared under the authority of the Wisconsin Nonpoint Source Water Pollution Abatement Program described in Section 144.25 of the Wisconsin Statutes and Chapter NR 120 of the Wisconsin Administrative Code. It was

prepared under the cooperative efforts of DNR, DATCP, the Eau Claire County Land Conservation Department, local units of government, and the Lowes Creek Priority Watershed Citizens Advisory Committee.

The nonpoint source program operates on a project basis. State funds are available to cost-share the installation of urban and rural nonpoint source controls termed "best management practices" on critical sites within the project area. Cost-share rates range from 50 to 70 percent. State funds are also available to hire additional local staff to implement the priority watershed project. Participation by landowners is voluntary.

Each project is divided into two phases. In the first phase, the project development phase, a priority watershed plan is developed jointly by DNR, DATCP, and local units of government for the project area. Generally, the county Land Conservation Department represents the county government.

Map 1- 1.
General Map of the Lowes Creek Priority Watershed



The purpose of this plan is to guide the second phase of the project, the implementation phase, towards achieving the water quality needs. The project development phase lasts up to 18 months. Program funds are provided to local units of government to hire staff to participate in developing the plan. Assistance is also provided by the University of Wisconsin-Extension and the Soil Conservation Service.

The implementation phase is normally eight years. During the first three years, landowners may sign cost-share agreements with local units of government. These agreements must contain all of the best management practices needed to control the nonpoint sources identified as critical in the project area plan. Landowners have up to five years after signing a cost-share agreement to install all of the best management practices on the cost-share agreement. Municipalities are also eligible to enter into agreements. Similar to the plan development phase, program funds are available to local units of government to support staff needed to assist landowners and conduct other implementation activities. All best management practices must be maintained for ten years starting with the installation of the last practice on the cost-share agreement. Presently there are over 50 priority watershed projects statewide.

Purpose

The program for abating nonpoint sources is based on establishing projects in priority areas. There are several steps involved in developing a project from start to finish, and they involve different state agencies, local governments, citizen groups, and landowners.

A. The Plan - A priority watershed project is guided by a plan prepared cooperatively by the DNR, DATCP, and local units of government, with input from a local citizens advisory committee. Project staff evaluate the conditions of surface water and groundwater, and inventory the types of land use and nonpoint sources of pollution throughout the project area. The priority watershed project area plan assesses nonpoint and other sources of water pollution and identifies best management practices needed to control pollutants to meet specific water resource objectives. The plan guides implementation of these practices in an effort to improve water quality.

Upon approval by state and local authorities, the plan is implemented by local units of government. Water quality improvement is achieved through voluntary implementation of nonpoint source controls (Best Management Practices) and the 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.

B. Implementation - Technical assistance is provided to aid in the design of best management practices. State level cost-share assistance is available to help offset the cost of installing these practices. Eligible landowners and local units of government are contacted by the county Land Conservation Departments to determine their interest in voluntarily installing the best management practices identified in the plan. Cost-

share agreements are signed, listing the practices, costs, cost-share amounts, and a schedule for installation of management practices.

Implementation of the watershed plan is assisted by an information and education component. Specific activities are undertaken according to the plan that will allow the agencies and local governments to conduct the project in a successful manner. 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 in the watershed.

Plan Organization

The remainder of this plan is divided into three parts: The Project Area Assessment, A Detailed Program for Implementation, and Project Evaluation. The contents of each part are described below:

Part 1 - The Project Area Assessment

This part includes Chapters 2, 3, and 4 and contains identification of the water quality problems, water quality objectives, pollutant load reductions, nonpoint sources, and the project management area.

Chapter 2

"General Project Area Characteristics" is an overview of the cultural and natural resource features important to planning and implementation efforts for the priority watershed project area.

Chapter 3

"Water Quality Conditions, Objectives, and Nonpoint Sources" presents field inventory results and identifies the water quality or water resource problems and improvements that can be obtained through implementation of a nonpoint source control project. The chapter discusses the level of pollutant control needed to achieve the water resource objectives and describes the nonpoint sources and other sources of pollution.

Chapter 4

"Management Actions" identifies the level of urban and rural nonpoint source pollution control needed to meet the water quality objectives. Eligibility criteria for funding to control nonpoint sources under the priority watershed project are also presented.

Part 2 - Detailed Program for Implementation

Chapters 5 and 6 are contained in this part and explain the administrative structure and procedures for conducting the project.

Chapter 5

"Local Government Implementation Program" describes the manner by which the local units of government administer the project. Budgets for time and money are detailed in this chapter, along with a description of the information and education program.

Chapter 6

"Integrated Resource Management Program" presents the strategy for involving DNR resource management programs (fisheries management, wildlife, and forestry) in the nonpoint source pollution abatement efforts in the Lowes Creek Project Area.

Part 3 - Project Evaluation

Chapters 7 and 8 include the plan for evaluating the project for administrative and water quality achievements.

Chapter 7

"Progress Assessments" discusses the means for assessing the amount of nonpoint source control gained through installation of best management practices in the project area.

Chapter 8

"Evaluation Monitoring" presents a strategy and schedule for monitoring to determine the water quality impacts of implementing nonpoint source controls in the Lowes Creek Project Area.

CHAPTER TWO
General Project Area Characteristics

Location

The Lowes Creek Priority Watershed Project is a small-scale watershed project of approximately 9.7 square miles, located in Eau Claire County in western Wisconsin. The project area encompasses approximately one third of the length of Lowes Creek, at the northern downstream end and includes approximately one sixth of the Lowes Creek watershed. The watershed is part of the Lower Chippewa River basin, which drains all or parts of Buffalo, Pepin, Dunn, Eau Claire, Chippewa, Barron and Taylor counties. Water draining from the Lowes Creek watershed enters the Chippewa River just below the Interstate Highway 94 bridge.

Cultural Features

Civil Divisions and Population

The northern portion of the project area falls within the corporate boundary of the city of Eau Claire. The remainder is located in the Town of Washington, with a small portion in the Town of Brunswick. (Table 2-1).

Population is predicted to grow steadily in civil divisions encompassing the project area, as shown in Table 2-2. Much of this growth can be attributed to rural residential development, and to growth and development on the south side of the city of Eau Claire.

Table 2-1. Watershed Project Areas by Civil Divisions

City/Township	Sq. Miles	Acres	% of Watershed
City of Eau Claire	1.77	1,135.9	18.3%
Town of Washington	7.56	4,838.1	78.0%
Town of Brunswick	0.36	230.5	3.7%
Total	9.69	6,203.5	100.0%

Table 2-2. Area Watershed Civil Divisions and Population Estimates

City/Township	1990	2000	2010	2020
City of Eau Claire	56,856	60,505	65,845	71,184
Town of Washington	6,226	6,888	7,498	8,106
Town of Brunswick	1,506	1,653	1,799	1,945

Source: West Central Wisconsin Regional Planning Commission
Note: Populations are for entire civil divisions - not just portions within the project area.

Land Use Characteristics

Topography within the Lowes Creek project area is relatively flat in the urban areas in the north. Narrow, steep sloping wooded ridges and valleys are found in the west and central portions of the area, and rolling hills are typical of the southern portion of the area.

The trend in Eau Claire County is toward a decrease in the number of farms, while the number of small hobby farms is increasing. An increasing amount of land is being used for non-farm homes. Many suburban homes, on lots of 1 to 5 acres have been built on land in the vicinity of Lowes Creek. The amount of land developed for residential or commercial use is projected to increase greatly in the coming decades (Table 2-3, Map 2-1 and 2-2).

Table 2-3. Land Development Projections for the Lowes Creek Watershed

Land Use	1990 (Acres)	2010 (Acres)	Change (Acres)
Park Land	368	441	73
Open Space	4,129	702	-3,427
Residential - Medium Density	1,197	4,023	2,826
Trailer Parks	37	37	0
Manufacturing	98	41	-57
Multiple Family Housing	80	152	72
Schools, Institutions	105	104	-1
Freeways, Interchanges	154	176	22
Commercial strips	35	567	532

Source: West Central Regional Planning Commission

Approximately 1,230 acres of land within the project area remains farmland. Of this, 43% is in the Conservation Reserve Program or is pasture or idle land (Table 2-4). The remaining 700 acres are farmed by 11 landowners. Most of this land is found in the southern part of the project area.

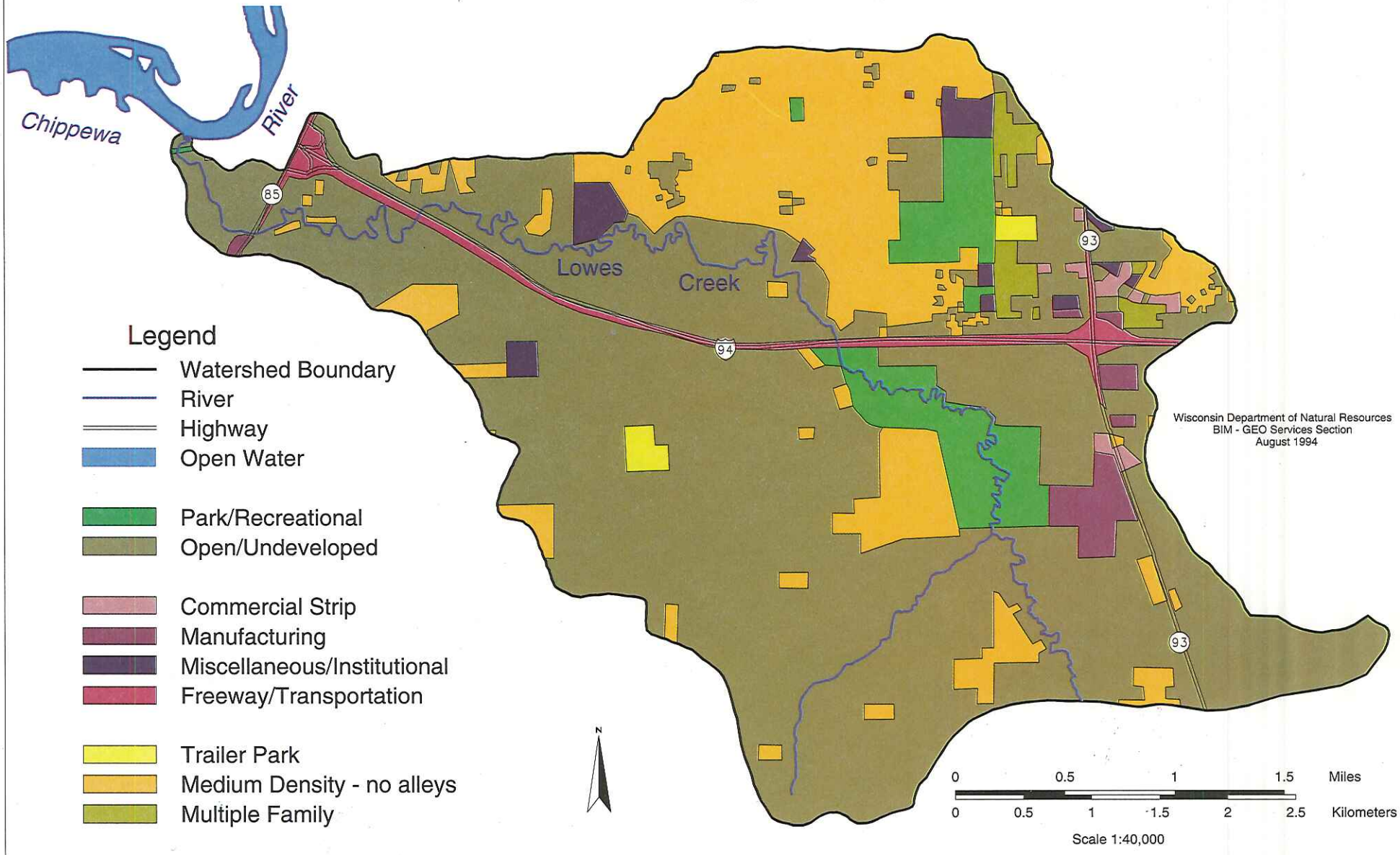
Table 2-4. Agricultural Land Uses in the Lowes Creek Project Area

Land Use	Acreage	Percent
Cropland	702	57%
Conservation Reserve	204	17%
Pasture or Idle	324	26%
TOTAL	1,230	100%

Source: Eau Claire County Land Conservation Division

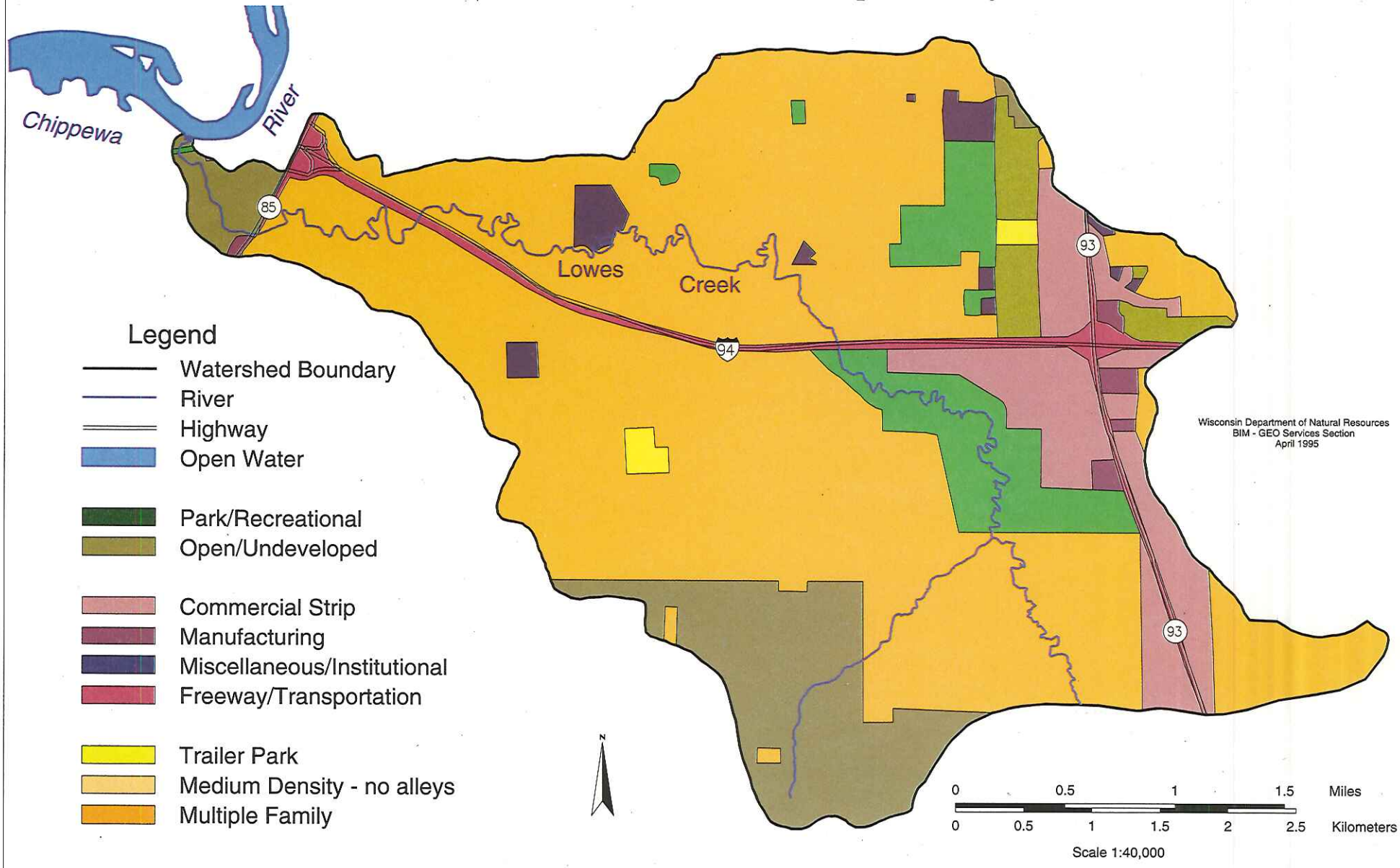
Map 2- 1.
Existing Land Use for the Lowes Creek Priority Watershed

data is from 1990 and provided by the WCWRPC



Map 2- 2.
Proposed Land Use for the Lowes Creek Priority Watershed

land use is proposed for the year 2010 and provided by the WCWRPC



Water Sources

Residents of the project area obtain water exclusively from groundwater supplies either through privately owned wells or municipal wells. Well water samples were tested from 25 private wells in 1990 through a county groundwater project. All parameters tested met drinking water standards. Well test results are summarized in Table 2-5.

City of Eau Claire residents within the project area receive water from municipal wells, which are located outside the Lowes Creek project area.

Potential sources of groundwater contamination include pesticide usage, lawn and garden care, buried fuel tanks, and a waste reclamation facility within the project area.

Table 2-5. Summary of Private Well Water Test Results, 1990

Average values for 25 wells tested. None exceeded drinking water standards.

	Hardness	Nitrates	Chloride	pH	Conduct.	Alk.
	(ppm)	(ppm)	(ppm)		(umohs/cm)	(ppm)
Average:	71	1.5	6.9	7.5	171.4	58
Highest:	162	6.4	28	8.06	288	118
Lowest:	<4	<0.2	<1	6.85	81	13

Physical Characteristics and Geography

Climate

The climate of Eau Claire County is typically continental with warm summers and cold winters. The area is in the zone of frequent midlatitude storms. Spring and fall are commonly short and are generally periods of sharp temperature transitions. Annual precipitation averages 30.2 inches. Nearly two-thirds of the annual precipitation falls in the 5 months of the growing season from May through September. Thunderstorms are common in the summer months of June, July and August, but the amount of rain may be erratic and variable. Yearly snowfall ranges from less than 12 inches to more than 75 inches. The growing season, defined as the number of days between the last spring freeze and the first fall freeze, averages 151 days.

Soils

A soil association is a landscape that has a distinctive pattern of soils in defined proportions, and typically consists of one or more major soils and at least one minor soil. Two soil associations dominate the Lowes Creek project area.

Elkmound-Eleva Association - This association is found throughout the project area, in upland areas. Well drained and somewhat excessively well drained loams and sandy loams are underlain by loamy and sandy material and sandstone. This association consists of gently sloping to very steep ridges and valleys, with well defined stream and drainageway patterns. Controlling erosion and maintaining tilth and fertility are the main concerns in managing these soils for cultivation. Many of these lands may be close to bedrock, and sloping to steep; they may have moderate to severe limitations for homesites, septic tank absorption fields and roads.

Menahga-Plainfield Association - This association consists of broad, nearly level and gently sloping glacial outwash plains and stream terraces. Most nearly level areas have long slopes, and more steeply sloping areas have short slopes. Excessively drained sands and loamy sands are underlain by loamy sand and sand. This association makes up abut one-third of the county, and occurs along streams within the project area. Controlling erosion and soil blowing and maintaining organic matter content and fertility are the main concerns in managing these soils for cultivation. Irrigation is usually required for crops. Most of this association is wooded, and used for recreation and rural residences.

Water Resources

Streams

Lowes Creek is the only perennial stream within the project boundary and is a coldwater Class II brown trout stream. The trout fishery is primarily limited by warm water temperatures and scarcity of suitable spawning substrate and cover. Twelve miles of lower reaches of Lowes Creek fall within the project area. The lower end of the stream corridor runs through a valley with steep slope which has kept development to a minimum. The stream is wooded with tag alder, maple and ash. The area is subject to substantial flooding during snowmelt. The upper reaches of Lowes Creek within the project area have much less steep topography, and in recent years have seen rapid residential development. Continued development pressure can be expected in the future. The substrate is shifting sand with some finer sediments settling out. There is a good number of riffles and pools. The riffles lack the gravel needed for spawning and also the habitat for macroinvertebrates. The pools are three to five feet deep and instream cover consists of down trees. Slumping and erosion of the banks has occurred in many areas, even where there is little evidence of human activity. This can be attributed to the sandy soil types, steepness of the banks and seasonal flooding.

Stream baseflow measured on November 20, 1991, ranged from 60.74 to 71.25 cubic feet per second. It increased abut 17% from the I-94 bridge to the STH 37 bridge, approximately 3 miles downstream. Stream gradient increases from 10 ft/mile above I-94, to 20 ft/mile downstream of I-94 (Table 2-6)

Table 2-6. Stream Flow on Lowes Creek

LOCATION	DATE	CUBIC FT./SECOND
Interstate I-94	11/20/91	60.74
S. Lowes Creek Road	11/20/91	62.82
STH 37	11/20/91	71.25

Lakes

There are no lakes within the project area.

Wetlands

There are six identified wetlands within the Lowes Creek project area.

Carlson Swamp T26N, R9W, s. 16, nw 1/4 of nw 1/4. This is a timber swamp and a lowland forest type wetland. The north end is a marsh meadow. This wetland has the potential for absorbing runoff from adjacent agricultural lands.

London Road Marsh T26N, R9W, s. 3, se 1/4 of nw 1/4. This is a small shallow water marsh, surrounded by urban development. It is succumbing to plant succession, and only a small area of open water exists. It provides nesting habitat for waterfowl and songbirds. This wetland is threatened by sedimentation from uncontrolled erosion from the Oakwood Hills area.

Meadow Brook Marsh T26N, R9W, s4, sw 1/4 of nw 1/4.

Olson Marsh T26N, R9W, s. 11, sw 1/4 of sw 1/4. This is a shallow freshwater marsh that lies in a drainageway at the base of moderate to steep slopes. Because of some excavation and diking, surface water is present for short periods of time each year. Water leaving the marsh enters Peterson Marsh, then empties to Lowes Creek.

Peterson Marsh T26N, R9W, s. 10, ne 1/4 of se 1/4. This deep freshwater marsh lies in a depression surrounded by agricultural, residential and commercial land. The marsh has standing water for 3 to 6 months during the year, and is a favorable area for wetland wildlife. Due to development, drainage, pasturing and plant succession, wetland qualities are diminishing.

Sletner Marsh T26N, R9W.

Groundwater Resources

The crystalline rock that forms the bedrock floor of Eau Claire County generally does not yield water to wells, but it does control the dip of the sedimentary rock formations that lie on top of it and thus indirectly influences groundwater levels. Cambrian sandstone overlies the crystalline rock and is the principal bedrock aquifer. Glacial deposits which overlie the bedrock are also aquifers, but water availability from these deposits differs greatly within a small area. The best glacial drift aquifers are thick sand and gravel outwash deposits. These are the principal source of ground water discharge to streams in Eau Claire County. The aquifers are recharged by rainfall that averages about 30 inches per year. Seasonal and long term climatic variations cause fluctuations in both streamflow and ground water levels.

As mentioned earlier in this chapter, 25 private drinking water wells were tested in 1990 within the project area. All parameters tested met drinking water standards (see Table 2-5).

Endangered and Threatened Resources

Information on endangered resources was obtained from the Bureau of Endangered Resources of the DNR. Endangered resources include rare species and natural communities.

It should be noted that comprehensive endangered resource surveys have not been completed for the entire Lowes 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. Updates or revisions of this watershed plan should be reviewed by the Bureau of Endangered Resources to include new records.

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 DNR to be in jeopardy on the basis of scientific evidence.

Wisconsin Threatened Species

Any species which appears likely, within the foreseeable future, on the basis of scientific evidence to become endangered.

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.

Wisconsin Endangered Species

Prenanthes aspera, rough white lettuce

Wisconsin Threatened Species

(Our files do not contain records of any Wisconsin Threatened Species in this watershed.)

Wisconsin Special Concern Species

(Our files do not contain records of any Wisconsin Special Concerns species in this watershed.)

Natural Areas

Natural areas are sites that contain high quality examples of natural communities. State Natural Areas (SNAs) have been officially designated by the DNR Natural Areas Program as deserving protection. They are owned by the DNR, other state and local agencies, or conservation organizations, and are managed to protect the natural resources. There are no State Natural Areas or natural areas in the project area.

CHAPTER THREE
Water Quality Conditions, Objectives and Nonpoint Sources

Introduction

This chapter will include an explanation of the water resource problems documented in the project area. The impact of nonpoint source pollutants on the stream is also presented. The water resource appraisal conducted in 1991 described the existing water resource conditions, the potential for improvement, the existing nonpoint problems, and the water resource objectives. Pollutant load reductions for each category of nonpoint source pollution were established and are more fully described in Chapter 4. Nonpoint source types are described in Chapter 3.

Water Quality Basics

The headwaters area of Lowes Creek drains rolling agricultural and wooded lands and the downstream portion drains urban land in the City of Eau Claire. The stream receives considerable urban stormwater runoff from a 72-inch storm sewer draining an approximate 1200 acre commercial and residential area on the southwest side of Eau Claire.

Lowes Creek is the only perennial stream within the project area and is a coldwater Class II brown trout stream. The trout fishery is primarily limited by warm water temperatures and scarcity of suitable spawning substrate and cover.

Water resource problems in the project area include streambank erosion, sedimentation of riffle and pool areas, periodic flooding and elevated stream temperatures. Sediment from streambank and upland erosion causes filling-in of pools and spawning substrate in riffle areas. Sedimentation of spawning substrate in riffle areas (measured as embeddedness) inhibits reproductive success of some fish species by reducing inter-gravel flow which is necessary to maintain suitable temperature and oxygen conditions for eggs and larval fish. Sedimentation of riffle areas also destroys habitat for macroinvertebrates and other fish food organisms. Filling-in of pools reduces the amount of available cover for juvenile and adult fish.

Lowes Creek frequently has summer water temperatures above optimal conditions for a coldwater trout fishery. The elevated water temperatures may be the result of a number of factors including lack of stream shading and stream morphology in the upstream area. The

upstream portion is generally shallower, less shaded and has a lower gradient than the lower portion. The stream also receives warm water discharges from the City of Eau Claire storm sewer during summer runoff events.

The types of nonpoint source pollutants that have been documented in the project area include the following:

Sediment - Sources of sediment to Lowes Creek have been identified as stream bank erosion and gully erosion. Little upland erosion appears to occur. Further discussion of these sediment sources is presented later in this chapter.

Organic Loading - The sources identified for this pollutant include one barnyard with potentially large discharges of animal waste. Further discussion of this source is presented later in this chapter.

Water Temperature - During summer of 1991, water temperatures frequently exceeded optimal conditions for brown trout. Stream temperatures were higher above the storm sewer outfall than below.

Bacteria and Nitrates - Water chemistry monitoring results indicate the City of Eau Claire storm sewer has a measurable impact on Lowes Creek during runoff events. Several conventional pollutants including turbidity, suspended solids, ammonia-nitrogen and fecal coliform bacteria increased significantly in Lowes Creek below the outfall.

Pesticides - Pesticide loading does not appear to be a serious problem in the project area. The only pesticide detect occurred during a rain event, when low levels of Atrazine were found in the storm sewer discharge and Lowes Creek below the outfall. Additional pesticide sampling conducted as part of a statewide survey found a single Atrazine detect during a rain event in Lowes Creek below the outfall. Pesticide runoff from lawn care products in the urban drainage area does not appear to be a problem in Lowes Creek in the project area.

Water Quality Impacts of Nonpoint Sources - Nonpoint pollutants in the project area are causing water resource problems. The consequences of sedimentation, elevated stream temperatures and filling in of pools and riffle areas have been discussed in the Water Quality Basics section.

Implementation of Best Management Practices (BMPs) in the project area would have a number of positive effects on Lowes Creek. Stabilizing streambanks would increase available cover for adult fish and reduce sedimentation of riffles and pools. The effect of increased cover and overall habitat improvement would be an increase in carryover and survival of adult fish. Reduced sedimentation of riffle areas would increase fish reproduction, provided other factors such as oxygen and temperature conditions are suitable. Reduced sedimentation of riffle areas would improve habitat for macroinvertebrates and other fish food organisms. Control of sedimentation and bank erosion would also result in a narrower and deeper stream channel, providing cooler temperatures and improved cover for adult fish. Increased infiltration of urban stormwater runoff would reduce peak runoff rates, reduce downstream bank erosion and minimize impacts from warm water discharges.

Water Resource Assessment

Following is a discussion of surface water appraisal monitoring results for the project area. The description provides a summary of available information on the Lowes Creek including a description of water resource conditions and problems affecting the resource, loading reduction goals and water resource management objectives. Loading reduction goals are indicated as high, medium or low depending on the severity of impairment. Actual numerical values for these control levels will be identified during the planning process.

Fishery

Lowes Creek supports a Class II brown trout fishery that receives considerable fishing pressure due to its close proximity to an urban area. The stream supports low numbers of trout with several large fish present and limited natural reproduction. Lowes Creek is annually stocked with adult brown trout.

The trout fishery is primarily limited by warm water temperatures, scarcity of suitable cover for adult trout and lack of suitable spawning substrate. Elevated stream temperatures may be due to limited springflow, a wide and shallow stream morphometry and inadequate stream shading in the upstream portion. The substrate upstream of South Lowes Creek Road is dominated by shifting sand, which fills in pools and riffle areas and reduces trout habitat. Cover for adult trout is primarily provided by fallen trees and overhanging vegetation in the upstream portion.

Habitat

The overall Habitat Suitability Index for all life stages at three sites in Lowes Creek was below average for brown trout, primarily due to a lack of pools, embeddedness of the substrate and elevated water temperatures. Habitat for adult and juvenile brown trout was most suitable at the West Lowes Creek Road and I-94 sites. Habitat for early life stages of brown trout (embryo and fry) was poor at all sites.

Macroinvertebrates

Macroinvertebrate populations in Lowes Creek are generally dominated by pollution intolerant mayfly, stonefly and caddisfly nymphs. Streamflow, gradient, and substrate particle size increases moving downstream. Consequently, habitat for macroinvertebrates also improves moving downstream.

Stream baseflow increases about 17% from the I-94 bridge to the STH 37 bridge, approximately 3 miles downstream. Stream gradient increases from 10 feet/mile above I-94, to 20 feet/mile downstream of I-94. The amount of stream shading also increases significantly below the I-94 bridge.

The storm sewer discharge does not appear to have an adverse impact on macroinvertebrate populations. Based on macroinvertebrate sampling results and limited D.O. monitoring, dissolved oxygen and temperature conditions are within tolerable limits for trout and intolerant macroinvertebrate species below the outfall.

Stream Temperature

Water temperatures in Lowes Creek during summer 1991 frequently exceeded optimal conditions for brown trout, but did not exceed the upper limiting temperature of 27.2° C. Table 3-1 shows that mean, maximum and average daily maximum stream temperatures were higher above the storm sewer outfall than below. Cooler temperatures in the stream below the outfall are likely due to increased stream shading, aeration and springflow in the downstream reach.

Table 3-1. Water Temperatures in Lowes Creek from July 3 - September 18, 1991.

Site	Maximum	Mean	Ave. Daily Max.
Above Storm Sewer	21.8	16.6	18.2
Below Storm Sewer	21.7	16.3	17.9
30-minute interval continuous recording TempMentor results Stream Temperature (°C.)			

Although the storm sewer discharge has minimal impacts on the overall temperature regime in Lowes Creek, the discharge causes temporary temperature increases downstream of the outfall during runoff events. A comparison of stream temperatures during summer rainfall events shows the storm sewer discharge increased downstream water temperatures by one to several degrees Centigrade (C.).

Although stream temperatures below the storm sewer outfall increased during runoff events, they usually remained within the optimal range for brown trout. More frequent or greater volume stormwater discharges would increase stream temperatures and adversely impact trout, especially during summer low-flow conditions.

Water Quality

Water chemistry monitoring results indicate the City of Eau Claire storm sewer has a measurable impact on Lowes Creek during runoff events (Table 3-2). Several conventional pollutants including turbidity, suspended solids, ammonia-nitrogen and fecal coliform bacteria increased significantly in Lowes Creek below the outfall.

Table 3-2. Mean Values for Selected Water Quality Parameters from Rainfall Event Monitoring on Lowes Creek

Site No.*	Turbidity (mg/L)	Suspended Solids (mg/L)	Fecal Coliform (col./100mL)	Total Phosphorus (mg/L)	NH3-N (mg/L)
1	7.8	20	682	0.45	0.062
2	54.5	263	4,307	0.55	0.075
3	10.3	36	1,395	0.45	0.120
Net change:	+32%	+80%	+104%	0%	+93%

* Site locations:
#1 - Lowes Creek ~50 ft. upstream of storm sewer outfall
#2 - Storm sewer discharge to Lowes Creek
#3 - South Lowes Creek Road (~0.25 mi. below storm sewer outfall)

Acute and chronic toxicity standards for several metals were exceeded in the stormwater discharge and Lowes Creek below the outfall during one monitored runoff event. End-of-pipe acute toxicity water quality standards for copper and zinc were exceeded in the storm sewer discharge during the May 16 event. The end-of-pipe toxicity standards apply to point source discharges prior to reaching waters of the state. In-stream acute and chronic toxicity standards for copper were exceeded in Lowes Creek below the outfall during the May 16 event. The Wisconsin surface water toxicity standards are relatively conservative and intended to protect the most sensitive freshwater species with some margin of safety. The copper LC50 (lethal concentration for 50% of test organisms) for brook and rainbow trout is considerably higher than concentrations found in Lowes Creek. A copper LC50 is not available for brown trout, but is likely comparable to other salmonids (Schmidt, 1992).

Pesticides

The only pesticide detect occurred during a June 21 event, when low levels of Atrazine were found in the storm sewer discharge and Lowes Creek below the outfall. Additional pesticide sampling conducted as part of a statewide survey found a single Atrazine detect during an August 5 event in Lowes Creek below the outfall. It appears that pesticide runoff from lawn care products in the urban drainage area is not likely a problem in Lowes Creek.

Sediment

Sediment tubes were used to provide a relative measure of suspended sediment loads in Lowes Creek. Sediment accumulation rates in tubes below the storm sewer are slightly

higher than above the outfall. The mean sediment accumulation rate above the outfall was 0.18 cm/day compared to 0.25 cm/day below the outfall.

Considerable coarse sediment (mostly sand) entered the stream during spring and summer 1991 as a result of erosion of the storm sewer outfall structure. Substantial sediment deltas were evident in Lowes Creek at the base of the structures following several runoff events. The source of the sediment deltas appeared to be bank erosion and undercutting of the outfall structure.

Nonpoint Source Inventory Results

Rural Land Use Inventory

The county land use inventory evaluated sediment loading from upland, stream bank and gully sources located in the rural portion of the project.

Upland Erosion - The upland sediment delivery in the project area appears to be primarily from rural residential development instead of cropland. A large portion of cropland in the project area is protected by being in the Conservation Reserve Program. Much land is in pasture or fallow condition that is well protected from soil erosion. Most farmers with actively cultivated land utilize conservation practices such as contour strips, rotations and conservation tillage, and maintain soil losses at tolerable levels. Because of the proximity to the City of Eau Claire and the intensive pressure of urban sprawl in this area, construction site erosion is viewed as the predominant sediment source affecting Lowes Creek. It is highly likely that in the future agricultural acreage will decline while rural residential land use will increase.

Stream Bank Erosion - A total of 1050.1 tons per year of sediment were estimated to be lost from the 101 stream bank sites inventoried. A total of 11,310 feet of eroded stream bank occur along Lowes Creek.

Gully Erosion - Gully erosion was inventoried at 40 sites. An estimated 222 tons per year of sediment are delivered to Lowes Creek from gully sources.

Organic Pollutants

Five barnyards were inventoried in the project area and animal lot runoff was assessed by onsite visual inspection. One of the five barnyards appear to have potentially large discharges of animal waste, and are likely to need best management practices applied. Organic pollution from animal waste spreading was not inventoried.

Urban Land Use Inventory

The West Central Regional Planning Commission and the DNR inventoried pollutant sources in the urban areas and in other areas that are planned for development. The inventory was

accomplished by assigning specific land use categories and estimating the amount of acreage for each category. Previous studies have indicated that the various land uses in urban environments have pollutant loads that are predictable. For example urban land uses like industrial or commercial will contribute pollutants to surface waters that are distinct from other land uses like residential or open space. Not only are the pollutant types different but the quantities of pollutants also vary quite a bit. Nine different land uses were identified in this analysis:

Parkland
Open Space
Medium Density Residential
Trailer Parks
Manufacturing
Multiple Family Residential
Institutional
Freeways
Commercial Strip

The land use analysis is important and will allow planners to target specific land use areas for management actions designed to reduce or minimize pollutants reaching Lowes Creek. Table 3-3 reports the urban inventory results for pollutants currently being generated.

Table 3-3. Total Pollutant Loads by Type and Amount in the Urban Inventory of 1990 for Lowes Creek Compared to Predicted Loads in the Year 2010

Pollutant Type	1990 (lbs per year)	2010 (lbs per year)
Suspended solids	519,840 (260 tons)	1,476,743 (738 tons)
Phosphorus	1,179	3,230
Lead	235	542
Copper	122	275
Zinc	677	1,698
Cadmium	3	8

The difference in pollutant loads between 1990 and 2010 is caused by the increased amount of development expected in the project area. This development is predicted by the Regional Planning Commission based on techniques used in urban and regional studies. Because Lowes Creek is currently impacted by nonpoint sources the increased pollutant loads

associated with future conditions will degrade water quality to an unacceptable level. Management measures will have to be implemented to protect this water resource from the impacts of uncontrolled urban runoff. The analysis of urban nonpoint sources also included a prediction of the amount of water volume expected from continued development. Increased water volumes can present problems in several ways. Higher peak flows will likely cause more frequent and destructive flooding episodes due to the impervious nature of the future developments. These higher flows will also aggravate the problem of stream bank erosion and degrade streamside habitat. Runoff volumes predicted for the year 2010 are over two times greater than current runoff volumes. The need to control this runoff is required if water resources are to be protected. Chapter 4 details the management strategy proposed to deal with the problems caused by increased development.

The analysis of the project area included the identification of sub-basins that have hydrologic connections to Lowes Creek. Each sub-basin has some of the various land use categories and a review of the basins reveals that some are contributing pollutants at quite different rates. Table 3-4 presents the pollutant loads by sub-basin:

Table 3-4. 1992 Pollutant Loads by Sub-Basin in the Lowes Creek Project Reported in Pounds Per Year

Sub-Basin	Acres	Suspended Solids	Phosphorus	Lead	Copper	Zinc	Cadmium
Timber Creek	57	11,081	30	2	1	7	0
State Street	404	84,661	214	21	9	71	0
Non-Sewered West	3,163	478,679	1,255	108	60	367	0
Non-Sewered East	679	249,854	475	111	51	328	2
Lowes Creek South	51	10,554	27	2	1	8	0
Lowes Creek North	1,248	367,074	770	156	79	489	3
Carter - Vance	376	219,012	342	123	55	349	2
Bittersweet	225	55,828	117	18	18	79	0

Table 3-4 indicates that some of these individual drainage sub-basins contribute variable amounts of pollutants. This kind of distribution is caused by the fact that each sub-basin has different land uses in different amounts.

Table 3-5 reports the mass loads of sediment from the inventoried sources in the project area.

Map 3 - 1. Lowes Creek Priority Watershed and Sub Basin Map

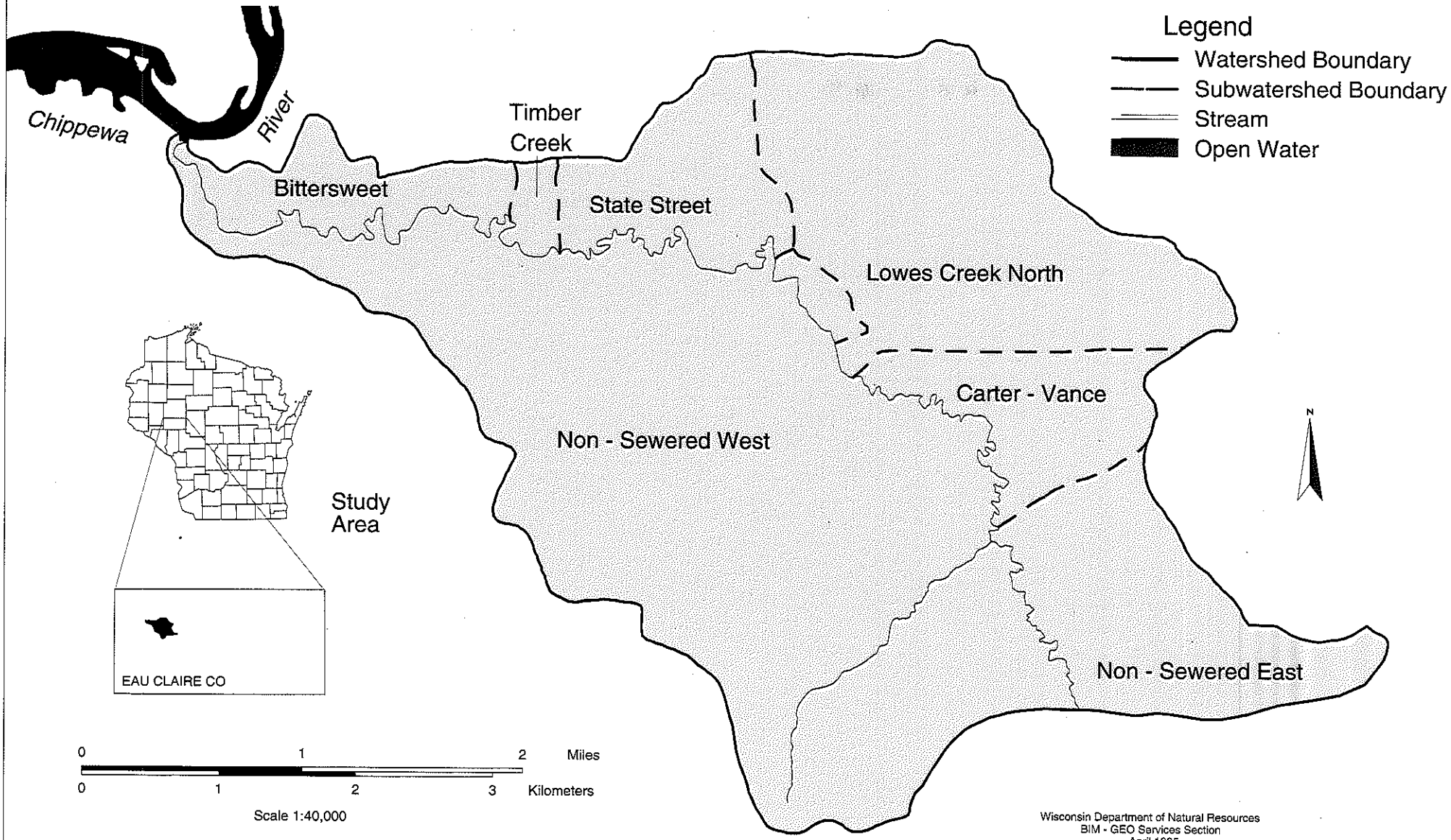


Table 3-5. Sediment Loads by Source

Source	Tons of sediment per year
Streambanks	1,050
Gullies	222
Urban runoff	260
Rural uplands	70
* Rural uplands did not receive a quantitative inventory but are described by the Eau Claire County LCD as at or below "T" values for erosion.	

Conclusions

- Lowes Creek is a Class II trout stream primarily limited by warm water temperatures and physical habitat conditions.
- Macroinvertebrate populations and overall habitat conditions generally improve moving downstream in the project area.
- The City of Eau Claire storm sewer discharge to Lowes Creek had minimal impacts on stream temperature during summer 1991.
- The storm sewer discharge had measurable water quality impacts for suspended sediment loading and metals discharges and temporary temperature increases downstream during runoff events. The discharge resulted in exceedances of toxicity standards in Lowes Creek for copper, lead and zinc. Erosion of the stormwater discharge structure contributed a significant quantity of sediment during several runoff events.
- Increases in stormwater runoff rates and volumes should be minimized to prevent additional streambank erosion and increased water temperatures from occurring in Lowes Creek.

Water Resource Objectives and Loading Reduction Goals

The primary objective of the Small Scale Priority Watershed Project is to protect Lowes Creek from further degradation. Some of the existing problems in Lowes Creek, such as excessive sedimentation and elevated water temperatures appear to originate upstream of the project boundary. However, an attempt should be made to minimize sediment and metals

loading from the project area, including existing and planned urban areas. The following water resource management objective is recommended for the project:

Protect the Class II trout fishery in Lowes Creek from further degradation by ensuring no net increase in pollutant loading from existing and future urban development.

The following loading reduction goals have been identified to achieve the project objectives:

- Maintain the current temperature regime in Lowes Creek by preventing increased thermal discharges from existing or future urban development.
- Provide a moderate level of sediment control from existing rural and urban areas, and a high level of control from future development.
- Provide a moderate level of control of metals loading from the existing urban area, and a high level of control from future development. Metals loading from the existing urban area should be reduced to levels that meet water quality standards in Lowes Creek.
- Maintain or reduce peak stormwater flow conditions from the existing urban area, and provide a high level of control of peak stormwater flow from future developed areas.

Other Pollutant Sources

The existence of additional pollutants is described briefly in this section of the plan. Several sources have been identified that may be affecting both surface and groundwater. Some of these sources are under permit and some are not, but the full extent of the pollution sources may be unknown at this time.

St. Bedes Priory is a permitted source and is located within the project area. Treated effluent is discharged into seepage ponds. Monitoring of this discharge found conditions to be within permitted limits. The average monthly flow for this facility is 130,000 gallons per month.

The existence of an older dump site is reported for an area along South Lowes Creek road. This site contains waste products from the 1940s that were dumped by unknown people. The waste products have been identified as manufacturing debris from the Gillette Tire factory and contain such things as curing bladders, sheets of natural and synthetic rubber and some hardware. Also found were three barrels of "banberry" sludge, a mixture of rubber, carbon black and oils. The three barrels have been removed but additional barrels are suspected. To date there has been no environmental testing at these sites.

Groundwater contamination has occurred near the present site of the Waste Research and Reclamation Company located along highway 93 just south of Eau Claire. This company provides services in chemical solvent recycling and disposal. Groundwater contamination has

been documented at this site and a program of remediation is presently underway. Various types of volatile organic compounds have been found in and around this site in groundwater and the site is currently being monitored by the DNR and EPA. There are 40 monitoring wells in place at this site with more planned for installation. The wells are being used to try and locate the contamination plume and define the extent of pollution. The Waste Research and Reclamation Company is pumping groundwater and treating it at three wells on the property and one well off the property. The objective at this site is to remove the pollutants. Both EPA and the DNR are reviewing plans for remediation but the cleanup of this site is predicted to take more than ten years. There is no evidence that any of the contaminants have reached Lowes Creek from this site.

Management of pollutant sources not related to the nonpoint program is the responsibility of other departments in the DNR. All of the sources described are currently being addressed by DNR or EPA.

CHAPTER FOUR
Recommended Management Actions

Rural Management Actions

Introduction

The development of management actions is based on the planning activities accomplished during the initial phase of the project. The land and water inventories of nonpoint pollution problems described in chapter 3 are analyzed in association with previously determined water resource objectives and pollutant reduction amounts required to achieve the objectives. The management actions will determine how many units of best management practices will be targeted for reduction. Landowner eligibility for cost-sharing will depend on whether that landowner's non-point source pollution levels fall within the targeted range of pollution quantities. For eligible landowners, all sources of pollution categorized as essential and required (Category 1) must be controlled as a requirement of participation in the cost-sharing program. The control of Category 1 sites is essential to achieving the water quality objectives. Category 2 sites are those sites which are considered eligible, but not required. The use of Category 2 allows a greater degree of flexibility for the landowner and provides a reasonable approach to controlling nonpoint sources that are difficult to correct. Category 3 sites are those sites with pollution quantities that fall below targeted levels and therefore are not eligible for cost-sharing.

The use of cost effective approaches allows the implementation of best management practices on those sites which are most likely to provide the most pollution control. The range of practices includes farm management activities like crop rotations to more structural practices like stream bank riprap. The implementation of the best management practices is further described in chapter 5.

Croplands and Other Rural Lands

Uplands were not quantitatively inventoried but croplands were assessed by the Eau Claire County LCD. The LCD concluded that most of these lands currently have an existing farm plan or have adequate protection that makes their sediment contribution of less importance than other sources. There is no specific sediment reduction goal for this source. Because of the possibility of changing farm practices and the fact that there are 1230 acres of this kind

of land in the project area an upland control strategy is proposed to keep all croplands at or below the "T" value. Table 4-1 lists the eligibility criteria for upland sediment control.

The term "T" represents the maximum amount of soil loss, in tons/acre/year that can be tolerated without causing a loss of productivity for a given piece of cropland. The Universal Soil Loss Equation (USLE) is a simple arithmetic equation used to calculate the actual soil loss, in tons/acre/year. Both "T" and the USLE are calculated based on information known about the climate, soil characteristics, topography and ground cover for the area.

Table 4-1. Upland Sediment Eligibility Criteria

Management Category*	USLE Rate	Target Reduction
1	>"T"	"T"
2	<"T"	(USLE) - 1
3	0	none

* See introduction for explanation of Management Categories

Control of gully erosion is set at 50% of the inventoried load. There are 40 sites of known soil loss delivering a total of 222 tons of sediment to Lowes Creek. Table 4-2 lists the eligibility criteria for gully erosion control.

Table 4-2. Gully Erosion Eligibility Criteria by Site

Management Category	Sediment delivered per/year	Target reduction to	# sites
1	>8 tons	1 ton	6
2	<8 tons to 3 tons	1 ton	8
3	<3 tons	none	26

Streambank Erosion Control

The streambank erosion inventory included 11,310 feet of streambank and found 1050 tons of sediment. Control of this source is set at 50%. This is the largest single source of sediment to Lowes Creek and therefore is a priority for control. None of the eroded bank area has the cattle access commonly found in many rural projects. Much of the streambank in this project is in a wooded corridor and relatively inaccessible. The cost effectiveness of

controlling streambank erosion is discussed in chapter 5 and is an important factor in determining the level of control for this source. Table 4-3 lists the eligibility criteria for streambank erosion control.

Table 4-3. Streambank Erosion Eligibility Criteria by Site

Management Category	Soil Loss Per/Year	Target Reduction to	# Sites
1	>30 tons	0	9
2	5-30 tons	0	17
3	<5 tons	none	75

Animal Lot Runoff Control

Animal lots were inventoried at all five sites within the project area. Quantitative surveys were not conducted but the county LCD did make notes about each site and provided information about recommended practices for each site. Because of the small number of animal operations and the conversion of farmland to urban land uses, problems from animal lots are expected to decline. Eligibility criteria for animal lots will be determined by the Western District Nonpoint Source Coordinator on an individual basis. Upon recommendation of the Eau Claire LCD one of the five lots is declared eligible and category 1 presently:

Management Category 1
Lot #8325281

Management Category 2
Lot #8343030
Lot #8322400
Lot #835661

Management Category 3
Lot #8357417

The remaining animal lots have been recommended for re-inventory by the Eau Claire LCD and will be surveyed in the second year of project implementation. The need for expensive barnyard runoff control systems is not apparent at any of these yards.

Manure Spreading Control

The county LCD did not conduct any animal waste spreading surveys. The five livestock operations are small and manure spreading was not identified as a nonpoint pollution source problem.

Easements

The Priority Watershed Program emphasizes the value of using easement purchases to provide water quality protection in streams. An easement purchase is the acquisition of specific land use rights, to accomplish a specific purpose. The rights purchased in a transaction will vary depending upon the buyer's purpose, and the nature of the land.

Within the Lowes Creek Priority Watershed two easement programs are currently available: Stream Bank Corridor Easements through the Wisconsin Stewardship Program and Nonpoint Source Easements through the priority watershed program. Subject to the approval of the Department's Area Fish Manager, all sites along the main stem of Lowes Creek are eligible for Stewardship Easement acquisition. Nonpoint Source Easements can be taken anywhere throughout the priority watershed if they meet the site specific criteria that are included later in this section and if they are approved by the Department's District Nonpoint Source Coordinator.

IMPORTANT NOTE: Given the small scale of this watershed project and the nature of the land use patterns adjacent to Lowes Creek, it has been decided that Stewardship Stream Bank Corridor Easements should be the easement of choice whenever that is possible. Sites that are eligible for Nonpoint Source Easement, but are not eligible for Stewardship Stream Bank Corridor Easements (or that are not approved by the DNR Area Fish Manager), can be considered for Nonpoint Source Easements. Sites that are eligible for either type of easement should be considered for Stewardship Stream Bank Easements.

The Wisconsin Stewardship Program is a 10-year, $250,000,000 program for conservation land acquisition established by the state legislature in July, 1990. The Stewardship Fund can be used for natural areas land acquisition, habitat restoration, trail establishment, and purchase of streambank easements. NR 50.01-50.05 and NR 51.001-51.003 guide the use of Stewardship funds for these activities.

Under the Stewardship program, $1,000,000 is available annually for the purchase of streambank easements to protect fishery habitat and water quality in streams and rivers. Streams eligible for Stewardship easements are placed on a priority list through a state selection process. The entire length of Lowes Creek has been identified as priority stream eligible for Stewardship funding for the purchase of streambank easements.

Stewardship easements are generally purchased with Stewardship funds by the DNR or a qualified non-profit organization, and are negotiated only with willing land owners. The terms of the easement are perpetual. The land use rights that are purchased are designed to assure that the easement corridor is maintained in a natural state and serves as a buffer to protect water quality and fishery habitat. Public access is allowed for compatible uses, such

as hiking or fishing. The Stewardship fund pays for fencing, if it is needed. The easement holder (DNR) can access the land for management activities to enhance water quality, fishery habitat, natural vegetation or wildlife. The easement agreement is generally tailored to the needs of each specific site. The corridor width must be a minimum of 66 feet landward from the stream bank, and generally ranges from 66 feet to several hundred feet.

The land owner retains the right to sell the land (although the easement stays with the land), and to use the land in any way that is compatible with the easement agreement.

The Stewardship program is funded and operates separately from the Priority Watershed Program, but the two programs can work in tandem to provide protection to streams. In fact, streams in Priority Watershed Projects are generally given high priority for Stewardship funding.

Stewardship easements are seen as an important tool for protection of Lowes Creek. The Eau Claire County Land Conservation Division will be working with the department to identify and contact riparian landowners along Lowes Creek, both within the project area, and along the rest of the length of the creek. These easement agreements should be acquired within the next six years. A more detailed plan for the use of easements in this project is included in chapter 6 Integration of Resource Management.

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 under 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 Lowes Creek 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.

2) When elimination of row cropping and the establishment of permanent vegetative cover will stabilize a critical area.

3) 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.

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.

Urban Management Actions

Urban pollutant loadings were calculated for eight subwatersheds within the Lowes Creek Priority Watershed. Within this chapter, quantitative results are given for the pollutants of Suspended Solids, Copper, Zinc, and Phosphorus. Besides these pollutants, flow and temperature are also estimated. Qualitatively, descriptions are given for the pollutants of PCBs, pesticides, bacteria, and PAHs.

Urban Nonpoint Source Pollutants

While there are many different types of pollutants in urban stormwater, certain pollutants cause more concern then others. In a study conducted in Madison and Milwaukee, Wisconsin in 1990-91, several inorganic and organic pollutants were considered critical to water resources. The term critical being defined as exceeding an acute toxicity level and an occurrence of at least 10% in all samples. Acute toxicity levels of the pollutants can be found in the Wisconsin Administrative Codes NR 102, 105, and 210. Of these critical pollutants, Suspended Solids, Lead, Copper, Zinc, and Phosphorus are estimated for the eight subwatersheds. Listed below are a short description and possible sources of these estimated pollutants:

Lead

Lead is a common pollutant found in most samples of urban runoff. Lead exceeded an acute toxicity at least once for all sites sampled, with Event Mean Concentrations (EMC) ranging from 3-570 μg/l, with the average EMC of 22.3 μg/l. The acute toxicity level for lead is 60.9 μg/l at a water hardness of 24. Probable sources include automobiles and industrial areas.

Copper

Copper was toxic in at least 45% of all samples taken. The EMCs range from 3-210 μg/l, with an average EMC of 22.3 μg/l. The acute toxicity level of Copper is 9.3 with a water hardness of 24. Sources of Copper include automobiles and industrial areas.

Zinc

Zinc was toxic in at least 45% of all samples taken. The EMCs ranged from 50 - 1500 μg/l, with an average EMC of 179 μg/l. The acute toxicity level of Zinc is 66 with a water hardness of 24. Probable sources of zinc include automobiles, industry, and rooftop downspouts.

Suspended Solids

This pollutant is always found in urban runoff. Suspended Solids were found to exceed at least 52% of all samples taken. The WPDES permit limit is 45 mg/l. The range of EMCs was from 2 - 1660 mg/l, with an average EMC of 123 mg/l. While many sources contribute suspended solids, the majority comes from construction site erosion.

Phosphorus

Phosphorus was found to exceed the permit level a maximum of 11% of the time. The EMCs ranged from .09 - 1.7 mg/l. The average EMC was 0.3 mg/l. Phosphorus comes from many different sources, but major concerns are fertilizer use, and leaves left in the street.

Water Volumes

Within sensitive streams such as Lowes Creek, water volumes will play a critical role in the habitat suitability for trout populations. Habitat and spawning beds may be destroyed by increases in water volume. In addition, the high flows will increase the scouring action causing more streambank erosion, this in turn will widen the banks and lead to more sediment entering the stream.

Temperatures

Thermal pollution can play a critical role in the degradation of a cold water stream. When more urban area is built along cold water streams, stream temperatures usually rise from the entering of warm urban stormwater. As stream temperatures rise, cold water species such as trout decline in population due to the shift in the temperature regime.

While these pollutants listed below are not estimated for the Lowes Creek Watershed, they still pose a threat and should be considered in the overall discussion of problem pollutants:

PCB

PCBs are found in urban stormwater in small amounts. The EMCs range from .10 - 10 μg/l, with a median of .02 μg/l. 100% of the samples taken exceed the Human Cancer criteria found in NR 105. Sources for this pollutant include industrial storage areas and airborne deposition.

Pesticides

Several different herbicides and insecticides are found in urban stormwater. Most herbicides found in urban stormwater pose little threat to the aquatic environment, but insecticides may threaten groundwater sources. Twenty six pesticides have been detected in urban stormwater, with some of these being corn herbicides.

PAH

Polycyclic Aromatic Hydrocarbons (PAHs) are formed by incomplete combustion when organic compounds are burned with insufficient oxygen. These materials can be absorbed onto suspended particles and biota. At least 60% of the samples taken statewide have exceeded Human Cancer criteria found in NR 105.

Bacteria

Surface water Bacteria guidelines were exceeded at least 90% of the time for all samples taken. The EMCs ranged from 60-9600 counts per 100 m/l. The average EMC was 6466 counts per m/l, with the exceedance level of 400 Mg/l.

Urban Land Use Pollutant Loads

Pollutant loadings are estimated for existing municipal land uses within the Lowes Creek Priority Watershed Project. Loadings are also estimated for the planned land uses within the urban service areas of the watershed. Listed in Table 4-4 are the annual pollutant loads for lead, copper, zinc, phosphorus, and suspended sediment. Because of the various land use mixes and sizes within each sub-basin, pollutant loads will vary from sub-basin to sub-basin. Table 4-4 clearly shows that certain subwatersheds will contribute more pollutants than others

Reduction Goals

The reduction goals for urban stormwater are based on the appraisal of the water resources within the watershed, these goals are also listed in Table 4-4.

A factor that needs to be addressed are the Federal Stormwater Regulations and how they affect the watershed plan. On November 16, 1990 the United States Environmental Protection Agency (EPA) published a final rule regulating municipal and industrial

stormwater discharges. Most industrial facilities and incorporated municipalities over 100,000 people need to obtain a stormwater permit. This permit is a three-phase process in which 1.) the permit application must be submitted, 2.) a monitoring program must take place for a certain period of time, and 3.) a control strategy must be implemented. The permit requirements will include best management practices to prevent pollutants from entering stormwater. These practices could range from storing materials indoors to wet detention basins.There will also be some numeric limits imposed on certain pollutants, but these have yet to be decided.

Just because a municipality does not fall under the EPA regulations now, it more than likely will in the future. In 1994, the next phase of permits will be required for municipalities under 100,000 people. At this time, the cut off limit is 50,000 people, which will include the City of Eau Claire.

Control of the industrial sources must be taken into account when setting reduction goals within a watershed. Listed below in Table 4-4 are the urban reduction goals associated with a 75% control level of suspended solids of industrial sources. The level of 75% is an arbitrary one, but should represent the control gained from the general permitting strategy. In essence, controlling the industrial loads will help with the overall reduction of pollutants in achieving the watershed goals.

Table 4-4. Urban Reduction Goals for the Lowes Creek Watershed (with EPA Industrial Stormwater Controls in Place)

	Lead	Zinc	Copper	Phos	Solid	Water Volume	Temp.
Existing (1992)	20%	20%	21%	18%	15-35%	10%	10%
Planned (2010)	90%	75%	75%	56%	90%	90%	90%

Management Alternatives

The urban stormwater management strategies for this watershed are broken into existing and future land uses. Listed in Table 4-5 are the management alternatives selected for this watershed. Two key concepts that must be understood is the relationship between existing and future land use development and the idea of critical nonpoint source polluting land uses.

The idea behind existing and future land use development relates back to trying to keep the waterbody in a state no worse then it is now. What this entails is a combining of both the existing pollutant numbers along with the future pollutant loading numbers to obtain an "ultimate" loading number for a municipality. This "ultimate" loading number is for the year 2010.

The other concept that needs exploring is critical nonpoint source polluting land uses. The estimation of pollutant loads relies on land use definitions. Each land use is assigned a pollutant load number and estimates are made for a yearly pollutant load using both EMCs and lbs/year. When working through the management alternatives, the first target of control are those heaviest polluting land uses, and occasionally the lighter loading land uses will also have to be included to obtain the desired reductions needed.

To protect Lowes Creek from further degradation, a 4-step approach should be considered for urban stormwater runoff. These four steps are listed in table 4-5. As with any future development and stormwater, the first step is flood control, with the intent of reducing channel destruction. The second step, a generic urban nonpoint source control, is intended to reduce the increase of pollutant loads to the watershed. The third step, generic urban stream protection, has a goal to reduce the magnitude of the severity of urban stream degradation that is likely to occur within the system. The fourth step, control of nonpoint source specific pollutants, is to reduce the delivery of pollutant loads such that a specific water quality standard or pollutant load allocation can be met; and the last goal, protection of sensitive streams, has the goal to maintain the integrity of the pre-development stream system.

Table 4-5. Lowes Creek Watershed Urban Alternatives

Management Alternatives
1 - Do Nothing
2 - Flood control
3 - "Generic" Urban nonpoint source control
4 - "Generic" urban stream protection
5 - Protection of sensitive streams (Lowes Creek)

Management Action 1 - Do Nothing

Under management action 1, further degradation of Lowes Creek will continue. Developed lands within the Watershed are expected to increase by 201% within the next twenty years along with large pollutant increases. The pollutant load changes can be found in Table 4-6.

Table 4-6. Pollutant Load and Relative Changes in the Lowes Creek Priority Watershed

	Year 1992	Year 2010	Change	% Relative Change
Dev. Land (acres)	2,074	6,243	4,169	201%
Solids (lbs/year)	519,840	1,476,743	956,903	184%
Phosphorus (lbs/year)	1,179	3,230	2,051	173%
Lead (lbs/year)	235	542	307	130%
Copper (lbs/year)	122	275	153	125%
Zinc (lbs/year)	677	1,698	1,021	150%
Cadmium (lbs/year)	3	8	5	166%
Water Volume (Gallons)	423,039,846	1,040,802,321	617,762,475	146%

Two key indicators of further degradation within the watershed are the amount of impervious land that drains to Lowes Creek and the potential temperature increase in the stream.

The impervious area of a watershed is the amount of lands that do not allow for infiltration of stormwater. A typical medium density residential area has an impervious area of approximately 35%, while a commercial strip area may have an impervious rate of 90%. The present impervious area of the watershed is approximately 16%. Recent work done by Schueler (1990) suggests that for a sensitive stream, an impervious rate below 15% will have no impact upon the water resource. But once the impervious area reaches a range of 15-20% moderate impacts are felt upon the resource; these impacts can include loss of habitat, more frequent flooding, and general decline in sensitive fish populations. When the planned impervious areas are added to the existing impervious areas of Lowes Creek, the new impervious rate will be approximately 35%. A 35% impervious rate will have severe impacts upon the trout population within Lowes Creek.

As the impervious area rises, so will the stream temperature. Within a cold water stream, temperature will also play a large role in how well a water resource can support a cold water fishery population. Through appraisal and monitoring activities, water temperatures are well

within Brown Trout ranges as shown in Table 4-7. But as impervious areas rise, so do stream temperatures, and by the year 2010, the predicted average and maximum temperature ranges for Brown Trout will have been surpassed.

Table 4-7. Predicted Increase in Stream Temperature from Urban Development within Lowes Creek (16% vs. 35% Impervious)

	Mean Temperature °F	Maximum Temperature °F
Existing Conditions - 16% Impervious (1992)	62	71
Planned Conditions - 35% Impervious (2010)	67	82
Brown Trout Maximum Optimum Range is 66 °F Brown Trout Maximum Upper Limit is 81 °F		

If management action 1 is carried out, there is a high chance of Brown Trout extinction, increased flooding, further streambank erosion, and loss of an attractive setting.

Management Action 2 - Flood Control

At a minimum, flood control is required for protection of human lives and property. At present, a 100-year flood plain has been established for existing conditions. But this flood plain will change over time with the expected increase in urban development, and existing development may be endangered from more frequent flooding problems. A recommendation for flood control is to reevaluate the 100-year flood plain and establish new boundaries within the watershed based upon the 2010 year developed conditions. In addition, on site infiltration and regional facilities will be needed. These facilities should control the peak runoff from these sites for the 100-year event. Special considerations are needed for existing property owners to ensure no unnecessary destruction is associated with the increased flow. Table 4-8 lists the overall reductions of potential impacts associated with Lowes Creek. Although flooding will be controlled, this management action will result in further degradation of the stream.

Table 4-8. Management Action 2 - Flood Control - Lowes Creek Priority Watershed

Problem	Flood (100 year event)	Water Volume	Temp.	Total Suspended Solids	Phosphorus	Heavy Metals
control rates for existing and planned areas	High >50%	Mod. 25-50%	Low <25%	Low <25%	Low <25%	Low <25%
Targeted areas for flood control included all lands to be developed within the next twenty years.						

Management Action 3 - "Generic" Urban Nonpoint Source Control

Management action 3 consists of controlling "generic" urban nonpoint source pollutants. The term "generic'" refers to the most common of urban nonpoint source pollutants: total suspended solids, and phosphorus. The object of this strategy is to reduce the magnitude of the increase in urban nonpoint source pollution within the watershed.

The tools for this management action will include moderate control levels of construction site erosion; moderate control of source areas from newly developing area, and control of the 2-year 24 hour storm. These tools along with the tools in management action 2 can be used for limited control on urban nonpoint source pollutants.

Table 4-9 lists the overall reductions of potential impacts associated with Lowes Creek. This management action will result in further degradation of the stream.

Table 4-9. Management Action 3 - "Generic" Urban Nonpoint Source Control Lowes Creek Priority Watershed

Problem	Flooding (100 year event)	Water Volume	Temp.	Total Suspended Solids	Phosphorus	Heavy Metals
control rates for existing and planned areas	High >50%	Mod. 25-50%	Low <25%	Mod. 25-50%	Mod. 25-50%	Low <25%
Existing Land uses - limited source area controls; Information and education activities Planned Land Uses - 50% control of construction site erosion; BMPs to control the 2 year 24 hour storm for water quality						

Management Action 4 - "Generic" urban stream protection

Management action 4 consists of reducing the severity of urban stream degradation that is likely to occur. Additional BMPs such as stream buffers, extended detention / infiltration basins to control frequent flooding, along with some watershed and environmental planning.

A common BMP used for stream protection are stream buffers. These buffers are used to protect the riparian habitat, maintain stream temperatures, and improve the setting of the surrounding areas. The Department can acquire stream buffers through easements along the stream corridor. The minimum stream corridor easement depth is 66 feet on either side of the stream, but deeper easements may be necessary in certain cases.

Another common BMP for stream protection is extended detention / infiltration to control frequent flooding. This BMP is used to reduce the peak flows from the most common flooding events. The frequency of these events usually range from 10 to 50 year storm event. The ideal control of these events is to not allow post development rates for the 10-50 year event to exceed the pre-development rate. This will require enhancements to the 100 year flood control structures to control the smaller, more frequent storm events. This control can be gained by installing weirs, multiple pipes, or other flow control outlet devices.

A form of stream protection that requires no BMPs are watershed and environmental planning to direct stormwater away from sensitive areas of the stream. This includes avoiding direct discharges to spawning beds or highly erodible areas of the stream. This can also

include setting aside more open spaces along or near the stream for protection of wildlife habitat.

This management action will reduce the severity of degradation that will occur with the urbanization of the watershed, but it will not preserve the stream at its natural state.

Table 4-10 lists the overall reductions in problems associated with Lowes Creek. This management action will result in further degradation of the stream.

Table 4-10. Management Action 4 - "Generic" Urban Stream Protection Lowes Creek Priority Watershed

Problem	Flood (100 year event)	Water Volume	Temp.	Total Suspended Solids	Phosphorus	Heavy Metals
control rates for existing and planned areas	High >50%	Mod. 25-50%	Mod. 25-50%	Mod. 25-50%	Mod. 25-50%	Mod. 25-50%
Management Actions 2 and 3 + Existing Lands - Aggressive information and education activities Planned Lands - Extended infiltration / detention Stream buffer strips Avoid direct discharge to sensitive stream areas						

Management Action 5 - Protection of Sensitive Streams (Lowes Creek)

Management Action 5 is the recommended alternative for the Lowes Creek Priority Watershed. *This is the management action that will be eligible for cost share dollars.* This management action consists of a high control rate for construction site erosion, sophisticated BMP design, expanded stream buffers, active stream stewardship, and restrictions on watershed and site imperviousness, and the other recommendations listed in actions 2, 3 and 4. Only through these activities will Lowes Creek be able to support a Brown Trout population into the extended future.

The first step in an effective strategy is to mitigate any existing problems that may affect water quality. Through the appraisal process, a moderate level of control is needed for sediment and heavy metals. This control can be obtained by using various non-structural best management practices. These practices include street sweeping once a week for existing

land uses within the watershed. These practices also include timely collection of leaves in the fall of the year. Another non-structural practice will be the possible reduction of sand and salt use within the watershed. Recommended application rates for sand range from 500-1000 lbs. per mile.

Because of the nature of the stream, few impacts have been felt from the existing urban areas, it is the future development that will have the largest impact upon the resource. Listed below are recommendations for the future development of the Lowes Creek Watershed:

Construction Site Controls

It is recommended that Eau Claire County adopt a construction site erosion control ordinance for the County. A special consideration should be given to Lowes Creek, with a high level of control (75%) to be obtained within the watershed. Enforcement measures must be maintained for a high control rate.

Stream Buffers

Stream buffers should be wider than the 66 foot minimum set forth by the Department. It is recommended that a buffer depth of 100 to 200 feet should be considered as the minimum needed for stream integrity. While 66 foot buffers should be obtained where feasible, more depth should be acquired when possible.

Active Stream Stewardship

An aggressive effort should be undertaken to maintain the Lowes Creek Agreement. This Agreement is a binding legal document that requires stormwater controls in newly developing areas.The Lowes Creek Watershed Association should take a more assertive role in the enforcement of the Lowes Creek Agreement. It is recommended that this agreement be amended to require review and approval of stormwater discharges for the remainder of the development to take place. This amendment should reflect the recommendations that have been stated in this plan.

Sophisticated Best Management Practices

The development, design, and installation of best management practices will take special care within the watershed. There are six considerations for an effective BMP system, they are: runoff attenuation, runoff conveyance, runoff pretreatment, runoff treatment, monitoring of performance, and system maintenance. Listed below in Table 4-11 are the BMP requirements needed for developing areas within the Lowes Creek Priority Watershed.

Table 4-11. General Best Management Practice Requirements Needed On New and Developing Lands

Best Management Practice Component	Actions Needed For This Component
Runoff Attenuation	Reduce peak post flow rates to pre - development conditions. 2, 10, 50, 100 year rates must be considered. Reduce post flow volumes to the maximum extent possible by infiltration.
Runoff Conveyance	Encourage the use of grass swales where possible. Protection of stormdrain outfalls.
Runoff Pretreatment	Use catchbasins, sediment fore bays or settling basins as a pretreatment of stormwater BMPs. Use grass filter strips as part of infiltration devices. Encourage the use of on-site BMPs where possible.
Runoff Treatment	Use BMPs to control 90% of Total Suspended Solids. Encourage the use of on-site BMPs where possible.
Monitoring	Develop monitoring plans for BMPs.
System Maintenance	6 month inspection of BMPs. Easy access to and around BMPs. Infiltration soil replacement on a 5 year basis. Sediment disposal plan. Financing mechanisms for BMP maintenance.

An example of these considerations has been the Nonpoint Source Demonstration Project located at the intersections of Interstate Hwy. 94 and State Hwy. 93. This site incorporates both on-site best management practices along with a regional control facility. For a complete description of this site refer to Appendix A.

General Development Restrictions

The highest level of stream protection is undertaken when a development ordinance is adopted by a community, and administrated by a single planning authority. In this case, the township of Washington, the City of Eau Claire, and Eau Claire County should adopt an ordinance that sets minimum levels for stream buffers, steep slope restrictions, upland and

riparian tree cover requirements, and community open space requirements, with administration carried out by Eau Claire County.

Stormwater Ordinance (Minimum Requirements)

Minimum stream buffers should meet the minimum 66 foot requirement set forth by the Department for acquisition of streambank easements. But, as was stated above, an ideal easement would be from 100 to 200 feet adjoining the Creek.

Steep slope restrictions should also be enforced. No clearing or grading should be permitted on slopes in excess of 20% that adjoin the Creek. This restriction should tie into the acquisition of stream bank buffers.

Tree cover should be maintained after a site has been developed. There should be a minimum of 50% left after development has occurred. The riparian tree cover should be left in place as much as possible; and where disturbed, replanting should take place. Where possible, tree saving areas should be lumped into large blocks tied into the buffer system rather than small isolated stands. Numerous studies have shown that local wildlife diversity cannot be maintained in small islands of trees surrounded by urbanization (Hench, 1986).

Open space requirements are a key component to preservation of Lowes Creek. This concept goes beyond just requiring a set percentage of open space within the Watershed, it also has to limit the development of certain land uses. By limiting the development of certain land uses, the overall impervious area can be reduced, this in turn will protect the Creek. If the imperviousness of an area is reduced, the number of BMPs can also be reduced. Listed in Table 4-12 are different land use alternatives that will reduce the amount of impervious area within the watershed. The ideal target for imperviousness of the Watershed would be below 20% and that target can be reached with land use changes. It should be noted that even with the land use changes, BMPs are still required for those lands.

Table 4-12. Alternative Land Use Scenario for Reduction of Planned Impervious Area Within the Lowes Creek Watershed.

OPTION	% of Total Impervious	Approximate Storage Capacity Needed for Control of the 100 year event (Acre Feet)
OPTION 1 - No changes to planned land use	35.3%	78.22
OPTION 2 - Change planned medium density residential to low density residential	27.1%	52.6
OPTION 3 - Change planned medium density residential to low density residential plus no commercial development	19.4%	34.38
OPTION 4 - Change planned medium density residential to low density residential plus no commercial development or multi-family development	18.9%	32.36

The scope of authority for controlling land use decisions rests upon a number of entities. Each of these entities has certain powers to control land uses and improve water quality. Table 4-13 lists the scope of authority for each of these entities.

Under state statute local governments and counties have powers to create and enforce stormwater and construction site erosion ordinances. The County's jurisdiction covers all unincorporated areas; and will also extend into annexed lands that do not have an ordinance as strict as the County's. A construction site erosion ordinance is needed for the Watershed. It is recommended that Eau Claire County adopt both a stormwater management ordinance and a construction erosion ordinance to ensure that proper stormwater practices be installed. It is also recommended that the City of Eau Claire adopt a similar ordinance equal to the County's.

Table 4-13. Scope of Authority for Land Use and Water Quality Decisions

Activity	DNR	Regional Planning Commission	County	Local Government
Water quality Planning	S	D	D	
Groundwater Management	S	D	D	
Lake Management Planning	S	D	D	
Stormwater Management	S	A	S	S
Isolated Wetland	S			
Land Use Planning		S	S	S
Zoning / Land Use Control		A	S	S
Preserving Land	S		S	S

S = Statutory Authority D = Delegated Activity A = Advisory

The DNR has three tools for water quality planning, these are point source controls, limited stormwater management controls, and sewer service area delegation. Under the sewer service area delegation the Department has certain controls over land use development within the community if water quality is threatened. Because of the possible impacts from development within the Lowes Creek Priority Watershed, it is recommended that no more sewer service area amendments take place within the boundaries of the Watershed.

With management action 5, a moderate to high level of control will be obtained for all categories. Table 4-14 lists the overall rate of control and actions needed for achievement of this recommendation.

Table 4-14. Management Action 5 - Protection of Lowes Creek - Lowes Creek Priority Watershed

Problem	Flood	Water Volume	Temp.	Total Solids	Phosphorus	Heavy Metals
control rates for existing and planned areas	High >50%	Mod. - high 25-50%	High >50%	High >50%	Mod.- High 25-50%	High >50%
Management actions 2,3,4 +						
Existing lands - Street sweeping once a week for all existing land uses Aggressive leaf and lawn pick up Planned lands - Stormwater ordinance with minimum requirements Minimum stream buffers of 100-200 feet Minimum tree coverage for each site Steep slope development restrictions Open space requirements Amendment to the Lowes Creek Agreement High (75%) control rate of construction site erosion Sophisticated BMPs (Table 4-11)						

Summary Of Urban Recommendations

The protection of Lowes Creek can only be accomplished through a dedicated effort from the Townships of Washington and Brunswick, City of Eau Claire, Eau Claire County, and The West Central Regional Planning Commission. Table 4-15 summarizes the recommended management actions need for each alternative.

Table 4-15. Recommended Management Actions for Nonpoint Source Control in the Lowes Creek Priority Watershed.

Watershed Target	Minimum Tools Needed to Achieve Target
Flood Control	Flood Plain Restrictions. Infiltration basins for peak shaving.
"Generic" Urban Nonpoint Source Pollutant Control	The above tools + Standard construction site erosion control. Use of BMPs to control the 2 year / 24 hour storm event.
"Generic" urban stream protection	The above tools + Additional use of infiltration to control bankfull flooding (10,50, or 100 year storm). Designation of stream buffers. General and site-specific development criteria.
Protection of Sensitive Streams (Lowes Creek)	The above tools + Expanded stream buffers. Severe limits on watershed and site impervious. High construction erosion control. Active stream stewardship. Sophisticated BMP design (infiltration of 100 year event). Limit sewer service area extensions

CHAPTER FIVE
Local Government Implementation Program

Introduction

This chapter identifies the means for implementing the management actions for nonpoint source control described in Chapter 4, and describes the county's nonpoint source implementation strategy for rural areas. Included in the implementation program for rural areas is an information and education strategy. The success of this priority watershed project depends on the aggressive implementation of these nonpoint source control strategies.

More specifically this chapter identifies:

1) The agencies and units of government responsible for carrying out the identified tasks,

2) The best management practices (BMPs) necessary to control pollutants on the critical sites identified in Chapter 4,

3) The cost-share budget,

4) The cost containment policies,

5) The cost share agreement reimbursement procedures including administrative procedures for carrying out the project,

6) Staffing needs including total hours per year and number of staff to be hired,

7) Schedules for implementing the project,

8) The involvement of other programs,

9) The information and education activities that will be carried out in the project area, and

10) The project budget including the expense for cost-sharing, 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 pollution and protect and enhance fish, wildlife, and other resources. Land owners and land operators in the Lowes Creek Watershed eligible for cost share assistance through the priority watershed program include: 1) individuals, 2) Eau Claire County, 3) other governmental units described in NR 120.02(19), 4) corporations, and 5) the State of Wisconsin.

Eau Claire County is the primary unit of government responsible for implementing this plan.

The Eau Claire County Land Conservation Division (LCD) will act for the County Board, and be responsible contractually and financially to the State of Wisconsin for management of the project. The county LCD will coordinate the activities of all other local agencies involved with the project.

The specific responsibilities for Eau Claire 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 at least once during the cost sharing sign-up period. The counties' strategies for contacting landowners are 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 terms and conditions of cost-share agreements as defined in s. NR 120.13, Wisconsin Administrative Code.

5) For lands the county owns and 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 Eau Claire County LCD shall submit a workload analysis and grant application to the DATCP as required in s. Ag. 166.50.

9) Prepare and submit to the DNR and 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 for 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.

DNR

The role of the 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 the 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 Lowes Creek Watershed is included in Chapter 8.

The DNR documents the results of monitoring and evaluation activities in final priority watershed project reports.

Technical Assistance

The DNR provides technical assistance to the county and cities 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 selection and design of BMPs.

DATCP

The role of the 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 (BMPs),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 BMPs.

Other Agencies

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

Soil Conservation Service (SCS)

This agency works through the local LCD 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 Division and if SCS staff time is available. Personnel for the Area SCS office will provide staff training and engineering assistance for best management practices. Efforts will be made by the DATCP to assist SCS to coordinate the Lowes 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 conservation activities. The Agricultural Conservation Program (ACP) which is administered by ASCS will, to the extent possible, be coordinated with the Lowes 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 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 under the Lowes Creek Priority Watershed Project are listed in Table 5-1. The cost share rates for each BMP are also found in Table 5-1. Practices using a flat rate for state cost share funding are shown in table 5-2.

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 alternative design criteria based on the provisions of NR 120.15 where necessary to meet the water resource objectives.

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 taken during the planning, design, and installation of BMPs to prevent or minimize the loss of existing wildlife habitat.

Table 5-1. State Cost-Share % Rates for Best Management Practices*

BEST MANAGEMENT PRACTICE	STATE COST SHARE RATE
Contour farming	50% [1*]
Contour and field stripcropping	50% [1*]
Reduced tillage	50% [*]
Shoreline and streambank stabilization	70%
Livestock exclusion from woodlots	50% [*]
Field diversions and terraces	70%
Grassed waterways	70%
Critical Area Stabilization	70% [2]
Grade Stabilization Structures	70%
Agricultural Sediment Basins	70%
Shoreline Buffers	70% [2]
Wetland Restoration	70% [2]
Nutrient & Pesticide management	50% [3*]
Barnyard Runoff Management	70%
Animal Lot Relocation	70%
Manure Storage Facilities	70% [4]

Table 5-1. State Cost-Share % Rates for Best Management Practices*

BEST MANAGEMENT PRACTICE	STATE COST SHARE RATE
Sinkhole and Crevice Treatment	70%
Well Abandonment	70%

[1] Wildlife habitat re-creation has a state cost share rate of 70%.

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

[3] Spill control basins have a state cost share rate of 70%.

[4] Maximum cost share amount is $20,000 including no more than $5,000 for manure transfer equipment. (Legislation is proposed that could affect these amounts. If the legislation is adopted the cost share amount will correspond with the new statutory language).

* See Table 5-2 for BMPs cost shared at a flat rate. Table 5-2 lists maximum state cost share flat rates. The watershed project should use either a percentage cost share rate or a flat cost share rate for each practice.

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

BEST MANAGEMENT PRACTICE	FLAT RATE
Contour Farming	$ 600/ac *
Contour Strip Cropping	$ 1200/ac *
Reduced tillage	$ 4500/ac 2
more than three years of continuous row crops	
Reduced tillage	$ 1500/ac 1
Fencing	
Multi strand barbed wire	$ 1260/rod
High tensile electric	$ 1400/rod
Single strand electric	$ 840/rod
Nutrient and Pest Management	$ 2500/ac 3

* Wildlife habitat restoration components of this practice are cost-shared at 70%.
1 Reduced tillage systems for short crop rotations, and establishment of forages and small grains (includes no-till). One year only.
2 Reduced tillage systems for continuous row cropping over three years (excluding no-till).
3 Nutrient and pest management practices will be cost-shared on a flat rate per practice.
$25.00/ac is the total cost-share rate over three years.

Following is a brief description of some of the most commonly used BMPs included in Table 5-1. A more detailed description of these practices can be found in NR 120.14.

1. Contour Farming and Contour Strip-cropping - Growing crops in a systematic arrangement, usually on the contour, in alternate strips of close grown crops, such as grasses and legumes, and tilled row crops.

2. Reduced Tillage - A system which leaves a roughened surface or substantial amounts of crop residue in or on the soil surface after crops are planted. The system consists of no more than one primary tillage pass in the fall or spring, and no more than two passes with light or secondary tillage equipment prior to planting. It is utilized in two situations; one for continuous row crops or long corn rotations, the other for short crop rotations or for the establishment of forages and small grains.

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

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

5. Grade Stabilization Structure - A structure used to reduce the grade in a channel, to protect the channel, or to prevent the formation or advance of gullies.

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

7. 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 fencing and rip rap. It may also include pasture pumps for watering livestock excluded from water bodies, sloping and seeding, bioengineering and trout structures.

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

9. Field Diversions - The purpose of this practice is primarily to divert excess water away from areas in which it is doing damage, to where it can be transported safely.

10. Barnyard Runoff Management - Structural measures such as filter systems and/or diversions to redirect surface runoff around the barnyard, and collect, convey or temporarily store runoff from the barnyard.

11. 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 nutrient management plan.

12. 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.

13. 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.

14. 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 the surface or ground water.

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

16. Sinkhole and Crevice Treatment - The protection of ground water by diverting surface runoff away from critical sites.

17. 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 ground water. This practice includes manure nutrient testing, routine soil testing, and residual nitrogen testing.

18. Pesticide Management/ 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 pesticide entering surface and ground water. This practice includes crop scouting and pest management planning.

19. Shoreland/Upland Grazing Management - A management plan that provides for the maintenance of a vegetated buffer along the banks of streams, lakes and drainage ways in the presence of livestock. The objectives of the practice are to buffer nutrient runoff, protect fish and wildlife habitat, reduce bank erosion and instream turbidity, and preserve stream channel structure. Plans will be based on SCS Standard 510, 512 and UWEX guidelines. Structural practices such as fencing, stream crossings, watering access, watering facilities, spring development, and streambank and shoreland protection may be included in the practice. Implementation of shoreland grazing management will take one of the following forms based on an evaluation of both environmental and management factors:

a. Livestock Exclusion - Total livestock exclusion through the use of fencing or relocation, from all or portions of the shoreland. Used when other means can not be expected to provide adequate shoreland protection.

b. Limited Term Grazing - A grazing plan developed using SCS 510 as a general guideline, and generally used in conjunction with other streambank and woodlot protection BMPs, to ensure the protection of surface waters from livestock. Controls animal density (stocking rate) to maintain vegetative cover and limits grazing to a period from late spring to early fall.

c. 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.

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

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

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 listed below.

a. That portion of a practice to be funded through other programs.
b. Practices previously installed and necessary to support cost-shared practices.
c. 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.
d. Changes in location of unconfined manure stacks involving no capital cost.
e. Manure spreading management.
f. Other activities the DNR, Eau Claire County and DATCP, 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.

a. Operation and maintenance of cost-shared BMPs,
b. Actions which have drainage of land or clearing of land as the primary objective,
c. Practices already installed, with the exception of repairs to practices rendered ineffective, due to circumstance beyond control of the landowner.
d. Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) Program or covered in other ways by Chapter 147 of Wis. Stats. (including livestock operation with more than 1,000 animal units, or livestock operation issued a notice of discharge under ch. NR 243),
e. Septic system controls or maintenance,
f. Dredging activities,
g. Silvicultural activities,
h. Bulk storage of fertilizers and pesticides,
i. Activities and structures intended primarily for flood control,
j. Practices required to control sources which were adequately controlled at the time the cost-share agreement was signed,
k. Other practices or activities determined by the DNR not to meet the objectives of the program.

Urban Program for Implementation

Sequence of Urban Management Program Activities

The following discussion provides guidance on how the urban nonpoint source control program will be implemented. It considers first, the elements of a "core" program for controlling urban nonpoint sources. Second, the implementation of more complex "segmented" elements of the urban management program--detention, infiltration, street sweeping--are presented.

Core Elements of the Urban Management Program

The core elements of the urban nonpoint source control program applicable to local units of government include basic measures that can be implemented without further study. Adopting a local unit of government specific core program is the first step in the implementation process. A governmental unit will need to commit to implementing the core program within the first three years of the project. This is a requirement to receive technical and financial assistance through the priority watershed project. This requirement applies only to the receipt of funds used directly by the unit of government as a grantee, such as where the unit of government installs, owns, and operates a BMP. It does not apply to those instances where the unit of government acts as a grantor, passing cost share funds through to private landowners. This means that individual landowners could receive cost-share funds from the

DNR for the installation of BMPs prior to a unit of government's agreement to conduct core elements of the urban program.

The basic elements of the core program are:

Effectively enforce the construction erosion control provisions in local ordinances based on the state model ordinance and state building codes.

Develop and implement a unit of government specific program of urban "housekeeping" practices which reduce urban nonpoint source pollution. This may include a combination of efforts such as an information and education program, adoption of ordinances regulating pet wastes or changes in the timing and scheduling of leaf collection.

Implement an information and education program containing the elements and achieving the goals of the strategy presented in Chapter 6.

Following the completion and adoption of the DNR Storm Water Management Guidebook (in preparation), *it is recommended but not required*, that a storm water management ordinance be incorporated into the core program.

Segmented Elements of the Urban Management Program

The segmented elements of the urban nonpoint source program include those requiring site specific investigations prior to installation (example: detention ponds needing an engineering feasibility study).

Importantly, the higher costs of implementing this portion of the urban management program will require units of government to budget expenditures over the course of several years. Best management practices implemented under this portion of the program likely will include detention ponds, infiltration devices, stream bank erosion controls and other structural means for reducing urban nonpoint source pollution. These elements also include changes in schedules and equipment used for street sweeping.

The detailed studies will include engineering feasibility and other site specific investigations for existing and new development. The results will determine the best means for reducing urban nonpoint sources in a specific unit of government by more site specific application of the plan's recommendations.

Units of Government can implement the segmented elements of the urban management strategy any time following development and initial implementation of the core program. However, cost sharing will be limited to segmented program activities completed within the eight year implementation period.

The basic elements of the segmented program are:

Conduct detailed engineering studies to determine the best means to implement nonpoint source control measures for existing urban areas. These studies should set forth the allocation of local costs between municipalities where more than one unit of government contributes runoff to a BMP. The allocation should result in an equitable distribution of costs based on the contribution of each unit of government to the total pollutant loading or storm water runoff volume being controlled. This element will also consider accelerated street sweeping as a component of the control strategy for existing urban areas.

Design and install BMPs for existing urban areas, including detailed engineering studies.

Develop, as needed, stormwater management plans for existing and planned urban development. These plans will identify the type and locations of BMPs.

Adopt and enforce a stormwater management ordinance consistent with the State's model storm water ordinance (in preparation).

Program Participants--Roles and Responsibilities

The specific roles and responsibilities for program participants are summarized below. The primary participants include local units of government (cities, towns, counties, lake management districts), the DNR, other state agencies, watershed associations, landowners and land operators. Where applicable, the roles and responsibilities are discussed according to the previously described core and segmented approaches to project implementation. As noted in Chapter I, "Plan Purpose and Legal Status," implementation begins following approval of this priority watershed plan by Eau Claire County, the DNR and the Watershed Conservation Board.

Local Units of Government Core Program Roles and Responsibilities

The following is a schedule for implementing the core elements of the urban nonpoint source control strategy for this priority watershed project. Schedules may be amended as necessary at the annual meetings, upon agreement with the local unit of government and the DNR. Each participating unit of government should:

1. Identify in writing an authorized representative for the local unit of government within 30 days of the start of implementation.

2. Identify the roles and responsibilities of the cities, towns, counties, lake management districts, developers, contractors, and landowners for controlling construction erosion in all areas of the watershed within 12 months of the start of implementation.

3. Develop and implement a community specific program of urban "housekeeping" practices which reduce urban nonpoint source pollution. This may include but is not limited to a combination of information and education efforts, adoption of ordinances regulating pet wastes, and changes to the timing and scheduling of leaf and yard waste collection. The activities of the unit of government specific program and a schedule for implementation will be negotiated by the local unit of government and the DNR within 18 months of the start of implementation.

4. Implement the information and education strategy as described in Chapter VI.

5. Prepare and submit annual work plans for staff and activities necessary to implement the project.

6. Prepare and submit to the DNR an annual report for the purpose of monitoring project implementation.

7. Participate in the annual watershed project review meeting.

Local Units of Government Segmented Program Roles and Responsibilities

The following is a schedule for the segmented elements of the urban nonpoint source control strategy for this priority watershed project. Schedules may be amended as necessary at the annual meetings upon agreement with the local unit of government and the DNR. Each unit of government wishing to participate should:

1. Identify within 12 months of the start of implementation, the high priority sub-basins the unit of government wishes to address in existing and planned urban areas through the priority watershed project. This list can be amended throughout the 8 year project period.

2. Conduct engineering feasibility and site location studies for urban nonpoint source control practices in high priority areas for existing urban development. A commitment to implementing the recommendations will be required as a condition for financial assistance for these studies.

3. Develop proposed language for subdivision code changes to enforce construction erosion control ordinances and building codes in the unit of government within 36 months of the start of implementation.

4. Develop proposed language for subdivision code changes to enforce stormwater quality control ordinances and building codes in the unit of government within 36 months of the start of implementation.

5. Enter into cost-share agreements for eligible best management practices.

a. For practices installed and maintained by private individuals, the cost-share agreement is between the landowner and the local unit of government. The local units of government will be required to:

Design or contract for the design of best management practices and verify proper BMP installation.

Request reimbursement from the DNR for practices installed by private landowners. Eligible BMPs must be listed in the cost-share agreement signed prior to construction.
Reimburse landowners for the eligible amount of cost sharing.
Monitor landowner compliance with provisions of the cost-share agreement.

b. For practices installed and maintained by a local unit of government, the cost-share agreement is between the unit of government and the DNR. Where more than one unit of government contributes runoff to a control practice, the DNR will enter into cost share agreements consistent with an equitable allocation based on municipal contributions to the pollutant loads and storm water volumes being controlled.

c. Practice maintenance is the responsibility of the grant recipient. In some cases, urban storm water pollutants are generated wholly or in part by a unit of government different than that in which the storm water control practice is located.

In these instances, there are several alternatives to properly distribute the financial burden of practice maintenance. Two examples are presented below. In each example, the upstream unit of government generates all or part of the urban pollutant load to the best management practice, which is located in the downstream unit of government.

The downstream unit of government can act as grant recipient, which includes ultimate accountability for practice maintenance. The responsibility could then be delegated, all or in part, to the upstream unit of government through an intergovernmental agreement.

The upstream unit of government can act as the grant recipient, which includes ultimate accountability for practice maintenance. The downstream unit of government could provide, through an intergovernmental agreement, all or part of the local share of the practice installation cost.

6. Participate, with DNR assistance alternative financing / implementation studies which determine the means to pay for administering an urban nonpoint source program in each unit of government. These studies will be conducted on a parallel schedule with the other initial high priority elements undertaken under the segmented program.

7. Submit information to DNR needed for project evaluation.

DNR

The DNR has been statutorily assigned the overall administrative responsibility for the Wisconsin Nonpoint Source Water Pollution Abatement Program. This includes providing financial support for local staff and installation of management practices, assisting local units of government to integrate wildlife and fish management concerns into selection and design of BMPs, and conducting project evaluation activities. The DNR's role in assisting local units of government in carrying out the core and segmented activities are as follows:

DNR Core Program Roles and Responsibilities

1. Assist local governments to enforce construction erosion control provisions developed by the DNR - DILHR Memorandum of Understanding.

2. Review unit of government specific programs of urban "housekeeping" practices for nonpoint source control.

3. Review and approve annual work plans for staff and activities necessary to implement the project.

4. Review and approve annual project implementation reports.

5. Participate in the annual watershed project review meeting.

6. Track changes in urban pollutant loads using information supplied by local units of government.

DNR Segmented Program Roles and Responsibilities

7. Develop a model storm water management ordinance for planned urban development. Assist communities with adoption and enforcement of storm water management ordinances.

8. Assist units of government to develop priorities, schedules and requirements for segmented activities.

9. Review nonpoint source cost-share agreements signed by local units of government with eligible land owners within one week.

10. Enter into nonpoint source cost-share agreements with the eligible lands the local unit of government owns or operates.

11. Review designs of urban nonpoint source BMPs for which cost-share agreements are signed.

12. Reimburse cost share recipients for the eligible costs of installing BMPs at the rates consistent with administrative rules and those established in this plan within four weeks.

Landowners and Land Operators

In many situations, private landowners will install BMPs on their property. Landowners are important participants in the urban implementation activities. Eligible landowners will participate in the project by signing cost-share agreements with local units of government. Maintenance responsibility can be assigned using agreements similar to those discussed above.

County Land Conservation Staff (LCD)

To enhance intergovernmental coordination within the Lowes Creek Watershed project, LCD staff will assist the DNR in implementing the core program by:

1. Designating a primary LCD staff contact to coordinate services with each unit of government.

2. Assigning an LCD staff contact to assist DNR, as requested by the unit of government, to review municipal capital improvement project lists for potential for nonpoint pollution control measures.

3. Providing assistance to local units of government in preparing the information and educational elements for submittal in Local Assistance Grant Agreement applications. Information and education will be consistent with the recommendations identified in the public awareness marketing strategy developed for the Eau Claire County priority watersheds.

4. Reviewing draft construction erosion control ordinances for local units of government within the watershed to ensure effectiveness and consistency with other established ordinances in other units of government.

5. Providing assistance in construction erosion control training programs for local government staff, consultants, developers, contractors and builders

USDA-Soil Conservation Service (SCS)

This agency works through the local land conservation committee to provide technical assistance for planning and installing conservation practices. The district conservationist or other SCS personnel may work with the landowners or units of government to provide assistance with technical work, when assigned by the Land Conservation Division.

University of Wisconsin Extension (UWEX)

Area extension agents will provide support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project. These activities are described in Chapter VI in the information and education strategy.

Best Management Practices (BMPS)

BMPs Eligible For Cost-Sharing And Their Rates

Best management practices are those practices identified in NR 120 determined in this watershed plan to be the most effective in reducing nonpoint sources of pollution. Design and installation of the best management practices previously described under the rural implementation strategy must meet the conditions listed in NR 120. Generally, these practices use standard specifications in the U.S. Soil Conservation Service Field Office Technical Guide.

Specifications for the structural urban practices were described in Chapter IV, "Nonpoint Source Control Needs." Application of these practices will be guided by technical assistance provided by the DNR. Eligible practices and state cost share rates are listed below.

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

Table 5-3. State Cost Share Rates for Urban Best Management Practices.

Best Management Practice	State Cost-share Rate
Critical Area Stabilization[1]	70%
Grade Stabilization Structures	70%
Streambank and Shoreline Stabilization	70%
Shoreline Buffers[1]	70%
Wetland Restoration[1]	70%
Wet Detention Ponds[2]	70%
Infiltration Trenches and Basins[2]	70%
Grass Swales and Waterways[2]	70%
Street Sweeping[3]	50%

[1] Easements may be used in conjunction with these practices.
[2] Applies only to structures for established urban areas--those in existence prior to the date the DNR approves this watershed plan.
[3] This is an alternative best management practice not listed in NR 120 of the Wisconsin Administrative Code.

management activities specifically excluded in NR 120.10 and NR 120.17. The following is a partial list of ineligible activities for cost-sharing in urban areas:

1. Operation and maintenance of cost-shared best management practices (BMPs).
2. Construction erosion control practices.
3. Structural BMPs for new urban development--those whose construction activity commenced after DNR approval of this plan.
4. BMPs installed prior to signing cost-share agreement.
5. Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) Program, including industrial site run-off.
6. On-site septic system controls or maintenance.
7. Dredging activities.
8. Activities and structures intended primarily for flood control.
9. Minimum levels of street sweeping and leaf collection.

Nonpoint Source Grant Agreement and Administration

The Nonpoint Source Grant Agreement is the means for transmitting funds from the DNR to local units of government to provide cost sharing for installation of BMPs. In some cases the municipality will act only as a grantee. In this case, the municipality will use funds obtained under the grant agreement directly for practices it will install, own, and operate.

In other cases, the municipality will play an additional role as a grantor. In these situations, the municipality will pass the cost share funds it has received from the DNR to private landowners who have responsibility for installing, operating, and maintaining the management practices. When this occurs, the municipality will enter into a separate cost-sharing agreement with the private landowner receiving the state funds.

The procedures for administering Nonpoint Source Grant Agreements and Cost Share Agreements parallel those contained in this plan's rural implementation strategy and in NR 120, Wis. Adm. Code.

Cost Share Agreement and Administration

Purpose and Responsibilities

Consistent with s. 144.25, Stats. and NR 120, cost-share funding is available to landowners and local units of government for a percent of the costs of installing BMPs to meet the project objectives. Cost-share agreements must be initiated within three years after formal approval of the watershed plan and are filed as part of the property deed. They may be amended throughout the 8 year project period.

Practices included in cost-share agreements must be installed within the schedule agreed to in 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.

Local, state, or federal permits may be needed prior to installation of some BMPs. The areas most likely to need permits are wetlands and shoreline areas of lakes and streams. These permits are needed whether the activity is a part of the watershed project or not. The cost share recipient is responsible for acquiring the needed permits prior to installation of practices. Local units of government 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.

Identifying Wildlife and Fishery Needs

The local units of government will consult with DNR's Western District wildlife management and fisheries management staff to optimize the wildlife and fish management benefits of nonpoint source control BMPs. Specifically, the DNR will be contacted if:

The DNR staff will assist by:

Identifying stream bank 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.

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 nonpoint source BMPs on wetlands.

Cost Containment Procedures

Cost containment procedures for local units of government are governed by state statute.

Local Assistance Grant Agreement Administration

General Information

The Local Assistance Grant Agreement (LAGA) is a grant from the DNR to local units of government for supporting their staffing and support costs of carrying out the urban implementation strategy. Each local unit of government will have its own agreement. Consistent with NR 120 these grant funds will be used for design, installation and inspection of best management practices on land owned by the local unit of government; additional staff to implement the project; development and enforcement of erosion control and storm water management ordinances; and information and education activities. Other items such as travel, training, and 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).

Activities described in the core and segmented elements of the urban implementation strategy are eligible for financial assistance. The type of eligible activities and the amount of state funds available are described below:

Table 5-4. Urban Implementation Activities Eligible for State Funding.

Activity	Cost Share Rate
Construction site erosion control ordinance amendments	100%
Development of storm water management plans	100%
Engineering studies for existing urban areas and planned urban areas[1]	100%
Design and engineering for structural best management practices[1]	100%
Staff for enforcing construction site erosion control and storm water management ordinances[2]	50%
Additional staff needed for supplementary street sweeping[2]	100%
Development of alternative financing and administration strategies	100%

[1] Funding not available for components dealing exclusively with drainage and flood control.
[2] Funding is limited. Level of staffing based on a work plan submitted by local units of government and approved by the DNR.

Grant Agreement Application Procedures

An annual review of the Local Assistance Grant Agreement is conducted through development of an annual work plan by the local unit of government. This plan estimates the work needed to be accomplished each year. The work plan is provided to the DNR for review and clarification. Along with the work plan, 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

Local units of government are required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Lowes 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 from each local unit of government 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.

Urban Budget and Staffing Needs

The urban program budget and staffing requirements include several key components. These are presented below, along with estimates of budget and staffing needs.

Engineering Feasibility Studies

Engineering feasibility studies will be needed for existing and planned urban development in order to determine the type, size and location of BMPs. Most of these studies will probably be carried out by the private sector, with most of the cost borne by the DNR. The estimated costs of preparing these feasibility studies for each community are presented in Table 5-6. In making these estimates, a planning cost of $100/acre was estimated.

Detailed Engineering Designs

Once BMP feasibility studies are completed, detailed designs must be prepared. These designs will probably be prepared partly by the private sector and partly by staffs of local governments. The cost of site designs for structural practices located in existing and planned urban areas is included in cost estimates presented in the following sections and in Tables 5-6 and 5-7. It has been assumed that designs are prepared by the private sector and funded 100 percent by the DNR.

Alternative Funding Sources

A substantial portion of the estimated costs of implementing this plan's urban management recommendations is for the construction of storm water management practices in existing urban areas to control pollutants discharged by a wide variety of activities. Where urban structural practices are used to control storm water pollutants, state cost sharing is limited and the burden falls heavily on local funding sources.

Some municipalities have endorsed a concept of distributing the cost of pollution control by developing a mechanism to charge those responsible for discharging the pollutants. In addition, municipalities have indicated a desire to pursue additional state or federal funding sources.

One way to distribute costs is to assess the sources of each storm water pollutant. This requires the identification of sources responsible for pollutant discharges. This plan endorses investigations that identify specific sources of urban storm water pollutants. If storm water pollutant dischargers cannot take actions to reduce runoff pollutants, they can be charged a portion of the local share of the cost of the BMP that would be installed by a downstream landowner or local unit of government.

State or federal programs could be developed to help distribute the cost of pollution control. This could be done by collecting storm water pollution discharge fees and redistributing these funds to local units of government. Such fees could be associated with the production or use of polluting materials. Current examples include the state's tire tax which is collected on every tire sale to finance long-term tire disposal. Alternatively, costs could be distributed by assessing local charges within the urban area based on the amount of polluted runoff discharged. Current examples include utility districts and basin authorities being used throughout the country to finance storm water management practices.

This plan endorses continuing investigation into source control alternatives as well as development of alternatives for distributing local pollution control costs. Some of these alternatives, such as the collection and redistribution of fees at the state level and increased state funding for urban nonpoint source control practices should be investigated through further Legislative Council Study on Nonpoint Source Pollution Control. Other alternatives, such as the creation of local utility districts should be investigated by respective municipalities.

Cost of Installing Structural Practices in Existing Urban Areas

Factors that affect the cost of constructing BMPs to control pollutants in existing urban runoff include:

labor rates,
land costs,
cost of relocating residences,
excavation costs, and
cost of rerouting storm sewers.

These costs vary from case to case. Land and labor costs will vary by governmental unit. In rare cases, residences and businesses in densely urbanized areas may be removed or relocated to allow space for BMPs. Excavation costs for underground structures, such as detention below parking lots or buildings, are several times greater than for surface structures. Finally, rerouting storm sewers to retrofitted BMPs can be costly.

Table 5-6 presents cost estimates for street sweeping and other non structural practices in existing urban areas. It assumes street sweeping will be implemented for all land uses within the watershed. The total cost for installing this BMP in urbanized areas is approximately $900,000.

Some local governments have indicated they are unable to fund some components of these costs. Therefore, this plan recognizes that additional funding through other initiatives must be provided to meet project goals.

Cost of Installing Structural Practices on Planned Urban Areas

Table 5-7 presents an estimate of the cost for wet detention / infiltration in planned urban areas. In developing areas, storm water planning can assure that adequate land is set aside, and storm water practices are incorporated into the conveyance systems.

Table 5-7 shows that an estimated $600,000-900,000 will be required to design and install wet detention / infiltration in urban areas. Any land costs would be additional. The entire cost would be borne locally, as Nonpoint Source Program funds are not used for practices in areas of new development.

Operation and Maintenance for Structural Practices

Operation and maintenance costs for detention are about 5 percent of the capital construction cost per year. This cost must be borne locally.

Total Costs of BMPs in Existing Urban Areas

Tables 5-6 and 5-7 show the estimated cost of recommended levels of wet detention, including street sweeping for 50 percent of the critical urban land uses as part of a program that phases in detention. The costs presented in the table assume a total cost of $25 per curb mile for street sweeping. The total annual cost of treating existing urban areas with BMPs recommended in this plan is approximately $3.5 million over the life of the project. The state share would be approximately $846,393 and the annual local share about $2.5-2.8 million.

After five years, local units of government would need to maintain the supplementary levels of street sweeping at their own expense as the Nonpoint Source Program funding is limited to a five-year period. As wet detention or other practices providing equivalent control are installed, the supplementary sweeping could be discontinued.

Cost of Preparing Construction Site Erosion Control Plans

This cost has not been estimated. It will be borne primarily by the private sector to meet requirements of local ordinances, state building codes and storm water permits.

Cost of Installing Construction Erosion Control Practices

It is assumed that construction site practices will average $250 per acre. Using this unit cost, it will require an estimated $1,042,250 to install construction site erosion control practices in the watershed. All of this cost will be borne locally by the private sector to meet requirements of local ordinances, state building codes, and state storm water permits.

Cost of Amending and Enforcing Construction Erosion Control Ordinances

Funding is available on a limited basis to support total costs minus collected fees up to one-half the total. Within five years, it is expected that the local government will charge fees adequate to support the total cost of the enforcement program. Five additional staff-years are needed to administer and enforce water quality related ordinances.

Cost of Enforcing Storm Water Management Ordinances

Likewise, the cost of additional staff for enforcing storm water management ordinances will be funded 50 percent by the DNR for the first five years. Permit fees should be structured so that continued funding is planned.

Cost Share Budget

Costs of Installing BMPs

The quantity and type of management practices that are required to meet water quality objectives of this project are listed in tables 5-5, 5-6, 5-7. The capital cost of installing the BMPs are listed in this table assuming rural landowner participation rates at 75%, and urban rates at 100%. Also included are units of measurement and cost share amount per unit for the various BMPs.

The capital cost of installing the rural Best Management Practices in Eau Claire County is approximately $208,818 assuming 75% participation.

* State funds necessary to cost-share this level of control would be about $136,325 for Eau Claire County.

* The County of Eau Claire will contribute 10% toward the installation of BMPs cost-shared by State funds, this will amount to $13,632.

* The local share provided by landowners and other cost-share recipients would be about $14,000.

The capital cost of installing the urban Best Management Practices is approximately $3.7 million, with the state share being $864,393 and the local share being approximately $2.8 million

State costs will total approximately $1.1 million
Local costs will total approximately $2.8 million
Total costs for both rural and urban aspects is approximately $3.9 million.

Cost Containment

Cost Containment Procedures

Chapter NR 120 requires that cost containment procedures be identified in this plan. The cost containment procedures to be used by Eau Claire County are described below.

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 to the grantee may be increased with the approval of the Eau Claire County Land Conservation Committee. Appropriate documentation regarding the need for changes will be submitted to the DNR.

Bids

Competitive bids will be required in Eau Claire County for all structural BMPs with estimated total costs, as determined by the project technician, exceeding $5000. The bidding process requires the county to receive a minimum of two bids from qualified contractors in lump sum bid. The cost share recipient must provide copies of the bids to the county prior to initiating construction. In cases where the cost share recipient provides proof that bids were requested from a minimum of three qualified contractors but only one bid was received, the county will determine if the bid constitutes an appropriate cost for the project. If no bids are received or if the lone bid is not deemed appropriate, Eau Claire county will limit cost sharing based on average costs.

Table 5-5. Total Estimated Rural Costs for Project Period (8 Years) Lowes Creek Priority Watershed

BMP	Number	Local Cost[1]	State Cost[2]	Cost
Critical Area	3	$300	$2,100	$2,400
Grass Waterway	5	$600	$2,400	$3,000
Grade Stabilization	1	$2,160	$8,640	$10,800
Barnyard Runoff	1	$2,880	$11,520	$14,400
Streambank Erosion Control:				
Shape and Seed (ft)	1,000	$2,700	$10,800	$13,500
RipRap(ft)	3,000	$21,600	$86,000	$108,000
Well Abandonment	20	$25,265	$101,060	$126,325
TOTAL		**$55,685**	**$222,340**	**$278,425**

[1] Eau Claire County is contributing 10% to BMP costs
[2] DNR contributes 70-80% to BMP Costs

Table 5-6. Total Estimated Urban Costs for Project Period (8 years) Lowes Creek Priority Watershed

Item	State Cost Share Rate	Local Cost	State Cost	Total Cost
Stormwater Planning $100/acre	70%	$186,090	$434,210	$620,300
Construction Site Erosion Control $250/acre	0%	$1,042,250	$0	$1,042,250
Construction Site Erosion Control Staff 1/2 staff - $20,000 /year	100% (for first 5 years, remaining 3 years at 0%)	$60,000	$100,000	$160,000
Increased Lawn and Leaf Pickup $7,500 year	50%	$30,000	$30,000	$60,000
Street Sweeping 27 passes a year $25 curb mile	50% (for first 5 years, remaining 3 years at 0%)	$621,038	$282,290	$903,328
BMPS on Newly Developing Areas See Table 5-4	0%	$600,000-$900,000	$0	$600,000-$900,000
Information and Education See Appendix B	100%		$47,893	
TOTAL		$2,539,378-$2,839,378	$846,393	$3,433,771-$3,732,771

Table 5-7. Estimated Size and Cost for Planned Land Uses and Infiltration Basins Within the Lowes Creek Watershed Under Management Action 5 - Protection of Sensitive Streams Wetted Bottom Surface Area of Basin (acres)

Subwatershed	Option 1 - No changes in planned land use	Option 2 - change planned med. res. to low res .	Option 3 - change planned med. res. to low res + no com dev.	Option 4 - change planned med. res. to low res. + no com. or multi-fam. dev.
Timber Creek	0.25	0.1	0.1	0.1
State Street	0.5	0.3	0.3	0.3
Non-Sewerd West	5	4.5	4.5	4.5
Non-Sewerd East	2.1	1.75	1	1
Lowes Creek South	0.1	0.1	0.1	0.1
Lowes Creek North	1.5	1.1	0.75	0.3
Vance / Carter	1.8	1.7		
Bittersweet	0.9	0.4	0.4	0.4
TOTAL AREA	12.15	9.95	7.15	6.7

Table 5-7. (Cont.)

Costs for Construction of Basins				
Timber Creek	$24,000	$20,000	$20,000	$20,000
State Street	$42,000	$25,000	$25,000	$25,000
Non-Sewerd West	$450,000	$425,000	$425,000	$425,000
Non-Sewerd East	$110,000	$100,000	$71,000	$71,000
Lowes Creek South	20,000	$20,000	$20,000	$20,000
Lowes Creek North	$90,000	$75,000	$50,000	$26,000
Vance / Carter	$105,000	$100,000	-	-
Bittersweet	$68,000	$32,000	$32,000	$32,000
TOTAL COST	$909,000	$797,000	$643,000	$619,000

Design Criteria for Infiltration basins:
3 foot depth; 3:1 side slopes
Area cleared is 2x basin area
Area grubbed is equal to 0.5 x basin area (for spillway and embankment)
Volume excavated equals basin volume plus 5% for spillway, inlet, outlet , etc.
Volume of fill placed and compacted equals 0.67 x excavation volume
Seeded area = (area cleared - basin area) x 0.9
Area sodded = (area cleared - basin area) x 0.1
Riprap volume = basins area x 0.02 x 0.5 yard thick
area landscaped = basin area

Costs are based on the year 1992
Costs only included the construction of the basin
land purchase, piping, easements, etc. are not included in this figure

Average Costs

Average costs will be used in Eau Claire County for all structural BMPs with an estimated cost equal to or less than $5000 and for all non-structural BMPs not using a flat rate, unless the cost share recipient decides, and the county agrees, to bid the installation of the BMPs.

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.

Flat Rates

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 Eau Claire 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 Eau Claire 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 under the project. As this account is drawn down, the county will request reimbursements from the DNR to replenish the account. The counties will submit reimbursement requests on a quarterly basis. This reimbursement schedule will insure that the "up front" account balance is maintained at an adequate level. The 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 Lowes 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 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 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. 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). 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 Division office 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.

Eau Claire County is responsible for enforcing compliance of cost-share agreements to which they are party. Where the 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. Eau Claire 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 during the implementation or monitoring phase of the project.

Landowner Contact Strategy

The following procedure will be used to make landowner contacts.

a. During the first year 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.

b. 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 during the cost share period.

c. 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.

d. The county will contact all eligible landowners (as defined in C. 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 and 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.

a. Landowner and county staff meet to discuss the watershed project, NPS control practice needs, and coordination with conservation compliance provisions is applicable.

b. Landowner agrees to participate with the watershed project.

c. A farm conservation plan is prepared by the county, if needed.

d. 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.

e. Practices are designed by the county or designee, and a copy of the design is provided to the landowner.

f. The County obtains 2 or more bids or other information required in the cost containment policy.

g. Amendments to the CSA are made if necessary.

h. The county staff oversee practice installation

i. The county verifies the installation.

j. The landowner submits bills and proof of payment (canceled checks or receipts marked paid) to the county.

k. Land Conservation Committee or the designated representative and if required, county boards, approve cost-share payments to landowners.

l. Checks are issued by the county to the respective landowners and project ledgers are updated.

m. The county records the check amount, number, and date.

n. DNR reimburses the county for expended cost-share funds.

Identifying Wildlife and Fishery Needs

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

The DNR staff will assist county staff by:

a. Identifying streambank protection practices that benefit fish and wildlife.

b. Identifying wildlife habitat components that could be incorporated into vegetative filter strips along streams or in uplands.

c. Recommending wildlife habitat components and reviewing placement of agricultural sediment basins to assure that negative impacts on fish and aquatic life do not occur.

d. 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.

e. Helping to resolve questions concerning effects of agricultural nonpoint source BMPs on wetlands.

Submittal to the DNR

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

a. where cost-share funds are to be used for practices on land owned or controlled by the county.

b. for agreements or amendments where the cost-share amount for all practices for a landowner exceeds $50,000 in state funds.

c. 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.

d. 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 to be subjected to this approval procedure.

e. for animal lot relocation.

f. 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 Eau Claire county for support of staff and support costs to carry out this watershed plan. Consistent with NR 120, Eau Claire county will use funds from the LAGA for additional staff to implement the project and conduct information and educational activities. Other items such as travel, training, and certain office supplies are also supported by the LAGA. Further clarification of eligible costs supported be 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 analysis estimates the work needed to be accomplished each year. The workload is provided to the DATCP and the 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

Eau Claire county is required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Lowes Creek Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of the 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 the DATCP from each 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. These estimates are based on needs identified for Eau Claire County.

Staff Needs

Table 5-8 lists the total estimated staff needed to implement the Lowes Creek Watershed Project. Figures are provided for 75% levels of participation. A total of about 8,872 staff hours are needed to implement this plan at 75% landowner participation. This includes 506 staff hours to carry out the information and education program.

The Land Conservation Division in Eau Claire County will employ 0.6 project staff during the first year of the project. Eau Claire county will assess the number and type of staff required for the remainder of the project based on the experience gained during the first year of implementation.

Table 5-8. Estimated county LCD staff needs for project implementation

Activity	Project Years	75% Landowner participation (staff hours)
Project and Fiscal Management	1-8	1,221
Information and Education	1-8	859
Pre- Contact	1-3	321
Conservation Plans/ CSA	1-3	765
Revisions and Monitoring	1-8	325
Design and Installation	1-8	4,493
Training	1-8	858
Total LCD workload		8,872

Estimated staff required years 1-3 0.6 / year
Estimated staff required years 4-8 0.5 / year

Table 5-9. Total Project Costs at 75% Participation

Cost-Share - Practices	$135,000
L.A. Staff Support	$160,000
Information and Education	$47,000
Other	$22,000
Engineering Assistance	$40,800
TOTAL	$405,000

Staffing Costs

The estimated cost for staff at this landowner participation rate (see table 5-9) is approximately $160,000 in Eau Claire County. All of these costs, with the exception of some direct cost items, would be paid for by the state.

Schedules

Grant Disbursement and Project Management Schedule

Implementation may begin upon approval of this watershed plan by the Eau Claire County Board; DATCP; and the DNR. 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 agreements must be installed within a five year period.

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 the DNR and the DATCP.

The disbursement of the grants (Local Assistance and Nonpoint Source) to Eau Claire county will be based on an annual workload analysis and grant application process. The estimated grant disbursement schedule based on 75% participation by eligible landowners can be found in Table 5-9.

Total Project Cost: The total state funding required to meet the rural nonpoint source pollution control needs at 75% level of landowner participation is presented in Table 5-9. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated cost to the state would be $405,000 in Eau Claire county.

Involvement of Other Programs

Coordination With State and Federal Conservation Compliance Programs

The Lowes Creek Watershed project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by the DATCP, and the Federal Food Security Act (FSA) administered by the Soil Conservation Service. The DATCP will assist Eau Claire county and the SCS office to identify landowners within the watershed that are subject to the compliance provisions of FPP and FSA.

There will be a need to implement the conservation plans, and in the future, amend these plans during the implementation phase of the watershed project. Watershed project supported staff will revise the conservation plans developed for FPP, and will inform SCS of cost share agreements and the installation of 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.

Some eroding uplands in management categories 1 and 2 may need control, in addition to that required for meeting sediment delivery 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.

Information & Education Program

Program Objective

The objective of the Information and Education (I&E) Program is that of assisting the Lowes Creek Watershed Project in reaching its overall objective of protecting the Class II trout fishery in Lowes Creek from further degradation.

To reach this objective, the I&E Program is structured around key messages which focus on the Project's pollutant load reduction goals of: 1) preventing future increases in thermal discharges, 2) reducing sediment loading from urban and rural sources, 3) reducing metal loading, and 4) preventing future increases in peak stormwater flow conditions.

The I&E Program is designed to reach a multi-faceted audience through a wide array of activities. Delivery of the I&E Program will be accomplished through the cooperative effort of citizen interest groups, schools, business associations, and city, county and state agency staff.

Program Messages

I&E activities will be structured around the following messages:

1. Future welfare of Lowes Creek is in the balance: Lowes Creek is a valuable resource whose future welfare will be effected by increasing urbanization of its watershed. Protection of Lowes Creek at this time will provide the Eau Claire community with recreational and educational opportunities for generations to come.

2. The problems of nonpoint source water pollution are shared, as are its solutions: All of us, individual citizens, businesses and government, contribute to some degree to nonpoint source water pollution. Accordingly, we all can, and should, play a role in nonpoint source water pollution prevention.

3. Protection of Lowes Creek will require a significant commitment of resources: Accomplishing project objectives will require significant investment of time and money by government, businesses and individual citizens.

4. Urban and suburban portions of the Lowes Creek watershed are primary contributors to the pollution problems facing the Creek: Although adverse agricultural and rural non-farm impacts been identified, Lowes Creek's water quality problems largely originate from urbanized areas.

5. Stormwater management is key to the protection of Lowes Creek: Increases in impervious area within the Lowes Creek watershed, e.g., roads and roofs, can negatively impact Lowes Creek by increasing the volume, temperature and delivery rate of surface water runoff. Protection of Lowes Creek from these impacts will require the application of extensive stormwater management practices on future land development.

6. Storm sewers discharge directly into surface waters: Storm sewers deliver runoff water to Lowes Creek, making it important that runoff from our yards, streets and business is kept free of contamination. Property owners should practice proper use of fertilizers and pesticides, and proper handling of yard wastes. The city and town should maintain regular street cleaning programs. Businesses should examine their operations for practices that contaminates stormwater runoff. In no case should storm sewer drains be used for waste disposal.

7. Construction site erosion is a cause of sedimentation in Lowes Creek: Sedimentation results in the loss of in-stream habitat by filling in pools and covering over ripple areas. Because storm water drainage systems can deliver soil eroded from sites some distance from Lowes Creek, control of construction site erosion is important in all areas of the watershed, and not just in those areas adjacent to the creek itself.

8. Improved streambank management is required for Lowes Creek protection: In-stream and streambank habitat can be protected and enhanced through streambank erosion control, establishment of stream buffers, and streambank easements. Establishment of streambank trails and stream access points will enhance use and enjoyment of Lowes Creek by the public.

9. Concentration of copper, lead, and zinc in runoff from urban portions of the Lowes Creek watershed exceeds state water quality standards: High levels of "heavy metals" are a threat to aquatic life. Control of heavy metal runoff is important, and is planned to be accomplished through stormwater management practices, improved housekeeping of industrial and transportation sites, and elimination of zinc coated metal for use in roofing.

10. The Lowes Creek Watershed Project joins other regional efforts that are benefiting the Chippewa River: Along with the Lower Eau Claire River Watershed Project and the Duncan Creek Watershed Project, the Lowes Creek Watershed Project will improve water quality in the Chippewa River through the control of nonpoint sources of pollution.

Listed in Appendix B are the detailed information and education activities and costs listed by year.

Target Audiences

Target audiences for the I&E Program can be divided into two groups, those who will need to take action if Lowes Creek Watershed Project goals are to be met, and those who can be supportive of such action.

Those whose action is needed	**Those who can support action**
Rural landowners/renters	Youth (schools, scouts, 4-H)
Urban landowners/renters	Engineering firms
Commercial businesses	Conservation organizations
Eau Claire County	Outdoor rec. organizations
Town of Washington	Civic organizations
City of Eau Claire	Business organizations
Builders and contractors	Media

Mediums for Message Delivery

Newspapers	**Television**	**Radio**
Leader-Telegram	Ch. 13	WAXX
Family Times	Ch. 18	WAYY
Country Today	Ch. 28	WEAQ
Chip Valley Explorer	Ch. 48	WHWC
	Public Access	WMEQ
		WOGO
Newsletters	**Magazines**	WUEC
		WWIB
Beaver Creek Reserve	Western Wisconsin	WBIZ
Town of Washington		WECL
Sierra Club		WEUZ
UWEX Green Pages		WIAL
UWEX Ag Newsletters		WISM
UWEX Family Living		
Chip. Valley Builders		
E.C.'s Community News		

Mailings

Direct mail
Enclosures with township
and city mailings

Businesses

Garden centers
Lawn Care Services
Tree Care Services
Contractors
Engineering firms
NSP
Veterinarians

Government

City Public Works
Township Gov't.
Co. Coop. Extension
Co. Land Conservation
Co. Parks and Forest
Co. Planning and Dev.
Co. Public Works & Trans.
State - DILHR
State - DNR
State - DOT

Public Schools

Little Red Elementary
Manz Elementary
Meadowview Elementary
Robbins Elementary
Putnam Heights Elementary
South Middle School
Memorial High School

Private Schools

St. Patrick Elementary
Immaculate Concep. Ele.
St. Mark Elementary
Eau Claire Luth. Elementary
Immanuel Lutheran HS
Regis High School

Youth

Boy Scouts
Girl Scouts
4-H

Service organizations

Extension Homemakers
Jaycees
Kiwanis Club
League of Woman Voters
Lions Club
Newcomers Club
Optimist Club
Rotary Club

Outdoor/Environmental org.

Bird Watchers
Chippewa Wildlife Soc.
Clearwater Greens
Committee for Chippewa River Improvement
Lower Chippewa Restoration Coalition
Lowes Creek Watershed Assoc.
Rod and Gun Club
Sierra Club
Trout Unlimited

Chip Valley Watershed Proj.

Duncan Creek Watershed Proj.
Lower Eau Claire Watershed Project

CHAPTER SIX
Integrated Resource Management

The purpose of this chapter is to define the principles and guidelines for making sure that the watershed project is coordinated with other DNR resource management programs and activities. Each activity is described below:

Fisheries

The DNR has actively studied ways to improve the trout fishery in this watershed. Watershed practices, such as streambank protection, shoreline buffer strips, and easements should be implemented in such a way that it will enhance the fishery management goals. Specifically, all streambank protection BMPs, wherever possible, will be installed in such a way that the fisheries habitat is enhanced. Rock riprap will be installed so that the placement and size of the rock will positively benefit trout habitat. The fishery manager will be consulted in the design of each streambank protection BMP.

Riparian Zones

Where possible, riparian zones along Lowes Creek should be protected. These areas can be acquired through easements so that they will receive lasting protection. These areas are important wildlife habitats.

Stewardship Program

Through the Priority Watershed process, Lowes Creek was selected and approved as a stewardship stream. Stewardship status makes a number cost-sharing activities available for the water resource. With this status, items not eligible for nonpoint source cost share dollars may be eligible for stewardship dollars; for example, moneys can be used to build upon existing park systems, or acquire sensitive or endangered habitat with in the stream corridors.

Forest Resources

The DNR Western District Urban Forester will assist the Eau Claire County LCD in preparing a newsletter article for the watershed project that explains the opportunities in urban forestry for the Lowes Creek area. The Urban Forester will contribute an article in 1993 to be included in one of the watershed newsletters for that year.

CHAPTER SEVEN
Progress Assessments

Introduction

This chapter describes how progress will be monitored in the Lowes Creek Watershed Project. The strategy contains two components:

1. administrative review
2. pollution reduction evaluation

Information on these components will be collected by the county Land Conservation Department (LCD) and reported to DNR and 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 DNR's Bureau of Community Assistance. Tracking of pollutant loads for urban management will be accomplished using the DNR models for urban areas. The Bureau of Water Resources is responsible for developing techniques and tracking changes in pollutant loads in the urban and developing areas of the project.

Each year during project implementation the County LCD, DNR, and the City of Eau Claire will conduct an annual meeting. The County reports and other available information will be collected to make an evaluation of the progress and status of the project. The purpose of this meeting is to review project success and measure the watershed project goals against the accomplishments recorded for that year.

Administrative Review

This component will focus on the progress of the county in implementing the project. The project will be evaluated with respect to 1) amount and types of BMPs on Cost Share Agreements and installed (accomplishment reporting), 2) financial expenditures and 3) staff time spent on project activities.

Accomplishment Reporting

Data on administrative accomplishments will be collected by the LCD and will be provided to DNR and DATCP for program evaluation.

The County LCD will provide the following data to DNR and DATCP on an annual basis:

1. number of personal contacts made with landowners,
2. completed I & E activities,
3. number of farm conservation plans prepared for the project,
4. number of cost share agreements signed,
5. number of farm conservation plan and cost share agreement status reviews completed, and
6. number of farms and acres of cropland checked for proper maintenance of Best Management Practices.

In addition to annual reports, County LCD and Eau Claire City representatives will meet with DNR and DATCP staff annually to review progress and plan for the next year.

Financial Expenditures

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

1. number of landowner cost share agreements signed,
2. amount of money committed on cost share agreements,
3. number of landowner reimbursements made, and amount paid for BMP installation;
4. expenditures for staff travel,
5. expenditures for information and education program,
6. expenditures for equipment, materials and supplies,
7. expenditures for professional services and staff support costs,
8. total project expenditures for LCD staff,
9. staff training expenditures,
10. interest in money earned and expended, and

Time Spent on Project Activities The LCD will provide time summaries to both departments for the following activities on a quarterly basis:

1. project and fiscal management,
2. clerical assistance,
3. pre-design and conservation planning activities,
4. technical assistance: practice design, installation cost share agreement status review, and monitoring,
5. educational activities,
6. training activities, and
7. leave time.

Pollutant Reduction Evaluation

Purpose

The purpose of this evaluation component is to calculate reductions in the amount of key pollutants as a result of installing Best Management Practices. Four key sources have been identified for estimating changes in pollutant loads in the Lowes Creek Watershed: a) urban runoff b) runoff from barnyards c) gully erosion, and d) streambank erosion. Tracking procedures for each source is described below.

Procedure

1. Urban Runoff

A. Evaluation of urban activities require reporting for two categories of progress. Those activities related to "core" program actions will cover the following items and should be reported annually by the local units of government that plan and implement the activities;

1. Information and education activities
2. Ordinance development and administration
3. Number of erosion control plans developed
4. Management actions taken to reduce pollutant loading

B. Implementation and planning of structural best management practices also requires annual reporting. These site specific activities can be reported in the following categories;

1. The acres of land under development with plans for controlling urban pollutants and stormwater flows.
2. Type and amount of individual structural practices planned.
3. Type and amount of individual structural practices installed.

C. Site specific pollutant loading reductions accomplished by BMPs will be reported by the unit of government that funds a practice. Pollutant load reductions associated with land development by private landowners must also be reported by the appropriate unit of local government. Forms and methods of reporting the pollutant load reductions will be developed in the grant process with the local units of government.

2. **Barnyard Runoff**

The county will provide an estimate.

3. **Gully Erosion**

The county will record for each landowner, the actual number of gullies present at the time of cost share agreement and the number of gullies to be controlled through BMPs identified on the Cost Share Agreement. An estimate of the tonnage controlled by the practice is required for tracking.

4. **Streambanks**

The county LCD will calculate changes in streambank sediment in terms of tons of sediment. A tally will be kept of landowners contacted, the amount (tons) of streambank erosion being generated at the time of contact, the length (feet) of streambank to be controlled by Best Management Practices and changes in erosion levels estimated after installing Best Management Practices.

The County LCD may also consider the use of a tracking system that reports reductions in pollutant quantities on a form. The form is presently available from DNR or another type of form could be developed by the County and DNR that meets the same requirements for reporting pollutant load reductions by quantity. The purpose of the tracking system is to record the existing condition of pollutant loading and also record the changed condition after planning the implementation of best management practices.

5. **Easements**

The planning and use of easements in this project is another activity that will require some tracking and record keeping. The County LCD and the DNR will develop a system of tracking easements that report the following kinds of information annually;

Landowner name
Location of the proposed easement
Current status of the activity

The pollutant loading associated with proposed streambank or riparian easements will not be measurable unless inventoried sources have been documented at the site. The use of easements is more related to protection activities than actual pollutant loading reductions. The DNR will furnish a checklist to the County for the purpose of recording easement acquisitions. The checklist can function as a tracking method and is capable of reporting a range of appropriate information.

APPENDIX A
Lowes Creek Demonstration Project

Lowes Creek Demonstration Project

The demonstration site is a 175 acre parcel being developed for commercial use. It is a highly visible site located at the junction of Interstate Highway 94 and State Highway 93 on the southside of the City of Eau Claire. Sandy soils cover most of the site. Development of the site is expected to be completed in the next three to four years. The first property to be developed is the Ken Vance car dealership. The demonstration site will go from a predevelopment imperviousness of 10% to a post development imperviousness of 80%.

Three levels of control take place upon the site. The first level is pollution prevention. This effort has lead to using different building materials to reduce the source of pollutants. An example of this effort is the use of non-galvanized roofing materials used upon the Ken Vance Building. Zinc loadings are expected to be reduced by this practice.

The second level of control is on-site BMPs. This level of control requires the building practices for control of pollutants upon the site. These BMPs are usually scaled down versions of a standard BMPs built on larger sites. Hopefully, these BMPs can be incorporated into the site design before the project starts construction. An example of this type of system is the infiltration islands that have been built upon the Ken Vance site. These infiltration islands are designed to reduce the amount of flow generated from the parking lot. They have an inlet and outlet that allows water to flow over a rock/sand material. The islands are also used as traffic barriers that would be typically found in commercial parking areas. Approximately half of the islands were used as infiltration devices. It is estimated that these devices will reduce total site flow 10-15%.

The third level of control is the regional facility approach. This is the most common approach for control of stormwater. This type of approach evolves around a lager control facility built at the end of a drainage system. For the demonstration site, a regional wet pond/infiltration facility is the final level of control for the 175 acre site. A wet pond is used for the primary treatment, with an infiltration basin used for secondary treatment of stormwater. Special design criteria were selected for the wet detention pond located in front of the infiltration basin. Temperature control has been built into the design. The use of wet detention basin on trout streams has been discouraged because the trout are stressed by the warm water discharge from the pond. A north-south orientation of the pond and shading from properly located plantings will minimize the temperature increase in the pond. Since the water from the pond will discharge directly into the infiltration basin, temperature concerns should be mitigated. The wet pond will also be used to extend the life of the infiltration basin as the heavier solids will be controlled by the wet pond

Design of on-site and regional facilities was aided by the SLAMM and P8 models.

APPENDIX B
Information and Education Activities (by Calendar year)

Planned Information and Education Activities (by Calendar Year)

Year 1: 1993 (Project anticipated to start mid-year)

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media: Project will establish and maintain relationship with the local press for the purpose of gaining regular and timely exposure of the Project's purpose and activities. Story ideas and articles will be sought from all Project staff and advisory members. Jean Schomisch, LCD, will provide coordination and serve as the media point contact.	2 articles/0.5 year	Watershed residents Local gov't officials General public	City - 2 hrs DNR - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Television media: Project will establish and maintain relationship with local television for the purpose of gaining regular and timely exposure of the Project's purpose and activities. Story ideas will be sought from all Project staff and advisory members. Jean Schomisch, LCD, will provide coordination and serve as the media point contact.	1 segments/0.5 year	Watershed residents Local gov't officials General public	City - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

Radio media: Project will establish and maintain relationship with area radio stations for the purpose of gaining regular and timely exposure of the Project's purpose and activities. Jean Schomisch, LCD, will provide coordination and serve as the media point contact.	2 segments/0.5 year	Watershed residents Local gov't officials General public	LCD - 2 hrs UWEX/C - 2 hrs	No direct costs
Project newsletter/Direct mail: Quarterly mailings focusing on Project purpose and activities. Jean Schomisch, LCD, will serve as editor. Circulation of 2,000.	General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 12 hrs UWEC/C - 12 hrs UWEC/A - 12 hrs	Printing - $ 1,500 Postage - 1,125 Photo work - 115 TOTAL - $ 2,740
Survey of watershed residents: Designed to determine water quality attitudes and understanding, current land use practices, and favored sources of information. Delivered pre-project in 1993, and mid-project in 1998.	10/93 10/98	Project staff Watershed residents	LCD - 8 hrs NPM - 8 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	$ 200
Presentations to groups: Project staff will seek opportunities to speak to groups active in the watershed. A slide set will be developed to assist in giving presentations (see below).	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100
Project slide set: A slide set will be developed to assist staff in giving presentations to groups.	93	Watershed residents Local gov't officials Interest groups	LCD - 16 hrs UWEX/A - 16 hrs	Slides & graphics - $150

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Display project exhibit board: Project exhibit board will be displayed in public places throughout watershed, e.g., banks, health clinics, golf course, schools, etc. Up-date exhibit as needed.	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications: UWEX yard care and yard waste management publications will be distributed via retail outlets and yard care services. Ten sites anticipated.	On - going	Homeowners	M/Gardener - 35 hrs UWEX/C - 16 hrs	Display racks - $ 1,450
Composting demonstration: Composting demonstration at Fairfax Pool site will be maintained and featured in educational programming.	As long as city site is available	Homeowners	M/Gardener - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling: Recruit and facilitate the stenciling of "Dump no waste - Drains to stream" messages on watershed storm drain inlets. Organized as a youth project. Full media coverage of activity will be sought.	As groups volunteer	Urban residents	City - 24 hrs	Paint & supplies - $ 350
Consulting with stream frontage property owners: Project staff will make individual visits to property owners on Lowes Creek to provide information on streambank erosion control, habitat enhancement, stream access, and easements.	1993 - 95	Streambank landowners	LCD - Hrs. already accounted for	No direct costs

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Consulting with architects and engineers: In meeting with firms involved in planning new development, City/County planning staff will highlight water quality aspects of storm water management and describe possible project cost-sharing for retro-fitted storm water management practices.	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
ANNUAL TOTALS			City - 48 hrs DNR - 18 hrs LCD - 62 hrs M/Gardeners - 75 hrs NPM - 8 hrs UWEX/C - 58 hrs UWEX/A - 36 hrs	$ 5,140

Year 2: 1994

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	4 articles/year	Watershed residents Local gov't officials General public	City - 4 hrs DNR - 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs

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Television media:	2 segments/year	Watershed residents Local gov't officials General public	City 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs
Radio media:	4 segments/year	Watershed residents Local gov't officials General public	LCD - 4 hrs UWEX/C - 4 hrs	No direct costs
Public Service Announcements (PSAs) for radio: Seasonal PSAs focusing on yard care and "housekeeping" issues will be produced by the Project. Examples: "Don't dump waste down drains", "Fertilize your lawn not the creek", "Be a clipping composter", "Don't drive a dripper".	3/94	Homeowners Multi-family units Golf courses Businesses School district	City - 4 hrs UWEX/C - 12 hrs UWEX/A - 12 hrs	Production costs - $ 125
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,060 Postage - 1,545 Photo work - 155 TOTAL - $ 3,760
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100

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Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Yard care / Yard waste management exhibit at Chippewa Valley Home and Garden Show.	3/94	Homeowners	City - 8 hrs M/Garden - 16 hrs UWEX/C - 24 hrs	$ 300
Soil fertility survey: A statistically significant number of lawns (est. 50) will be soil tested within the watershed to determine trends in soil fertility levels. Survey results will be shared in Project mailings and media releases during 1995.	10/94	Homeowners Yard care services Yard and garden centers	City - 4 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	Soil lab fees - $ 350 Field labor - 250 TOTAL - $ 600
Composting demonstration:	As long as city provides site	Homeowners	M/Garden - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Stormwater management demonstration: The Hway 93/94 demo site will be utilized for field days and media coverage.	Local field day - 5/94 Regional f/day - 5/94 School f/day - 5/94	Local gov't officials City/County staff Engineering firms Contractors Interested public Students	City - 12 hrs DNR - 12 hrs LCD - 12 hrs UWEX/C - 6 hrs UWEX/A - 6 hrs	Field days - $ 400

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Construction site erosion control workshops: Held in conjunction with the Chippewa Valley Builders Association to provide updates on erosion control methods and to introduce city and county erosion control ordinances if implemented.	3/94	Builders Excavators Building inspectors	City - 8 hrs DNR - 8 hrs LCD - 8 hrs T/Wash - 4 hrs UWEX/A - 12 hrs	Refreshments - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 24 hrs	Paint & supplies - $ 350
Consulting with industrial operations: Project staff will make individual visits to industrial operations within the watershed to provide information on stormwater management practices.	1994 - 95	Watershed industries	LCD - Hrs. already accounted for	No direct costs
Consulting with yard care services: Project staff will make individual visits to yard care services operating in the watershed to provide information on water quality protection practices.	3/94	Yard care services	UWEX/C - 16 hrs	No direct costs
Consulting with stream frontage property owners: Project staff will make individual visits to property owners on Lowes Creek to provide information on streambank erosion control, habitat enhancement, stream access, and easements.	1994 - 1995	Streambank landowners	LCD - Hrs. already accounted for	No direct costs

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Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools: The Project will enter into an agreement with the Eau Claire School District to develop and implement a water quality curriculum that focuses on nonpoint source water pollution and makes use of Lowes Creek for field investigations. Materials developed by the school district under this agreement would also be made available to private schools serving the Lowes Creek area. The Project will fund development and implementation costs to the school district, and implementation costs to private schools who chose to adopt the curriculum.	Development - 94/95 Implementation - 96	School aged children	DNR - 16 hrs LCD - 16 hrs UWEX/C - 16 hrs UWEX/A - 16 hrs	Development - $ 150
ANNUAL TOTALS			City - 88 hrs DNR - 56 hrs LCD - 88 hrs M/Gardeners - 91 hrs T/Wash - 4 hrs UWEX/C - 142 hrs UWEX/A - 70 hrs	$ 6,130

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Year 3: 1995

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	4 articles/year	Watershed residents Local gov't officials General public	City - 4 hrs DNR - 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs
Television media:	2 segments/year	Watershed residents Local gov't officials General public	City - 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs
Radio media:	4 segments/year	Watershed residents Local gov't officials General public	LCD - 4 hrs UWEX/C - 4 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,125 Postage - 1,590 Photo work - 160 TOTAL - $ 3,875
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100

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Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Garden - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Garden - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 24 hrs	Paint & supplies - $ 350
Consulting with industrial operations:	1994 - 1995	Watershed industries	LCD - Hrs. already accounted for	No direct costs
Consulting with stream frontage property owners:	1994 - 1995	Streambank landowners	LCD - Hrs. already accounted for	No direct costs
Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools:	Development - 94/95 Implementation - 96	School aged children	DNR - 16 hrs LCD - 16 hrs S/Dist. - 48 hrs UWEX/C - 16 hrs UWEX/A - 16 hrs	Development - $ 150
Farm*A*Syst: Group delivery of Farm*A*Syst program materials will be given to assist rural farm and non-farm property owners in identification and correction of potential sources of groundwater contamination.	3 group sessions - 95	Rural farm & non-farm property owners	LCD - 16 hrs UWEX/C - 16 hrs UWEX/A - 16 hrs	Workbooks (30) - $ 450 Meeting costs - 250 TOTAL - $ 700

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Regional focus on the Chippewa River: In concert with Duncan Creek Watershed Project and Lower Eau Claire Watershed Project, develop and implement events and activities that focus on water quality conditions in the Chippewa River and how watershed projects are benefiting the river. Opportunities for information sharing between student water quality monitoring projects in the basin exists.	Development - 95 Implement - 96/97	Chippewa Valley residents	DNR - 8 hrs LCD - 8 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	Development - $ 0
ANNUAL TOTALS			City - 52 hrs DNR - 44 hrs LCD - 92 hrs M/Gardeners - 75 hrs UWEX/C - 100 hrs UWEX/A - 56 hrs	$ 5,470

Year 4: 1996

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	4 articles/year	Watershed residents Local gov't officials General public	City - 4 hrs DNR - 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs

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1Television media:	2 segments/year	Watershed residents Local gov't officials General public	City - 4 hrs LCD - 8 hrs UWEX/C - 4 hrs	No direct costs
Radio media:	4 segments/year	Watershed residents Local gov't officials General public	LCD - 4 hrs UWEX/C - 4 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,185 Postage - 1,640 Photo work - 165 TOTAL - $ 3,990
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100

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Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Gardeners - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 16 hrs	Paint & supplies - $ 350
Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Roofing material publication: Project will produce publication that explains the water quality benefits of using roofing materials that do not contain zinc or copper.	3/96	Contractors Material suppliers Homeowners	UWEX/A - 16 hrs	Printing - $ 500
Water quality education through schools: Implemented by School District; oversight by LCD.	Development - 94/95 Implement - 96-00	School aged children	LCD - 8 hrs	Implement - $ 5,000

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Regional focus on the Chippewa River:	Development - 95 Implement - 96/97	Chippewa Valley residents	DNR - 8 hrs LCD - 8 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	Implement - $ 250
ANNUAL TOTALS			City - 44 hrs DNR - 28 hrs LCD - 68 hrs M/Gardeners - 75 hrs UWEX/C - 68 hrs UWEX/A - 40 hrs	$ 10,483

Year 5: 1997

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	2 articles/year	Watershed residents Local gov't officials General public	City - 2 hrs DNR - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs

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Television media:	0 -1 segments/year	Watershed residents Local gov't officials General public	City - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Radio media:	2 segments/year	Watershed residents Local gov't officials General public	LCD - 2 hrs UWEX/C - 2 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,250 Postage - 1,700 Photo work - 170 TOTAL - $ 4,120
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100
Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Gardeners - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 16 hrs	Paint & supplies - $ 350

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Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools: Implemented through school district; oversight by LCD	Development - 94/95 Implement - 96-00	School aged children	LCD - 8 hrs	Provided in 1996
Regional focus on the Chippewa River:	Development - 95 Implement - 96/97	Chippewa Valley residents	DNR - 8 hrs LCD - 8 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	Implement - $ 250
ANNUAL TOTALS			City - 40 hrs DNR - 26 hrs LCD - 58 hrs M/Gardeners - 75 hrs UWEX/C - 62 hrs UWEX/A - 24 hrs	$ 5,115

Year 6: 1998

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	2 articles/year	Watershed residents Local gov't officials General public	City - 2 hrs DNR - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs

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Television media:	0 - 1 segments/year	Watershed residents Local gov't officials General public	City - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Radio media:	2 segments/year	Watershed residents Local gov't officials General public	LCD - 2 hrs UWEX/C - 2 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,320 Postage - 1,740 Photo work - 175 TOTAL - $ 4,235
Survey of watershed residents: Follow-up of 1993 pre-project survey of water quality attitudes and understanding, current land use practices and favored sources of information.	10/98	Project staff Watershed residents	LCD - 8 hrs NPM - 8 hrs UWEX/C - 8 hrs UWEX/A - 8 hrs	$ 240
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100
Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100

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Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Gardeners - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 16 hrs	Paint & supplies - $ 350
Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools: Implemented through school district; oversight by LCD	Development - 94/95 Implement - 96-00	School aged children	LCD - 8 hrs	Provided in 1996
ANNUAL TOTALS			City - 40 hrs DNR - 18 hrs LCD - 58 hrs M/Gardeners - 75 hrs NPM - 8 hrs UWEX/C - 62 hrs UWEX/A - 24 hrs	$ 5,220

Year 7: 1999

Activity	Schedule	Audience	Assignments	Materials & Costs

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

Newspaper media:	2 articles/year	Watershed residents Local gov't officials General public	City - 2 hrs DNR - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Television media:	0 - 1 segments/year	Watershed residents Local gov't officials General public	City - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Radio media:	2 segments/year	Watershed residents Local gov't officials General public	LCD - 2 hrs UWEX/C - 2 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,390 Postage - 1,790 Photo work - 180 TOTAL - $ 4,360
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100
Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Gardeners - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 16 hrs	Paint & supplies - $ 350
Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools: Implemented through school district; oversight by LCD	Development - 94/95 Implement - 96-00	School aged children	LCD - 8 hrs	Provided in 1996
ANNUAL TOTALS			City - 40 hrs DNR - 18 hrs LCD - 50 hrs UWEX/C - 54 hrs UWEX/A - 16 hrs	$ 5,105

Year 8: 2000

Activity	Schedule	Audience	Assignments	Materials & Costs
Newspaper media:	2 articles/year	Watershed residents Local gov't officials General public	City - 2 hrs DNR - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

Television media:	0 - 1 segments/year	Watershed residents Local gov't officials General public	City - 2 hrs LCD - 4 hrs UWEX/C - 2 hrs	No direct costs
Radio media:	2 segments/year	Watershed residents Local gov't officials General public	LCD - 2 hrs UWEX/C - 2 hrs	No direct costs
Project newsletter/Direct mail:	Spring yard mailing General newsletter Fall yard mailing General newsletter	Watershed residents Local gov't officials	City - 4 hrs LCD - 16 hrs UWEC/C - 16 hrs UWEC/A - 16 hrs	Printing - $ 2,460 Postage - 1,840 Photo work - 185 TOTAL - $ 4,485
Presentations to groups:	As requested	Watershed residents Local gov't officials Interest groups	LCD - 8 hrs UWEX/C - 8 hrs	Publications - $ 100
Display of project exhibit board:	As requested	Watershed residents General public	LCD - 8 hrs	Up-dates - $100
Distribution of yard care and yard waste publications:	On - going	Homeowners	M/Gardeners - 35 hrs UWEX/C - 16 hrs	Maintenance - $ 145
Composting demonstration:	As long as city provides site	Homeowners	M/Gardeners - 40 hrs UWEX/C - 8 hrs	Maintenance - $ 50
Storm drain inlet stenciling:	As groups volunteer	Urban residents	City - 16 hrs	Paint & supplies - $ 350

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

Consulting with architects and engineers:	On - going	Architects Engineers	City - 16 hrs DNR - 16 hrs	No direct costs
Water quality education through schools: Implemented through school district; oversight by LCD	Development - 94/95 Implement - 96-00	School aged children	LCD - 8 hrs	Provided in 1996
ANNUAL TOTALS			City - 40 hrs DNR - 18 hrs LCD - 50 hrs M/Gardeners - 75 hrs UWEX/C - 54 hrs UWEX/A - 16 hrs	$ 5,230

M/Gardeners = Master Gardener Volunteers, NPM = UW Nutrient and Pesticide Management Program, T/Wash = Town of Washington, UWEX/C = County UW Extension, UWEX/A = Area UW Extension

APPENDIX C
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. BOD_5 is the biochemical oxygen demand measured in a five day test. The greater the degree of pollution, the higher the BOD_5.

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/1 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 PCBs 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-tetrachlorodibenzo-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 rated, 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 loading 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.

FLUORANTHENE:

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-dibenzpfurans):

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-tern 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 post 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.

LC_{50}:

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

LD_{50}:
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/1):
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 overfertile 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 plat 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 (RF/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 of 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 proves 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 inundates 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.

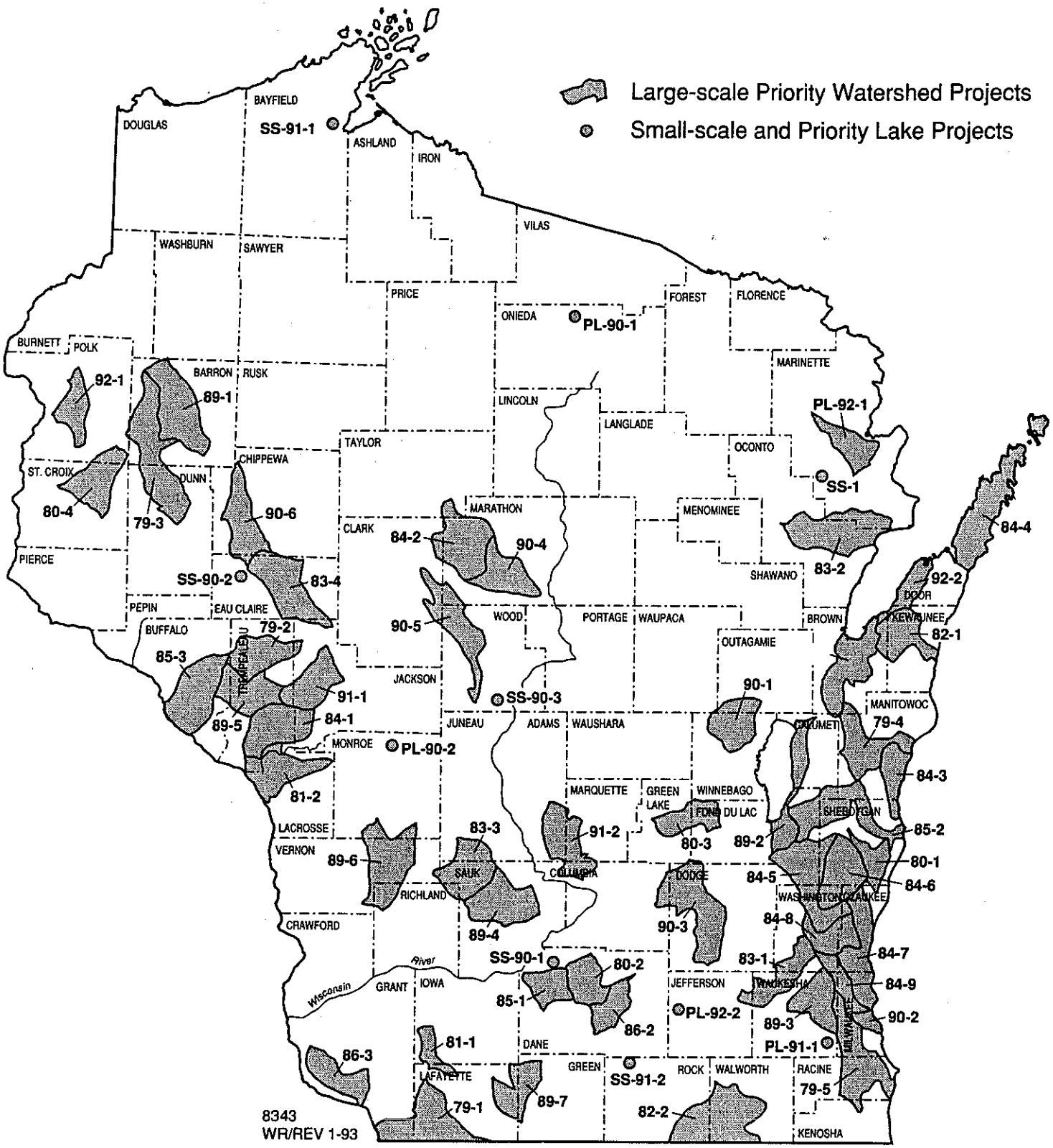
WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT GRANT PROGRAM:

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



PRIORITY WATERSHED PROJECTS IN WISCONSIN
1992

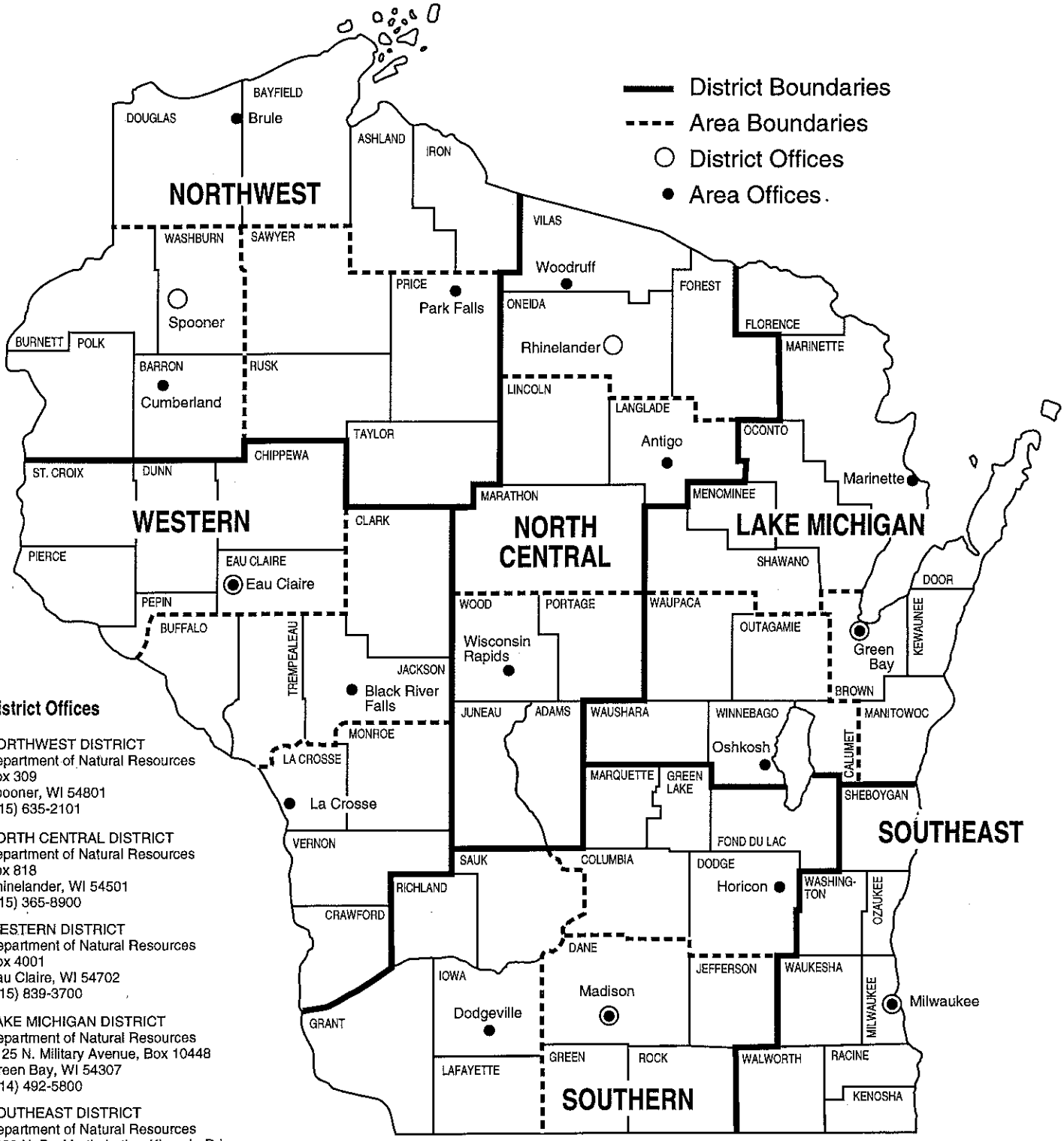
ap Number	Large-scale Priority Watershed Project	County(ies)	Year Project Selected
79-1	Galena River*	Grant, Lafayette	1979
79-2	Elk Creek*	Trempealeau	1979
79-3	Hay River*	Barron, Dunn	1979
79-4	Lower Manitowoc River*	Manitowoc, Brown	1979
79-5	Root River*	Racine, Milwaukee, Waukesha	1979
80-1	Onion 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

) Number	Small-scale Priority Watershed Project	County(ies)	Year Project Selected
SS-1	Bass Lake*	Marinette	1985
S-90-1	Dunlap Creek	Dane	1990
S-90-2	Lowes Creek	Eau Claire	1990
S-90-3	Port Edwards - Groundwater Prototype	Wood	1990
S-91-1	Whittlesey Creek	Bayfield	1991
S-91-2	Spring Creek	Rock	1991

) Number	Priority Lake Project	County(ies)	Year Project Selected
-90-1	Minocqua Lake	Oneida	1990
-90-2	Lake Tomah	Monroe	1990
-91-1	Little Muskego, Big Muskego and Wind Lakes	Waukesha, Racine, Milwaukee	1991
-92-1	Lake Noquebay	Marinette	1992
-92-2	Lake Ripley	Jefferson	1992

)ject completed

DNR Field Districts and Areas



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REV 7/95

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.

WISCONSIN
DEPT. OF NATURAL RESOURCES