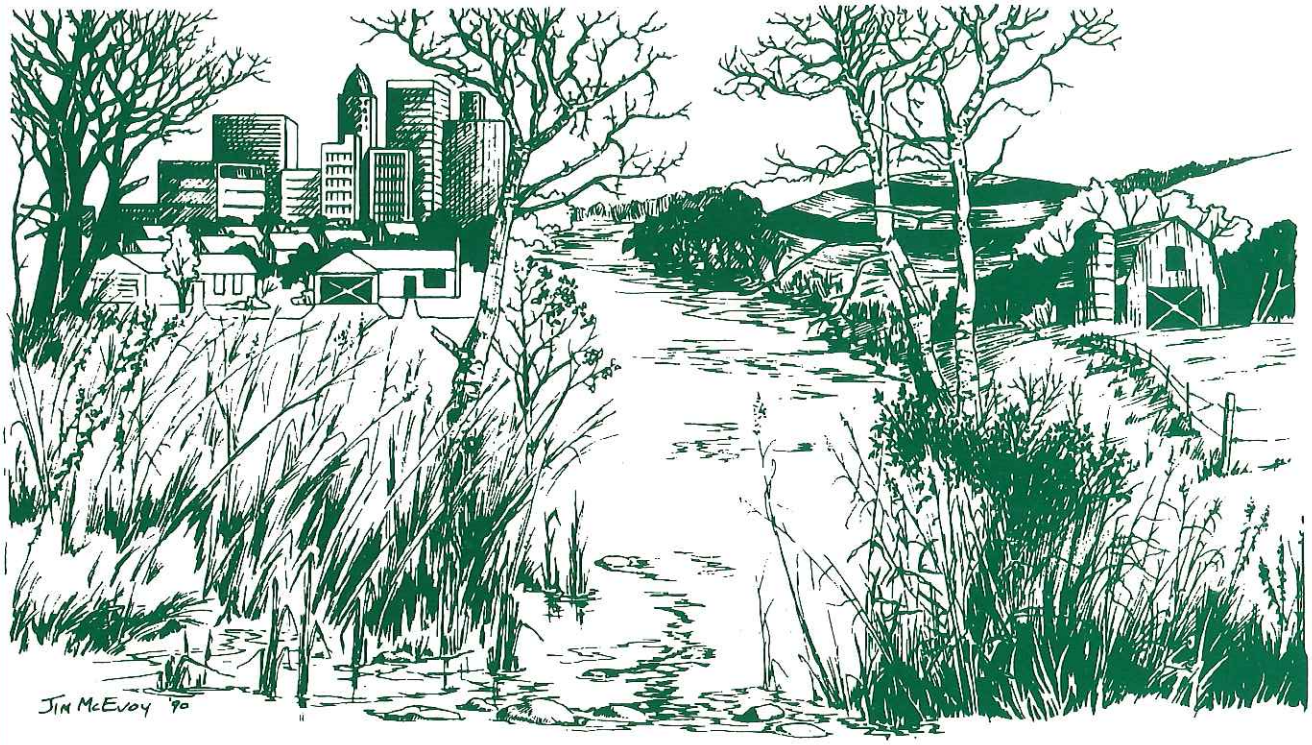
Nonpoint Source Control Plan for the Cedar Creek Priority Watershed Project



MILWAUKEE RIVER
Priority Watersheds Program

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

WATERSHED PLAN ORGANIZATION INFORMATION

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Keith Foye, Chief, Soil and Water Resource Management Section

NONPOINT SOURCE CONTROL PLAN FOR THE CEDAR CREEK PRIORITY WATERSHED PROJECT

The Wisconsin Nonpoint Source Water Pollution Abatement Program

August 1993

This Plan Was Cooperatively Prepared By:

Wisconsin Department of Natural Resources
Wisconsin Department of Agriculture, Trade and Consumer Protection
in cooperation with the Ozaukee and Washington County Land Conservation Departments
and
the Cedar Creek Watershed Citizens Advisory Committee

Publication PUBL-WR-336-93

For Copies of this Document Please Contact:

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

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Watershed Plan Credits

Author

John Pfender, Nonpoint Source & Land Management Section,
Wisconsin Department of Natural Resources (DNR)

Contributing Authors

Gary Korb, University of Wisconsin Extension
Carol Nelson, Department of Agriculture, Trade & Consumer Protection (DATCP)

Editor

Bridget Waite, Nonpoint Source & Land Management Section, DNR

Graphics/Maps

Jim McEvoy, DNR
Southeastern Wisconsin Regional Planning Commission (SEWRPC)

Contributors

Jeff Prey, Nonpoint Source & Land Management Section, DNR
Ken Baun, Nonpoint Source & Land Management Section, DNR
Southeastern Wisconsin Regional Planning Commission
Andy Holschbach, Ozaukee County Land Conservation Department
Perry Lindquist, Washington County Land Conservation Department
Bob Wakeman, Southeast District, DNR

Word Processing

Word Processing Staff, DNR

Milwaukee River Basin Advisory Committee

Norbert J. Hynek, Urban Co-Chair, Milwaukee Metropolitan Sewerage District Committee
Reuben J. Schmahl, Rural Co-Chair, Washington County Board of Supervisors
Bruce Baker, Director, Bureau of Water Resources Management, DNR
Kurt W. Bauer, Executive Director, Southeastern Wis. Regional Planning Commission
Bill Carity, Siepmann Realty, Inc.
John A. Erickson, Engineer, City of Milwaukee
Honorable Margaret Farrow, State Senate
Norman Huth, Director, Milwaukee County Conservation Alliance
Gary Jackson, Water Quality Education Coordinator, UW-Extension
Jim Johnson, Director, Land Resources Bureau, DATCP
Rose Hass Leider, Chair, Ozaukee County Land Conservation Committee
Harold E. Lindemann, Supervisor, Sheboygan County
Ted Manning, Area Conservationist, U.S. Soil Conservation Service
Honorable Michael Miller, Mayor, City of West Bend
Lloyd Owens, Chair, Waukesha County Board
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Hilbert Schuenemann, Supervisor, Washington County Board
Gerald Schwerm, Transportation Director, Milwaukee County Department of Public Works
Brigid Sullivan, Milwaukee County Board
Wallace White, Director, Milwaukee Metropolitan Sewerage District

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Ross Bishop, Vice Chair, Washington County Farmer and Landowner
John Stack, Member-At-Large, City of Cedarburg Administrator
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Brian Schultz, Wastewater Superintendent, Village of Jackson
Joseph Schwai, Landowner, Town of Polk
David Shilling, Southeastern Wisconsin Regional Planning Commission
William Spaeth, Little Cedar Lake Management District
James Struck, Public Works Director, Village of Grafton
Albin VandeBoom, Supervisor, Town of Saukville Board

State of Wisconsin

Department of Agriculture, Trade & Consumer Protection

Alan T. Tracy
Secretary

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

March 17, 1992

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

Dear Mr. ~~Baker~~ Bruce:

The Department of Agriculture, Trade and Consumer Protection has received your request to approve the "Nonpoint Source Control Plan For The Cedar Creek Priority Watershed Project". The Department hereby approves the plan.

We would like to recognize the efforts of all of the DNR staff who helped develop this watershed plan. In particular, John Pfender contributed greatly toward developing the plan and moving it along toward completion. Also, Bob Wakeman developed the nonpoint source pollution reduction goals for each subwatershed, and gave a number of presentations that were well received by the advisory committee members and the public.

We look forward to assisting DNR and the Land Conservation Committees in Ozaukee and Washington Counties in implementing the project. Please contact Keith Foye (266-9496) 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) 266-0157

cc: Becky Wallace DNR WR/2
Andy Holschbach, Ozaukee County Land Conservation Dept.
Perry Lindquist, Washington County Land Conservation Dept.
John Pfender - DNR WW/2
Bob Wakeman - DNR SED

WISCONSIN
DEPT. OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

March 24, 1992

Mr. James L. Swan, Chair, Ozaukee County Board
Mr. Rodney Schroeder, President, Village of Grafton
Mr. Reuben Schmahl, Chair, Washington County Board
Mr. Gerald Boldt, President, Village of Jackson
Mr. John P. Kuerschner, Mayor, City of Cedarburg
Mr. Arthur H. Zabel, President, Village of Germantown
Ms. Constance A. Pukaite, Mayor, City of Mequon

I am pleased to approve A Nonpoint Source Control Plan For The Cedar Creek Priority Watershed Project. I am taking this action pursuant to NR 120.08(2)(cr) Wis. Adm. Code. This approval action follows a recommendation for approval with minor changes by the Cedar Creek Advisory Subcommittee, and approvals of the plan by the Washington and Ozaukee County Boards of Supervisors and the Wisconsin Department of Agriculture, Trade, and Consumer Protection.

This approval authorizes the use of funds from the Nonpoint Source Water Pollution Abatement Program in order to control urban and rural nonpoint pollution sources identified in the watershed project area. These funds must be used consistent with Section 144.25, Stats., NR 120 Wis. Adm. Code, and the priority watershed plan.

Thank you for your participation in helping to develop this priority watershed plan, and I look forward to working with you in carrying out the recommendations which it sets forth.

Sincerely,

C.D. Besadny
Secretary

cc: Ms. Gloria McCutcheon - Director, DNR-Southeast District

RESOLUTION NO. 91-69

CEDAR CREEK PRIORITY WATERSHED PLAN

WHEREAS, the Ozaukee County Board of Supervisors, through adoption of Resolution No. 85-20, expressed its support of the designation of the Milwaukee River Basin as a Priority Watershed project; and

WHEREAS, the Cedar Creek Branch is one of five watersheds in Ozaukee County which are included in the Milwaukee River Basin; and

WHEREAS, the inventory and planning phases of the project have been completed, under the direction of the Ozaukee County Land Conservation Committee, in cooperation with the Wisconsin Department of Natural Resources; and

WHEREAS, a priority watershed plan has been prepared, which assesses the existing water quality and watershed conditions, identifies the management practices and actions necessary to improve or protect the water quality of the watershed, outlines the tasks required and the agency responsible for each and establishes the time frame and cost estimates for the project; and

WHEREAS, a draft of the plan has been available for review and comments were accepted at a public hearing held on February 3, 1992; and

WHEREAS, the implementation of this plan will provide both technical assistance and cost share monies to eligible landowners within the priority watershed for the installation of conservation practices designed to reduce the sources of non point pollution and protect or improve the quality of Ozaukee County's water resources.

NOW, THEREFORE, BE IT RESOLVED, that the Ozaukee County Board of Supervisors does hereby approve the "Non Point Source Control Plan for the Cedar Creek Priority Watershed" and that the Land Conservation Committee be given the authority and responsibility to act in behalf of Ozaukee County to administer this Priority Watershed Project as outlined in the plan.

Dated at Port Washington, Wisconsin, this 4th day of March, 1992.

TO WHOM IT MAY CONCERN:

I, Harold C. Dobberpuhl, County Clerk for Ozaukee County, Wisconsin, hereby certify that the foregoing is a true and correct copy of a Resolution adopted by the Ozaukee County Board of Supervisors on March 4, 1992.

(S E A L)

Harold C. Dobberpuhl
County Clerk

s/ Rose Hass Leider
Rose Hass Leider

James N. Speiden

s/ Robert A. Fechter, Sr.
Robert A. Fechter, Sr.

s/ Howard Cralley
Howard Cralley

s/ John C. Grosklaus
John C. Grosklaus

LAND CONSERVATION COMMITTEE

COUNTY OF WASHINGTON)
) ss.
STATE OF WISCONSIN)

I, ARTHUR G. DEGNITZ, County Clerk of Washington County, do hereby certify that the attached is a true, correct and exact copy of: Resolution No. 89-91-92

Approval of Nonpoint Source Control Plan for the Cedar Creek Priority Watershed

adopted by the WASHINGTON COUNTY BOARD OF SUPERVISORS on: March 10 1992

Dated at West Bend, Wisconsin, this 26th day of August, 19 93.

Arthur G. Degnitz

ARTHUR G. DEGNITZ, COUNTY CLERK
WASHINGTON COUNTY, WISCONSIN

Subscribed and sworn to before me this 26th day of August, 19 93

Dorothy M. Lemke

(Notary)
(Deputy County Clerk)

RESOLUTION NO. 89-91-92

Approval of Nonpoint Source Control Plan for the Cedar Creek Priority Watershed

WHEREAS, the Milwaukee River Watershed (including Cedar Creek) has been selected by the State Legislature and the Department of Natural Resources for priority funding to control nonpoint sources of water pollution; and

WHEREAS, the Land Conservation Committee (LCC), is responsible for implementation of control strategies in the unincorporated areas, which would include providing technical assistance and administering cost sharing agreements with rural landowners through the Land Conservation Department; and

WHEREAS, the Department of Natural Resources has prepared a final draft of the Nonpoint Source Control Plan for the Cedar Creek Watershed which must be approved by the County Board before cost sharing dollars can be made available to local landowners; and

WHEREAS, the Land Conservation Committee has reviewed the final draft of the Cedar Creek plan and recommends approval of the plan by the board;

NOW, THEREFORE, BE IT RESOLVED by the Washington County Board of Supervisors that they hereby approve the Nonpoint Source Control Plan for the Cedar Creek Priority Watershed;

BE IT FURTHER RESOLVED that the Land Conservation Committee is hereby authorized to enter into a Nonpoint Source Grant Agreement with the DNR for the purpose of administering cost sharing dollars to rural landowners with the understanding that there be no direct costs to the county.

DATED this 10th day of March, 1992.

APPROVED:

_____

Corporation Counsel

Dated_____

Introduced by members of the LAND CONSERVATION COMMITTEE as filed with the County Clerk.

Considered MAR 1 0 1992

Adopted MAR 1 0 1992

Ayes____ Noes____ Absent____

Voice Vote_____

Reuben J. Schmahl, Chairperson

Frank B. Falter

John B. Kohl

Daniel W. Stoffel

Paul A. Tuchscherer

(No Fiscal Effect)

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SUMMARY

Introduction

This priority watershed plan assesses nonpoint pollution sources in the Cedar Creek Watershed and sets forth a strategy for reducing their effects on surface waters. Nonpoint source pollution is that which cannot be traced to a single point, such as a municipal or industrial discharge pipe. Examples of these sources in rural areas include: eroding agricultural lands, eroding streambanks, poorly managed barnyards, and some lands spread with manure. These sources pollute surface waters with excessive amounts of sediment, bacteria, and nutrients. Examples of these sources in urban areas include: impervious surfaces such as streets, parking lots, and rooftops in established commercial, industrial, and residential areas; these same impervious surfaces that will be created in the future through urbanization; and eroding construction sites. These sources also pollute surface waters with sediment, bacteria and nutrients. In addition, they are the primary source of urban toxic materials such as heavy metals (such as lead, zinc and copper), oil and grease.

This plan was prepared under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program. The Cedar Creek Watershed was included in the program under a 1984 directive of the Wisconsin Legislature which identified the five watersheds in the Milwaukee River Basin as priority areas for nonpoint source pollution control. Map 1 shows the five watershed of the Milwaukee River Basin. The other Milwaukee River watersheds include: North Branch Milwaukee River, East-West Branches Milwaukee River, Milwaukee River South and the Menomonee River. Plans have already been completed and implementation started in these other four watersheds.

The Wisconsin Department of Natural Resources (DNR), the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), the Ozaukee and Washington County Land Conservation Departments (LCDs), and the Cedar Creek Advisory Subcommittee and Technical Workgroup cooperated in preparing this plan. Plan implementation is a local responsibility shared by individual land owners and local units of government. Local units of government that will play a significant role in carrying out plan recommendations include: Washington County, Ozaukee County, the city of Cedarburg, and the villages of Jackson and Grafton. The Big Cedar Lake Protection and Rehabilitation District and the Little Cedar Lake Property Owners' Association will have more limited responsibilities. The DNR and DATCP will provide administrative and financial support for the project, while the University of Wisconsin-Extension and the USDA Soil Conservation

Service will provide educational and technical assistance. Participation by individual landowners and local units of government is voluntary, although this project does not preclude the DNR, DATCP, and local units of government from using their respective authorities to regulate significant nonpoint pollution sources in the project area.

General Watershed Characteristics

The Cedar Creek Watershed is a 126-square-mile drainage area located in southeastern Wisconsin. The watershed, shown in Map 2, includes all lands draining to Cedar Creek and its principal tributaries, from its headwaters at Big Cedar Lake to its confluence with the Milwaukee River near Grafton. Cedar Creek is the principal stream. Major tributaries include: Lehner Creek, Little Cedar Creek, Frieden's Creek, Evergreen Creek, North Branch Cedar Creek and Cedarburg Creek. There are 19 named lakes and ponds in the watershed with a combined surface area of 1,600 acres. Five of these lakes (Big Cedar Lake, Little Cedar Lake, Mud Lake, Gilbert Lake, Long Lake) are over 30 acres in size, making up 94 percent of the watershed's total lake area. In addition to these lakes there are 15 impoundments on Cedar Creek and its tributaries. Wetlands are some of the most valuable natural resource features in the watershed. The largest contiguous wetland complexes include the Cedarburg Bog and the Jackson Marsh. Additional wetlands are located adjacent to a significant portion of Cedar Creek and its tributaries.

The watershed covers all or part of 16 civil divisions, as shown in Map 3. Seventy-two percent (91 square miles) of the watershed is located in Washington County and 28 percent lies in Ozaukee County. Rural land uses comprise about 110 square miles, or 87 percent of the drainage area. Agricultural lands and wetlands are the dominant rural land uses, making up 64 percent and 16 percent of the watershed land use respectively. Urban land uses cover about 16 square miles, or 13 percent of the watershed. Residential and transportation land uses are most prevalent, making up 9 percent and 6 percent of the watershed land use respectively. Commercial, industrial, institutional, and higher density residential land uses are centered in and around the village of Jackson, the village of Grafton, and the city of Cedarburg. However, low density residential developments are scattered throughout the watershed in both Ozaukee and Washington counties. These scattered developments include the lakeshore developments around Big Cedar and Little Cedar Lake. Urban land uses are expected to increase by about 500 acres in the vicinity of the village of Jackson. This represents a doubling of urban land use for that area. Urban land uses in the vicinity of Cedarburg and Grafton are projected to increase by about 1,100 acres. This represents an increase of about 33 percent in urban land use for this area. On a watershed basis, urban land uses will increase about 45 percent.

Water Quality Problems and Project Objectives

The DNR has identified the potential of surface waters for meeting the range of biological and recreational uses designated by the state of Wisconsin. This potential reflects the uses that these surface waters should support if cultural impacts are reduced or eliminated. The potential biological uses of surface waters are shown in Map 4.

- **Cedar Creek**: The entire main stem is capable of supporting a warm water sport fish community. The entire stream, with the exception of those portions flowing through the Mayfield and Horn's Corners subwatersheds, is large enough to support full-body contact recreation.

- **Lehner Creek**: This tributary is capable of supporting a cold water aquatic community. Brown trout inhabit some portions of the stream. The stream is not large enough to support full-body contact recreation but will support partial-body contact recreational uses.

- **Little Cedar Creek, Kressin Creek, Frieden's Creek, lower Evergreen Creek, Cedarburg Creek, and the North Branch Cedar Creek**: These tributaries are capable of supporting warm water sport fish communities throughout their lengths, either year round or during the seasonal spawning period. Only the lower section of Little Cedar Creek is large enough to support full-body contact recreation; the other tributaries can only support partial-body contact recreational uses.

- **Upper Evergreen Creek, Jackson Tributary, un-named tributary to Cedar Creek (Mayfield), un-named tributary to North Branch (Trenton)**: Limited by size, these three tributaries are capable of supporting warm water forage fish communities and partial-body contact recreation.

- **Lakes**: Most of the lakes and ponds in the Cedar Creek Watershed have the potential to support balanced warm water fish communities. Lehner Lake is unique in that it has the potential to a cold water fish community.

Cedar Creek and most of its tributaries are only partially meeting their biological use potentials. Map 5 shows which streams are now meeting their full potentials in supporting their designated biological uses. The most pervasive and serious impacts to the streams in the watershed include physical habitat loss which affects nearly all streams in the watershed. The habitat loss is caused in part by deposited sediment and in part by channelization. Drainage of riparian wetlands has accompanied much of this channelizing, resulting in loss of habitat and upsets in stream hydrology. In localized areas riparian habitat has been degraded through overgrazing of livestock. This has resulted in the loss of overhanging vegetation and trampling of the streambed. Most of these surface waters are seriously contaminated with

bacteria at levels that violate full-body contact recreational use standards. There has been no water quality monitoring conducted on Cedar Creek or its tributaries to determine the extent to which urban runoff has affected the quality of sediments, surface waters, or biota. Impacts from urban runoff have been monitored in the upper Milwaukee River, however. In addition, it is strongly expected that urban stormwater runoff concentrations frequently exceed acute toxicity discharge standards for point sources.

Generally, degradation of these streams is low to moderate and they are at least partially meeting their designated biological uses. The water resources objective for these mildly degraded streams is to enhance the quality of current biological uses. Lehner Creek, lower Evergreen Creek, and the Jackson Tributary are more severely impacted, however. These streams are not currently meeting their potential biological uses. The water resources objective for these streams is to improve, or change, the type of biological use. For example: the range of cold water aquatic life, including trout, could be extended to lower sections of Lehner Creek; warm water sport fish communities could be extended to lower reaches of Evergreen Creek; and balanced warm water forage fish communities could be re-established in the Jackson Tributary.

Map 5 also shows which lakes are meeting their potential biological uses. Lehner Lake, Mud Lake and Long Lake are fully meeting their biological potential, although indications are that natural winterkill limits Long and Mud lakes to seasonal use. The water resources objective for these lakes is to protect the existing biological uses. The water quality in Big Cedar Lake, Gilbert Lake, and Little Cedar Lake is considered to be good. However, these lakes are considered to be only partially meeting their potential biological uses. Limitations in these lakes are primarily due to aquatic vegetation. The lakes are considered to be threatened with continued degradation by nutrient, bacteria, and sediment loads from nonpoint pollution sources. The water resource objectives for these lakes is to enhance the quality of the current biological and recreational uses.

Nonpoint Pollution Sources

Rural Nonpoint Sources

The Washington and Ozaukee County land conservation departments (LCDs) conducted inventories of eroding agricultural uplands, eroding streambanks, barnyards, and manure spreading practices in the watershed. These are the most important sources of the nutrient, sediment, and bacteria pollution known to be degrading water quality in the watershed's lakes and streams.

The inventory data was evaluated to determine the relative pollution potential of these various sources so that a management plan for rural areas could be developed. The following is a summary of the rural inventory results:

Eroding Agricultural Lands

- All cropland, grassland, pasture, woodland, and wetland fields were assessed.
- These lands deliver an estimated 11,600 tons of sediment to surface waters each year. This is estimated to comprise 80 percent of the total watershed sediment load.
- 97 percent of this rural sediment load comes from cropland.
- A large portion (60 to 70 percent) of the sediment loading from agricultural land comes from lands that have soil loss rates less than the "T" value.

Eroding Streambanks

- All perennial and intermittent stream channels were assessed.
- 41 sites were found to be eroding, trampled, or subject to unrestricted grazing.
- The sediment loading from degraded streambanks is not significant overall. The major concern is habitat degradation and water quality impacts from livestock.

Barnyard Runoff

- 136 barnyards were evaluated.
- 97 barnyards drain to surface waters. Runoff from 88 of these barnyards reaches the surface channel system of lakes and streams, and runoff from 9 of these barnyards drains to pocket wetlands. The remaining 39 barnyards either produce no runoff, or the runoff soaks into the ground (primarily into deeper mineral soils).
- 60 percent of the barnyard pollution that affects lakes and streams comes from 24 barnyards; 70 percent of this pollutant load comes from 36 barnyards.

Winterspread Manure

- An estimated 119 livestock operations spread manure in the watershed.
- About 2,500 acres of land are needed for winterspreading manure.
- An estimated 450 acres of environmentally sensitive lands are spread with manure each winter, posing a water pollution threat during spring runoff.
- 60 percent of the pollution potential from this source is from 22 livestock operations; 75 percent is from 34 livestock operations.

Urban Nonpoint Sources

The Southeastern Wisconsin Regional Planning Commission and the Department of Natural Resources conducted inventories of existing and planned urban land uses, with assistance from the city of Cedarburg, the villages of Jackson and Grafton, and the Big Cedar Lake Protection and Rehabilitation District. Urban land uses in these areas contribute some of the nutrient, sediment, pesticide and bacteria pollution affecting the watershed's lakes and streams. A more important consideration, however, is that these areas are the primary source of a wide array of pollutants carried in urban stormwater. Based on urban stormwater monitoring in Madison and Milwaukee, the most important urban pollutants include heavy metals, pesticides, polycyclic aromatic hydrocarbons, and polychlorinated biphenols. Many other pollutants are present less frequently and in less significant concentrations.

Although there is no monitoring data to assess the impacts of urban runoff on Cedar Creek and its tributaries, elevated concentrations of heavy metals have been monitored in the Milwaukee River downstream of its confluence with Cedar Creek. In addition, it is known from studies conducted in Wisconsin and other states that several of these pollutants are discharged in urban runoff at concentrations that exceed the state standards for aquatic life and public health. Generally, the most significant urban land uses include commercial, industrial, freeway, and high density residential areas. Construction site erosion, however, is potentially a significant sediment source from all construction sites, regardless of land use.

The inventory data was evaluated to determine the relative pollution potential of these various sources so that a management plan for urban areas could be developed. The following is a summary of the urban inventory results:

Existing Urban Land Use

- About 3,170 acres of urban land uses were inventoried in and adjacent to the city of Cedarburg and village of Grafton (Cedarburg Study Area), 450 acres were inventoried in and adjacent to the village of Jackson (Jackson Study Area), and 8,147 acres were inventoried as part of scattered residential developments including the lakeshore developments on Big and Little Cedar Lakes.

- The 14-square-mile Cedarburg Study Area produces about 75 percent of the watershed's heavy metals loading discharged with stormwater. Commercial, industrial, and high density residential land uses make up only 12 percent of the area's urban land use, but contributes 55 to 70 percent of its urban stormwater pollutant loading. Medium density residential areas make up an additional 27 percent of the area's urban land use and contribute an additional 20 to 35 percent of its urban stormwater pollutant loading. It is expected that stormwater concentrations of several pollutants in the urban runoff are exceeding standards for aquatic life and human health.

- The 6-square-mile Jackson Study Area produces about 25 percent of the watershed's heavy metals loading discharged with stormwater. Commercial, industrial, high density residential, and freeway land uses make up only 30 percent of the area's urban land use but contributes 85 to 95 percent of its heavy metals loading. Stormwater concentrations of several pollutants in the urban runoff may be exceeding standards for aquatic life and human health.

- The lakeshore development around Big and Little Cedar Lakes is primarily low density residential property. This is not typically considered a critical urban land use. However, excessive stormwater runoff from agricultural areas floods through these lakeshore areas, picking up pollutants and carrying them to the lakes.

Planned Urban Land Use

- Urban land uses in the Cedarburg Study Area are expected to grow by about 1,060 acres, or 33 percent, by the year 2000. This will increase the existing pollution potential of stormwater runoff from these urban land uses by about 60 to 70 percent. Development is projected primarily in the city of Mequon and the town of Cedarburg, with smaller amounts projected for the city of Cedarburg and the village of Grafton.

- Urban land uses in the Jackson Study Area are expected to grow by about 480 acres, or 107 percent, by the year 2000. This will increase the existing pollution potential of stormwater runoff from urban land uses by about 190 to 210 percent. Development is projected for the village of Jackson, the town of Jackson, and the town of Polk. Ultimately, development in this area could be twice that projected for the year 2000.

- Construction site erosion, which has historically accounted for an estimated 16 percent of the watershed sediment load, will remain a potential source if not adequately controlled. This potential could increase by 10 percent in the Cedarburg Study Area and 145 percent in the Jackson Study Area. Several communities have adopted erosion control ordinances, however, which greatly reduces concern over this potential source.

Pollutant Reduction Goals

The *rural* pollutant reduction goals for this watershed project are to:

1. Reduce sediment delivered to surface waters from agricultural uplands by 50 to 75 percent. Sediment reduction goals are higher (90 percent) for Lehner Creek and lower (30 percent) for Big and Little Cedar Lakes.

2. Reduce nutrient loadings to surface waters from animal waste sources and eroding uplands by 60 percent. Reduction goals are lower (30 percent) for Big and Little Cedar Lakes.

3. Significantly reduce bacterial contamination of surface waters from animal waste sources.

4. Significantly improve degraded shoreland areas by restricting cattle access.

The *urban* pollutant reduction goals for this project are to:

5. Reduce pollutant loading (sediment, nutrients) from uncontrolled construction sites in developing areas.

6. Reduce future mass loading of toxic urban stormwater pollutants from existing and planned urban areas to 50 percent of the 1985 loading values; reduce the average event mean concentration of urban stormwater pollutants where needed to meet the acute toxicity standards in discharge pipes.

7. In planned urban areas, maintain peak flow runoff characteristics under the 2-year, 24-hour rainfall conditions at levels consistent with pre-development conditions. Where possible, maintain stream base flows by infiltrating stormwater runoff.

8. Reduce the erosive capacity of rural runoff that flows through the lakeshore developments around Big Cedar Lake and Little Cedar Lake.

9. Reduce general stormwater contamination through source area controls in all urba areas.

Recommended Management Actions

This watershed plan establishes criteria that will be used to identify the most significant nonpoint sources of water pollution in both rural and urban areas. These criteria are developed so that technical and financial assistance can be targeted at those pollution sources having the greatest need for management.

Rural Management Recommendations

Rural nonpoint sources are assigned to one of three management categories. Sources that meet the criteria for *Management Category I* must be controlled to meet the pollutant reduction goals of the project. These sources are eligible for cost sharing and are essential to

include on any cost-share agreement. Sources that meet the criteria for *Management Category II* are less significant, but will provide some additional control. In some cases, significant sources are put in this category because control may not be practical. Sources in Management Category II are eligible for cost sharing, but inclusion on cost-share agreements is not essential. All remaining sources are placed in *Management Category III*. These sources are not significant, and are not eligible for technical or financial assistance under the Nonpoint Source Program.

Management recommendation for rural nonpoint sources are summarized below for each of the major pollution sources:

- **Upland Erosion and Sediment Delivery**: Acceptable sediment delivery rates (tons/acre/year) are defined in this plan for each subwatershed. If acceptable rates are achieved on all fields, then the established pollutant reduction goals will be met.

  Fields that currently exceed the sediment delivery target rate and that have a soil loss rate exceeding 2 t/a/y are placed in Management Category I. Fields that currently exceed the sediment delivery target rate and that have a soil loss rate of 2 t/a/y or less are placed in Management Category II. Fields that have sediment delivery rates less than the sediment delivery target rate are placed in Management Category III.

  There are 22,145 acres targeted for management. There are 13,185 acres in Management Category I, representing 58 percent of the needed control. There are 8,960 acres in Management Category II, representing 42 percent of the needed control.

- **Streambank Degradation Sites**: Management categories are established based on streambank erosion and also on streambank degradation caused by cattle access. Currently, sediment loads from streambank erosion is insignificant compared to other sediment sources. There is, however, a need to control 23 sites where cattle access is suspected to be causing degradation of habitat or water quality. All such sites are placed in Management Category I.

- **Barnyard Runoff**: Barnyards draining to lakes and streams that produce an estimated event loading of phosphorus (10-year, 24-hour rain) exceeding 10 pounds are placed in Management Category I. Barnyards draining to lakes and streams that produce event loads of 7 to 10 pounds are placed in Management Category II. Barnyards draining to lakes and streams that produce mass loads less than 7 pounds are placed in Management Category III. Barnyards draining to pocket wetlands will be reviewed on a case-by-case basis to determine an appropriate management category. All other barnyards are placed in Management Category III.

There are 24 barnyards in Management Category I, representing 100 percent of the control needed to protect lakes and streams. There are 12 barnyards in Management Category II, representing an additional 10 percent control.

- **Manure Spreading**: Livestock operations that winterspread manure on at least 8 environmentally sensitive acres per year are placed in Management Category I. If 5 to 8 environmentally sensitive acres are spread per year, the operation is placed in Management Category II. If fewer than 5 acres are spread, the operation is assigned to Management Category III.

  There are 22 livestock operations in Management Category I, representing 100 percent of the needed control. There are 12 livestock operations in Management Category II, representing an additional 15 percent control.

- **Nutrient Management**: All landowners will be encouraged to practice sound nutrient management for the protection of surface and ground waters. At a minimum, landowners who receive cost sharing for any animal waste controls must develop and follow a nutrient management plan that protects surface and ground waters where manure is spread.

- **Using Easements to Support Practices**: Easements may be purchased with Nonpoint Source Program funds where needed to control sources in Management Category I or II. Easements may only be purchased if the management practice being used is either a shoreline buffer, critical area stabilization, or wetland restoration. Generally, easements may be purchased anywhere in the watershed provided they are part of the least-cost practicable control alternative. However, this least cost restriction is removed in certain areas of the watershed. These areas include: a) livestock access sites, b) wetland restoration sites, c) riparian lands along Cedar Creek, d) riparian lands along any perennial or intermittent stream in the Evergreen Creek, North Branch, Trenton Township and Lehner Creek subwatersheds, e) uplands in the Lehner Creek Subwatershed. About 1,400 acres of land are potentially eligible for easement acquisition in rural areas.

Urban Management Recommendations

Recommended nonpoint source control activities in urban and urbanizing areas are divided into two groups to allow a phased approach to implementation. *Core* group activities are generally non-structural, low in cost, pose few technical problems, and should be readily accepted by the community. *Segmented* activities are those that are generally structural, expensive, will require additional engineering feasibility work prior to design and installation, and may require the community to make controversial decisions about land use. Communities will agree to conduct basic Core level activities as a first step in carrying out the following

the following recommendations. Once this commitment is made, each community will negotiate Segmented activities with DNR and carry them out in a phased program.

Existing Urban Areas

Each community should develop and implement a specific program of urban "housekeeping" measures to help control urban stormwater pollution at its source. This program should include a community specific information and education (I&E) program to help citizens practice good source control measures. These are Core activities.

Each community should adopt and enforce a comprehensive stormwater management ordinance consistent with the state's model ordinance, which will be developed in the future. This is a Segmented activity.

To meet urban pollutant reduction goals, a level of control is required that is equivalent to providing wet detention treatment for 100 percent of the critical urban land uses. Critical land uses include commercial, industrial, multi-family residential, and freeway land uses. In the Cedarburg Study Area it is estimated that feasibility studies will need to address 380 to 1,800 acres of land, and that up to 6.5 acres of detention ponds or their equivalent will need to be designed and installed. These activities will occur primarily in the city of Cedarburg with small amounts of activity in the town of Cedarburg and village of Grafton. In the Jackson Study Area it is estimated that feasibility studies will need to address 130 to 450 acres of land, and that up to 2.3 acres of detention ponds or their equivalent will need to be designed and installed. These activities will occur primarily in the village of Jackson, with lesser activity in the towns of Jackson and Polk. Additional stormwater planning is needed to determine how to limit gully formation and erosive sheet flows in urban areas around Big and Little Cedar Lakes. These are all Segmented activities.

There are definite benefits to an intensive street sweeping schedule during the early spring and late fall clean-up periods. There may also be some benefits to an accelerated street sweeping schedule for streets and parking lots in critical land uses during the period from late spring to early fall. More information is needed, however, before recommendations can be made for accelerated street sweeping during this time period. This is a Segmented activity.

Planned Urban Areas

The I&E program (Core activity) and intensive spring and fall street sweeping (Segmented activity) mentioned above should be extended to new urban developments.

Each community should adopt and enforce a comprehensive stormwater management ordinance consistent with the state's model ordinance, which will be developed in the future. This is a Segmented activity.

To meet urban pollutant reduction goals, a level of control is required that is equivalent to providing wet detention treatment for 100 percent of all new development. In the Cedarburg Study Area it is estimated that feasibility studies will need to address 1,060 acres of land, and that up to 13 acres of detention ponds or their equivalents will need to be designed and installed. If grassed swale drainage is used, as few as 8 acres of detention or its equivalent may be needed. These activities will occur in the cities of Cedarburg and Mequon, the village of Grafton, and the towns of Cedarburg and Grafton. In the Jackson Study Area it is estimated that feasibility studies will need to address 480 acres of land, and that 10 acres of detention ponds or their equivalents will be needed. If grassed swale drainage is used, as few as 6 acres of detention or its equivalent may be needed. New development is anticipated to occur in the village of Jackson and in the towns of Jackson and Polk. Additional stormwater planning for new development is also needed in the drainage area to Gilbert Lake, along State Highway 33, and in areas of platted residential subdivision located in the drainage area to Little Cedar Lake. These are Segmented activities.

Developing Areas

The planned urbanization mentioned above will create the potential for construction site erosion. It is recommended that all communities have and enforce a construction site erosion control ordinance consistent with that adopted by the state of Wisconsin. Construction erosion control practices should be consistent with the practice standards and specifications included in the *Wisconsin Construction Site Best Management Practice Handbook* (DNR, 1989). Currently, the city of Mequon, city of Cedarburg, and village of Jackson all have adequate erosion control ordinances. Improvements are needed in the existing ordinance coverage for the village of Grafton and the unincorporated portions of Washington and Ozaukee counties. Ordinance adoption and enforcement are Core activities.

Project Budget and Cost Sharing

The following table shows the estimated costs of carrying out these management recommendations. The total cost of meeting all projected needs is $9.1 million. About $3.4 million, or 37 percent of the total cost, is needed for rural nonpoint source controls. About $5.7 million, or 63 percent of the total cost, is needed for urban controls.

The state share of the total rural cost is projected to be $2.5 million, or 74 percent of the rural project needs. This includes support for the additional land conservation department staff needed to provide technical assistance and information & education for the project. This is estimated to be two to three additional staff members per year in Washington County and half to one additional staff person per year for Ozaukee County. In addition, the state covers 50 to 70 percent of practice installation costs and 100 percent of easement purchase costs.

Table S-1. Estimated Total Cost of Implementing the Cedar Creek Priority Watershed Project[1]

Project Element	Total Cost	State Share	Local Share
AGRICULTURAL AREAS			
1. BMPs	$2,465,000	$1,590,000	$875,000
2. Easement Purchases	$200,000	$200,000	$0
3. LCD Staff Support	$714,000	$705,000	$9,000
Subtotal	$3,379,000	$2,495,000	$884,000
DEVELOPING URBAN AREAS			
4. Construction Site BMPs	$924,000	$0	$924,000
5. Ordinance Administration	[2]		
Subtotal	$924,000	$0	$924,000
PLANNED URBAN AREAS			
6. Stormwater Management Plans	$94,000	$94,000	$0
7. Stormwater Management BMPs	$1,600,000	$0	$1,600,000
Subtotal	$1,694,000	$94,000	$1,600,000
EXISTING URBAN AREAS			
8. Feasibility Studies	$138,000	$138,000	$0
9. Structural BMPs (Detention)	$3,520,000	$1,990,000	$1,530,000
10. Accelerated Street Sweeping	[2]	[3]	[3]
Subtotal	$3,658,000	$2,128,000	$1,530,000
INFORMATION & EDUCATION[4]			
11. Direct Cost to UWEX	$9,400	$9,400	
12. Direct Cost to County LCDs	$13,600	$13,600	
Subtotal	$23,000	$23,000	
WATERSHED TOTAL COST	$9,678,000	$4,740,000	$4,938,000

1 Costs are those needed to meet 100% of the nonpoint source control needs.
2 No estimate of need has been made.
3 State and local shares will be negotiated with each community if needs are identified.
4 LCD staff costs are accounted for above. UWEX staff costs are accounted for in other budgets. All direct costs are for a three year period only. Additional funds will be needed for years 4-8 of the project.

Source: Wisconsin DNR

Local monies in rural areas will be spent primarily by individual landowners who will pay 30 to 50 percent of the practice installation on their properties.

The state share of the total urban cost is projected to be about $3.3 million, or 50 percent of the urban project needs. State funds cover many staff activities including information and education, development and enforcement of construction site erosion control and stormwater ordinances, stormwater planning and feasibility studies for existing and planned urban areas, practice design for existing areas, and potentially staff for accelerated street sweeping. In addition state funds cover 70 percent of the cost of urban structural practices in existing urban areas and up to 50 percent of the cost of storm sewer re-routing work and land acquisition. The state program funds will not cover the cost of construction site erosion control practices or the cost of practice design or installation in planned urban areas. Local monies in urban areas will be spent by both individual landowners and by municipal units of government.

Project Implementation Procedures

Responsibility for implementing this project in rural areas rests with the county land conservation departments. In urban areas, the responsibility rests with each local unit of government. The Department of Natural Resources and Department of Agriculture, Trade and Consumer Protection provide state-level guidance and funding support. Other supporting agencies include University of Wisconsin-Extension and the USDA Soil Conservation Service.

During the first three years following the approval of this plan, land conservation department staff will contact landowners who have critical pollution sources. Landowners may enter into cost-sharing agreements with their respective county during this period. The cost-share agreement specifies the practices to be installed, an installation schedule, projected total costs and cost-share funding that will be available. Once an agreement is signed, the landowner has up to five years to install practices specified on the agreement. Landowners pay their own bills in full and then are reimbursed the appropriate amount upon request by the land conservation department staff. All practices must be maintained for at least 10 years.

In urban areas, each municipality will contact the DNR Southeast District Nonpoint Source Coordinator to begin the process of establishing a Core program. After this has been agreed to, the community can begin identifying Segments that it wishes to complete. The Core program should be identified within the first year. Segmented activities can be added each year of the project right up through the end of the eight year project period.

The Department of Natural Resources maintains two grants with each county and municipality that participates in this watershed project. One of these grants contains funds needed by the county or municipality to reimburse landowners or municipal treasuries for practices that are

installed. The other grant contains funds needed by the county or municipality to support additional staff needed to conduct technical assistance and educational activities. These funds can be used either to hire employees who will work directly for the county or municipality, or to contract with professional consultants who can provide the needed services. Both grants are updated regularly through an annual workload and grant application process conducted jointly with the DNR, DATCP and the county.

Project Evaluation and Monitoring

Data will be collected, analyzed and reported in three areas. Reporting frequencies and content for local units of government involved in the watershed project are specified in the watershed plan.

- **Administration**: This includes progress in completing activities scheduled in this watershed plan and subsequent annual work plans. In rural areas it includes progress in contacting landowners, developing farm plans and cost-share agreements, designing and installing practices that are included on cost-share agreements, and conducting I&E activities. In urban areas, it includes progress in adopting and enforcing construction site erosion and stormwater ordinances, stormwater planning for new development, "housekeeping" programs, and I&E activities. Financial and time reports are also required.

- **Pollutant Reduction**: This includes calculated changes in urban and rural pollutant loading that result from management actions taken during this project.

- **Water Resources**: Changes in surface water quality will not be monitored in this watershed. Similar sites located elsewhere in the Milwaukee River Basin and Southeastern Wisconsin will be monitored to determine the impact of nonpoint source management practices on surface waters. These results will be extrapolated to the Cedar Creek Watershed.

CHAPTER ONE
Plan Purpose and Legal Status

Introduction

The Cedar Creek Watershed is one of five drainage areas in the Milwaukee River Basin. In 1984, all watersheds in the basin were legislatively designated as "priority watersheds" under the Wisconsin Nonpoint Source Water Pollution Abatement Program. Map 1 shows the Cedar Creek Watershed in relation to the other priority watersheds in the basin. It joins 50 other watersheds statewide, encompassing more than three million acres, in which the clean-up and protection of water resources through control of nonpoint sources of pollution is a priority for the state Department of Natural Resources (DNR).

The DNR, the state Department of Agriculture, Trade and Consumer Protection (DATCP), and local units of government cooperatively prepared this priority watershed plan. This plan will guide implementation of the watershed project. The priority watershed plan assesses nonpoint and other sources of water pollution and identifies best management practices needed to meet specific water resource objectives. The plan guides implementation of these practices to improve water quality.

Nonpoint Source Water Pollution Abatement Program

The State Legislature created the Nonpoint Source Water Pollution Abatement Program (Nonpoint Source Program) in 1978. The program goal is to reduce pollutants from urban and rural nonpoint sources to improve and protect the water quality of streams, lakes, wetlands and groundwater. Nonpoint sources include: eroding agricultural lands, eroding streambanks and roadsides, runoff from livestock wastes, erosion from developing urban areas, and runoff from established urban areas. Pollutants from nonpoint sources are carried to the surface water or groundwater through rainfall runoff, or seepage, and snowmelt.

The following is a program overview:

- DNR and DATCP administer the program at the state level. The program focuses on critical hydrologic units called priority watersheds. The program is implemented through priority watershed projects, which include implementation plans.

- Local units of government implement the plan. Water quality improvement is achieved through voluntary implementation of nonpoint source controls (best management practices) and adoption of ordinances. Landowners, land renters, counties, cities, villages, towns, sanitary districts, metropolitan sewage districts, regional planning commissions and lake districts are eligible to participate.

- Technical assistance is available to design best management practices. State level cost-share assistance is available to offset the cost of installing these practices.

- Informational and educational activities are employed to encourage participation.

Project Planning and Implementation Phases

Planning Phase

The planning phase of the Cedar Creek priority watershed project began in 1986. The planning phase included steps to:

1. Determine the conditions and uses of streams and lakes.

2. Inventory types of land uses and severity of nonpoint sources affecting streams and lakes.

3. Evaluate the types and severity of other factors which may be affecting water quality. Examples include discharges from municipal wastewater treatment plants and natural or endemic stream conditions. (This has been completed through the ongoing integrated resource management planning efforts in the Milwaukee River Basin.)

4. Determine nonpoint source controls and other measures necessary to improve and/or protect water quality.

5. Prepare and gain approval of a program for local implementation of the project so that plan recommendations would be carried out.