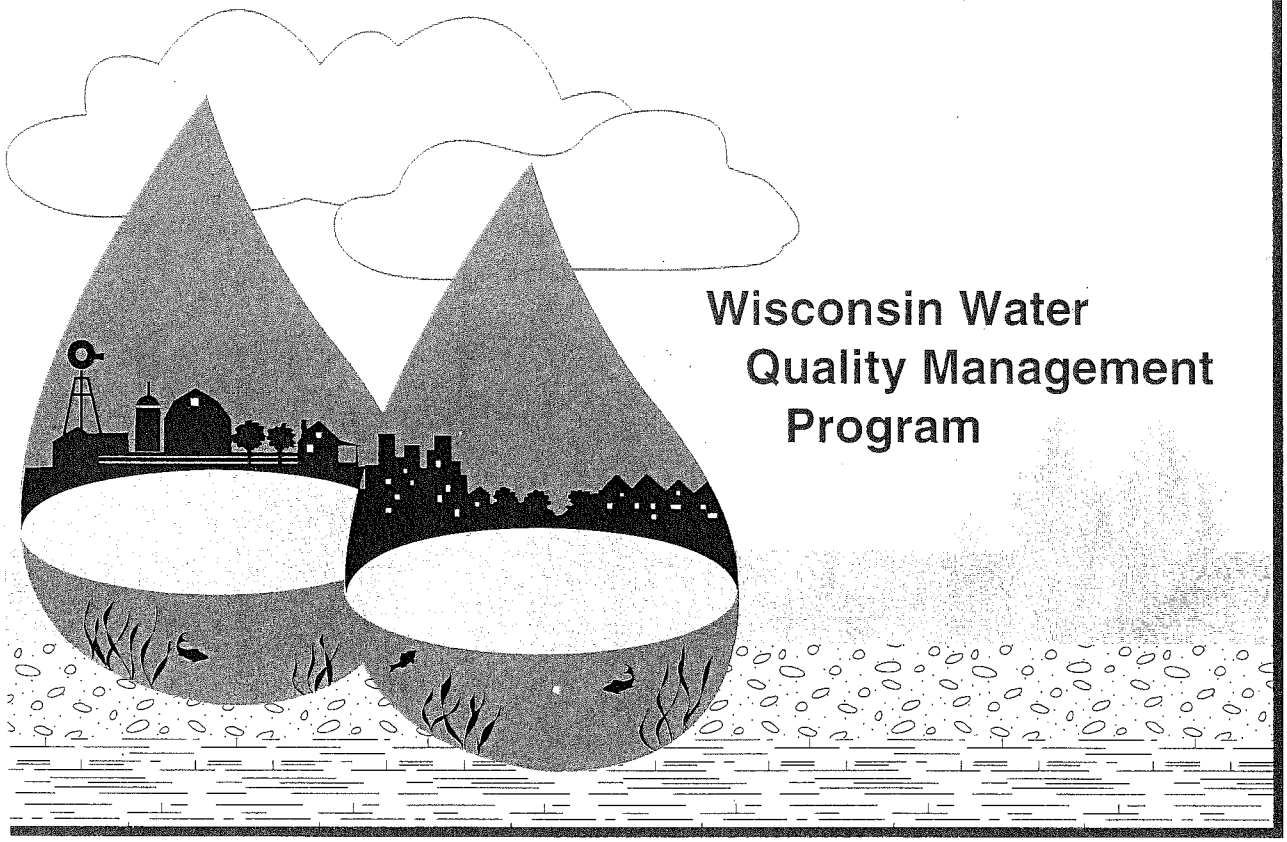
SUGAR-PECATONICA RIVERS

WATER QUALITY MANAGEMENT PLAN

A Five-Year Plan to Protect and
Enhance our Water Resources

MARCH, 1995

PUBL-WR-144-95-REV



Wisconsin Water Quality Management Program

SUGAR-PECATONICA RIVERS WATER QUALITY MANAGEMENT PLAN

MARCH, 1995

PUBL No. WR-144-95 REV

Printed on
Recycled Paper

A Publication of the Department of Natural Resources

NATURAL RESOURCES BOARD

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

Wisconsin Department of Natural Resources

George E. Meyer, Secretary
Ron L. Semmann, Deputy Secretary
Maryann Sumi, Executive Assistant

Susan L. Sylvester, Administrator
Division for Environmental Quality

James Huntoon, Director
Southern District Office

Bruce J. Baker, Director
Bureau of Water Resources Management

Charles R. Ledin, Chief
Water Resources Policy and Planning

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
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

SUBJECT: Update of the Sugar-Pecatonica Rivers Basin Plan

Dear Interested Citizen:

The water quality management plan that guides water resources activities in the Sugar-Pecatonica Rivers Basin was prepared by Steven Fix in the Southern District office, with the help of the Water Resources Management Policy and Planning Section of the Department of Natural Resources. Additional contributions and technical assistance came from many others outside of the department. This plan is the basis for water resources management priorities and activities for the next five years.

The primary water quality problems in this basin are caused by polluted runoff, particularly from agricultural and urban areas. Modification of wetlands and rapid development have contributed to these water quality problems. Watersheds that ranked high for selection as nonpoint source priority watershed projects to abate polluted runoff are **Gordon Creek** in Iowa and Dane counties, **Yellowstone River** in Lafayette and Iowa Counties, **Upper Sugar River** and **West Branch Sugar River**, both in Dane County. In addition, **Raccoon Creek** in Rock County, **Gill, Ross Crossing and Liberty creeks** in Green County and **Richland Creek** also in Green County ranked high for selection as small-scale priority watershed projects.

In addition, general information about industrial and municipal point source dischargers are listed along with long-term operational recommendations.

Thank you for your participation and continued involvement in the management of the water resources in this part of the state.

Sincerely,

Chuck Ledin

Chuck Ledin, Chief
Water Resources Planning and Policy Section
Bureau of Water Resources Management

ACKNOWLEDGMENTS

Preparation of the Sugar-Pecatonica Rivers Water Quality Management Plan is an effort of the Department of Natural Resources' Southern District, with support from staff in the bureaus of Water Resources Management, Fisheries Management, and Wastewater Management. Many individuals contributed to the plan by providing information, conducting analyses, and reviewing its contents. Their help is much appreciated.

Primary Author: Steven M. Fix

Contributors: Roger Schlesser, Jack Saltes, George Osipoff, Andy Morton, Dave Marshall, Michael Vollrath, Andy Morton, Scot Stewart, Donald Bush, Eugene Van Dyke, Tom Bennwitz, Karin Van Vlack, C. Topf Wells, Kevin Conners-Dane County Land Conservation Department, Louis Bobolz-Rock County Land Conservation Department, William Lane-Dane County Regional Planning Commission.

Other Acknowledgments

Editor: Meg Turville-Heitz

Graphics: BIM-GEO Services and Janet Sausen

This publication was partially funded by a 205(j) grant from the U.S. Environmental Protection Agency.

CONTENTS

INTRODUCTION

This update to the Sugar-Pecatonica Rivers Water Quality Management (WQM) Plan is required by the Federal Clean Water Act and Wisconsin Administrative Code NR 121. This basin includes the Sugar and Pecatonica rivers in Wisconsin, and all streams that flow to either river within the state. This update outlines actions the Wisconsin Department of Natural Resources (DNR), industries, communities, counties, and other agencies need to take in the next five years and beyond to further protect and improve the waters of the Sugar-Pecatonica basin.

The 1988 Sugar-Pecatonica River Water Quality Management plan made a number of recommendations. Many recommendations from the original plan have been implemented. Now our challenge is to address new and remaining water quality issues. We also need to protect the improvements in water quality gains we have made.

Wisconsin citizens, industries, and agencies have worked together to improve and protect the waters of the basin. This update identifies remaining and new areas of water quality concerns and stresses the importance of safeguarding our water quality achievements.

PLAN OBJECTIVES

The goal of this plan is to identify areas of water quality concerns and identify management objectives for the water resources of this basin. Surface water quality has improved throughout the state since Wisconsin passed its version of the Federal Clean Water Act in 1974, but more must be done if we are to achieve the "fishable, swimmable waters" set as our goal. All who are concerned about our streams and lakes know pollution control and water quality protection are not one-time efforts, but require an ongoing commitment to clean water.

The Sugar - Pecatonica River WQM plan focuses on:

1. Surface water monitoring and assessment needs
2. Nonpoint source pollution management
3. Management of toxic contaminants

All of these issues require a comprehensive management approach both within the DNR and with other agencies and public or private groups. Included in this plan is information and recommendations for stream use classifications for most streams, rivers, creeks, and lakes.

The specific goals of this plan are:

* Identify water quality problems in order to set priorities and provide guidance for management activities for specific lakes and streams.

* Identify water quality needs.

* Rank watersheds to determine if they are eligible as nonpoint source priority watersheds.

* Anticipate future management activities necessary for water quality protection.

* Integrate and coordinate DNR programs for managing both surface and groundwater resources in Wisconsin.

* Incorporate the public's concerns and increase public awareness of everyone's responsibilities to water quality protection and improvement.

PLAN ORGANIZATION

This plan consists of:

* The Recommendations Report, which summarizes all recommendations made within the entire plan.

* The Surface Water Quality Report, which identifies water quality goals, problems, improvements, monitoring and management needs for streams in the basin. This section includes the nonpoint source element and a lakes element.

* The Point Source Report, which examines existing and future wastewater treatment facility and management needs.

Separate from this document but included as amendments of the whole plan, are any statewide and site-specific water quality management plans which have been formally approved and incorporated into this publication by reference. These include nonpoint source priority watershed plans, county nonpoint source and water quality assessment reports, and lake management plans.

THE RECOMMENDATIONS REPORT

The Recommendations Report begins with a general explanation of the types of recommendations this plan will make. It then lists all recommendations by watershed. These recommendations will be used to help set DNR priorities and develop yearly work plans for future DNR water resources management activities.

THE SURFACE WATER QUALITY REPORT

The Surface Water Quality Report identifies water quality goals and problems. The report also identifies management activities needed to improve and protect these waters. This part of the plan addresses the following questions/elements:

* Which streams should be monitored?

* What are the water quality goals?

* Are water quality goals being achieved?

* What are the use problems associated with streams in the basin?

* Are there possible toxic water quality problems in the basin?

* Identify high quality lakes that should receive highest priority for protection and/or management efforts.

* Identify lakes affected by nonpoint sources of pollution.

* Identify which lakes need monitoring.

* Identify information and criteria used to make lake management decisions.

The Surface Water Quality Report consists of a summary of the water quality conditions of selected streams, by watershed. The report includes a narrative for each watershed describing the water quality status of specific waterbodies based on the application of the above questions, and the recommended actions needed to remedy existing or potential water quality problems. This information is presented in the watershed tables to provide a complete assessment of the current and potential uses of the waterbodies.

THE NONPOINT SOURCE ELEMENT

This element contains information used for selecting nonpoint source priority watersheds.

* What streams and lakes are affected by nonpoint source pollutants, and what are the priorities for nonpoint source pollution monitoring and management in the basin?

* Which watersheds are a high priority for control of nonpoint source pollutants?

THE POINT SOURCE REPORT

The Point Source Report discusses existing and future wastewater treatment plants (WWTPs) and management activities needed to meet effluent limits and other Wisconsin Pollutant Discharge Elimination System (WPDES) permit conditions. The following questions are addressed in the report:

* What basin point sources are possible sources of toxins?

* What management needs are necessary to ensure waters receiving point source discharges are meeting water quality standards?

If you have further questions about using this plan or on subjects covered by it, contact your DNR Water Quality and Resource Management staff at your DNR district office, or:

Steven Fix
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, Wisconsin 53711
608-275-3280.

RECOMMENDATIONS REPORT

The Recommendations Report summarizes management recommendations made throughout the plan, listing recommendations by watershed and program.

STATUS OF PLAN RECOMMENDATIONS

Some recommendations are purely advisory, while conformance to others is mandated by state statutes and codes. Following are some instances where consistency with plan recommendations is required by law:

* Where grants and loans are awarded for items such as wastewater treatment plant construction and sewer rehabilitation projects;
* In the authorization of Wisconsin Nonpoint Source Water Pollution Abatement Program funds;
* In the issuance of Wisconsin Pollutant Discharge Elimination System (WPDES) permits; and
* For approval of sewer system facility plans and sewer extensions.

The following classification system is used to identify the status of all management recommendations. The classifications are noted in parentheses after each recommendation.

Type A: These recommendations are based on Wisconsin State Statutes and administrative codes and thus are binding unless the plan is formally revised.

Type B: These recommendations are a basis for work planning or other decisions which must be approved by the appropriate DNR division administrator (The recommendations are a starting point for the work planning process.)

Type C: These recommendations are advisory to the public, local governments, lake management organizations, and other groups or agencies. These recommendations are not binding. No statutory or codified requirements exist.

RECOMMENDATIONS BY WATERSHED

HONEY AND RICHLAND CREEKS (SP01)

Management

1. The city of Monroe should develop a sewer service area plan by the time of its next Wisconsin Pollutant Discharge Elimination System (WPDES) permit reissuance to assist the city in planning and guiding growth (Type C).

Monitoring

2. The Bureau of Water Resources Management (WRM) should conduct condition monitoring in Honey and Richland Creeks watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

3. WRM should conduct Hilsenhoff biotic index and habitat assessment monitoring of Honey Creek to determine what effects, if any, the Monroe wastewater treatment plant has on in-stream habitat (Type B).

Nonpoint Source

4. The nonpoint source priority watershed selection committee should consider Richland Creek a high priority candidate for possible selection as small-scale nonpoint source priority watershed project (Type B).

JORDAN AND SKINNER CREEKS (SP02)

Management

5. The Bureau of Parks and Recreation, with the assistance of Water Resources Management, should undertake expanded self-help monitoring on Zanders Lake and Beckmans Lake at Browntown-Cadiz Springs State Recreation area to begin to address water quality problems of the lake (Type B).

YELLOWSTONE RIVER (SP04)

Monitoring

6. Water Resources Management should conduct condition monitoring in the Yellowstone River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

7. Parks and Recreation, with the assistance of Water Resources Management, should undertake monitoring on Yellowstone Lake, using the lakes ambient monitoring protocol, to address water quality problems caused by polluted runoff (Type B).

Nonpoint Source

8. The nonpoint source priority watershed selection committee should consider the Yellowstone River Watershed a high priority candidate for a priority watershed project under the state's nonpoint source water pollution abatement program (Type B).

GORDON CREEK (SP05)

Monitoring

9. Water Resources Management should conduct condition monitoring on principal streams in the Gordon Creek Watershed as part of the basin assessment monitoring effort (Type B).

Nonpoint Source

10. The nonpoint source priority watershed project selection committee should consider the Gordon Creek Watershed a high priority candidate for selection as a priority watershed project under the nonpoint source pollution abatement program (Type B).

Point Source

11. The village of Blue Mounds should review its operation and capacity and take necessary steps to address the potential population increase by the time of its next WPDES permit issuance (Type C).

UPPER EAST BRANCH PECATONICA RIVER (SP06)

Management

12. County zoning offices should vigorously enforce shoreland-wetland zoning ordinances in the Upper East Branch Pecatonica River Watershed (Type C).

Monitoring

13. Water Resources Management should conduct condition monitoring in Upper East Branch Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

Point Source

14. Barneveld should enter into facilities planing to upgrade its wastewater treatment plant if it exceeds its limits for biochemical oxygen demand (BOD) again (Type C).

15. Dodgeville should undertake facilities planning to address future increased organic and hydraulic loading by the time of its next WPDES permit reissuance (Type B).

LOWER PECATONICA RIVER (SP07)

Management

16. County zoning offices should vigorously enforce shoreland-wetland zoning ordinances (Type C).

Monitoring

17. Water Resources Management should conduct condition monitoring in Lower Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

MIDDLE PECATONICA RIVER (SP08)

Monitoring

18. Water Resources Management should conduct condition monitoring in Middle Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

MINERAL POINT BRANCH/SUDAN BRANCH (SP09)

Monitoring

19. Water Resources Monitoring should conduct remedial action monitoring of Brewery Creek and Furnace Branch as part of basin assessment monitoring effort in the Sugar-Pecatonica rivers basin (Type B).

20. Water Resources Management should conduct condition monitoring on Sudan, Mineral Point and Rock branches, and Pedler Creek as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

Point Source

21. Mineral Point should begin facilities planning for upgrading its wastewater treatment plant in anticipation of Brewery Creek being reclassified as supporting at least a diverse forage fishery (Type B).

LOWER SUGAR RIVER (SP11)

Management

22. County Zoning offices should vigorously enforce shoreland-wetland zoning ordinances (Type C).

Monitoring

23. Water Resources Management should conduct damage assessment monitoring on North Fork Juda Branch to determine the stream's response to the correction of permit violations and unpermitted discharges (Type B).

24. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Lower Sugar River watershed (Type B).

Nonpoint Source

25. The nonpoint source priority watershed selection committee should consider Raccoon Creek a high priority candidate for selection as a small-scale priority watershed project (Type B).

LOWER MIDDLE SUGAR RIVER (SP12)

Management

26. Water Resources Management, with the assistance of Water Regulation and Zoning, should investigate whether it's desirable and feasible to abandon the mill race on the Sugar River at Brodhead to return to a stream environment. (Type B).

Point Source

27. The village of Albany should undertake an operations and needs review of its facility to determine if it is adequate or if the village needs to go through facilities planning to upgrade the wastewater treatment system (Type C).

ALLEN CREEK AND MIDDLE SUGAR RIVER (SP13)

Management

28. Water Resources Management, Water Regulation and Zoning, and Fisheries Management, along with the village of Albany, should assess the feasibility and desirability of removing the dam creating Albany Lake (Types B,C).

Monitoring

29. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Allen Creek and Middle Sugar River watershed (Type B).

Nonpoint Source

30. The nonpoint source priority watershed selection committee should consider Gill, Liberty, and Ross Crossing creeks high priority candidates

for possible selection as small-scale nonpoint source priority watershed projects (Type B).

Point Source

31. Evansville should undertake facilities planning to address where it exceeded state groundwater standards if it continues to be a problem (Type B).

32. The village of Brooklyn should adopt a construction site erosion control/stormwater management ordinance (Type C).

LITTLE SUGAR RIVER (SP14)

Management

33. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Little Sugar River watershed (Type B).

34. The village of New Glarus should identify opportunities and take measures to protect the Little Sugar River such measures as enacting and enforcing a stormwater management ordinance, improved enforcement of construction site erosion control provisions, and acquisition of parkland and natural areas adjacent the Little Sugar River and along drainageways leading to the river (Type C).

UPPER SUGAR RIVER (SP15)

Management

35. Water Resources Management and/or Water Regulation and Zoning should remove the dam on the Sugar River at Paoli, if feasible (Type B).

36. The University of Wisconsin should conduct a study of the long-term impact of golf course operation on the water quality and aquatic life of Morse Pond, as requested by the DNR in 1990 (Type C).

37. The cities of Madison and Verona, and Dane County should enact **and strictly enforce** strong stormwater management ordinances and long-range land use planning to protect the water quality, in-stream habitat and fisheries of Badger Mill Creek and the Sugar River (Type C).

38. DNR's Bureau of Wastewater Management, through the stormwater permitting process, should take measures to assure that the city of Madison adequately addresses water quality problems affecting Badger Mill Creek and, potentially, the Sugar River (Type B).

Monitoring

39. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Upper Sugar River watershed (Type B).

40. Water Resources Management should establish an ambient monitoring station on the Sugar River above the present Verona wastewater treatment plant outfall (Type B).

Nonpoint Source

41. The nonpoint source priority watershed selection committee should consider the Upper Sugar River watershed a high priority candidate for possible selection as a nonpoint source water pollution abatement program priority watershed project (Type B).

Point Source

42. DNR and Dane County should address and implement any recommendations coming out of the regional groundwater hydrology study for the Sugar River Basin (Type C).

WEST BRANCH SUGAR RIVER/MOUNT VERNON CREEK (SP16)

Management

43. The village of Mount Horeb, with the assistance of the Dane County Regional Planning Commission, should develop long-range storm water management plans to adequately protect the headwaters areas of the West Branch Sugar River and Deer Creek from degraded water quality resulting from urban development (Type C).

Monitoring

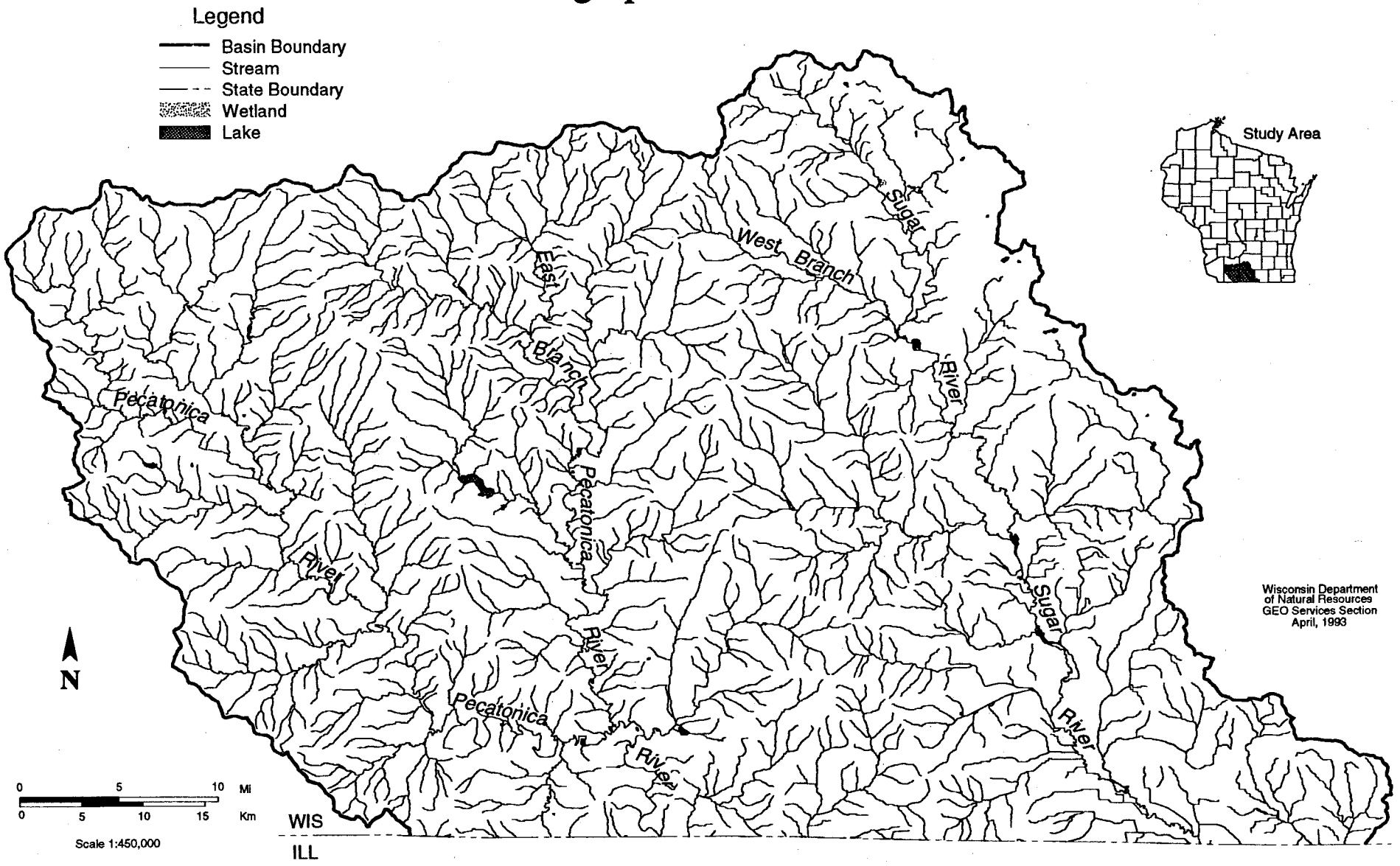
44. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the West Branch Sugar River and Mt. Vernon Creek watershed (Type B).

Nonpoint Source

45. The nonpoint source priority watershed selection committee should consider the West Branch Sugar River and Mt. Vernon Creek watershed a high priority candidate for possible selection as a nonpoint source water pollution abatement program priority watershed project (Type B).

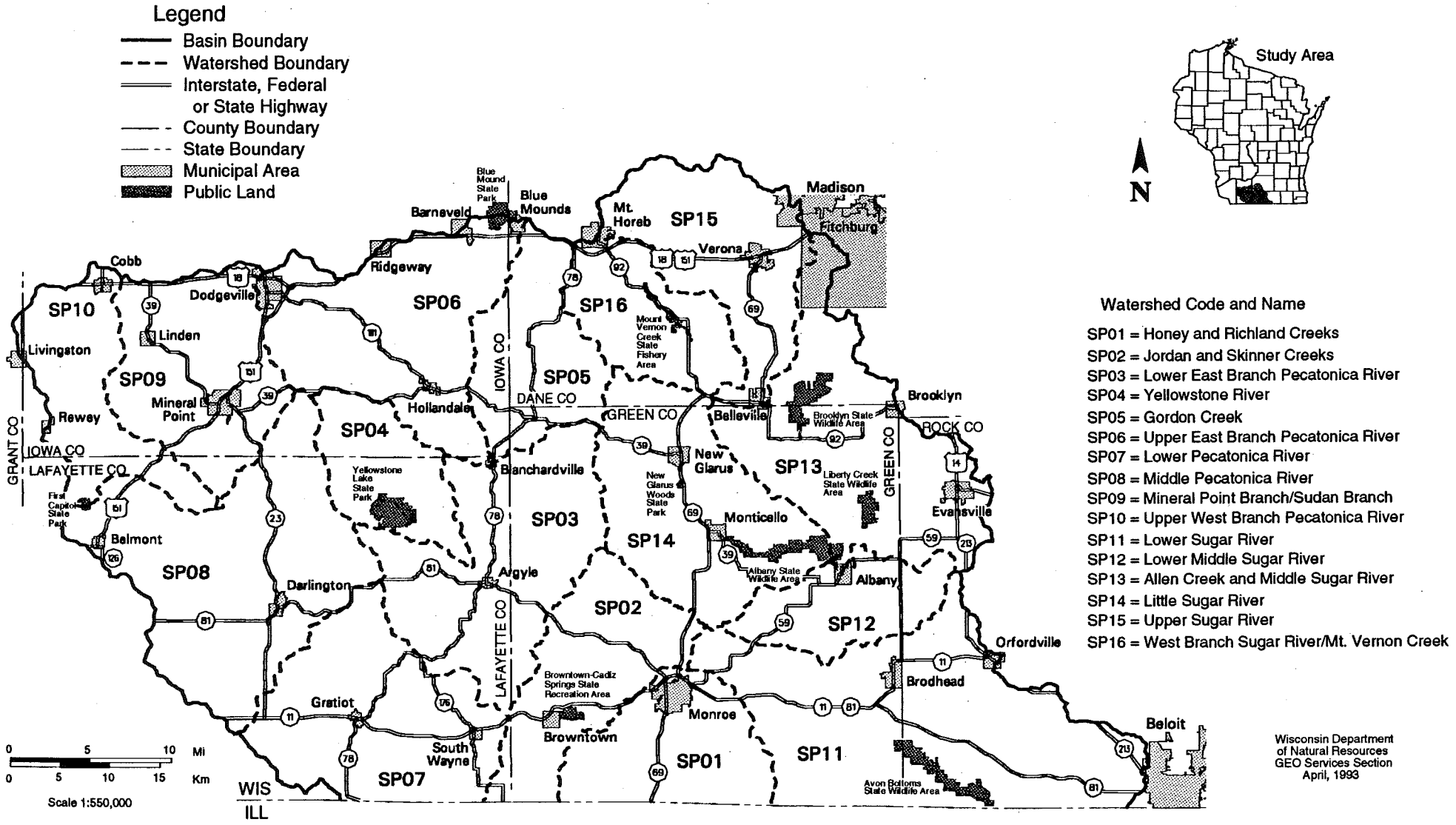
The Sugar-Pecatonica River Basin

-Geographical Features-



The Sugar-Pecatonica River Basin

-Cultural Features-



Watershed Code and Name

SP01 = Honey and Richland Creeks
SP02 = Jordan and Skinner Creeks
SP03 = Lower East Branch Pecatonica River
SP04 = Yellowstone River
SP05 = Gordon Creek
SP06 = Upper East Branch Pecatonica River
SP07 = Lower Pecatonica River
SP08 = Middle Pecatonica River
SP09 = Mineral Point Branch/Sudan Branch
SP10 = Upper West Branch Pecatonica River
SP11 = Lower Sugar River
SP12 = Lower Middle Sugar River
SP13 = Allen Creek and Middle Sugar River
SP14 = Little Sugar River
SP15 = Upper Sugar River
SP16 = West Branch Sugar River/Mt. Vernon Creek

Wisconsin Department of Natural Resources
GEO Services Section
April, 1993

SURFACE WATER QUALITY REPORT

Water quality in the Sugar-Pecatonica River basin is generally fair to good. The primary water quality problems are the result of nonpoint sources of pollution--particularly from agricultural operations and urban runoff--excessive populations of rough fish and hydrologic modifications such as dams, stream straightening, and ditching, draining or other alterations of wetlands. This basin plan update recommends three watersheds be considered **high** priority candidates for possible selection as nonpoint source priority watershed projects: **Gordon Creek (SP05)** in Iowa and Dane counties, and **Upper Sugar River (SP15)** and **West Branch Sugar River (SP16)** in Dane County. Additional streams and their respective sub-watersheds are recommended as **high** priority candidates for selection as small-scale nonpoint source priority watershed project selection: **Raccoon Creek** in Rock County, **Gill, Ross Crossing and Liberty creeks** in Green County, and **Richland Creek** also in Green County.

Our lack of base or recent data is a significant problem for managing the water resources of this basin. We do not have adequate water chemistry, habitat or sediment data to make sound water resources management decisions for many streams, lakes, and flowages in the basin. This basin plan update identifies those streams and watersheds for which we need additional information. Basin assessment monitoring, however, will only fill data holes on some of the most important water resources in the basin.

Data management also hampers our management of the basin. Water resources information is scattered among various electronic and paper files. Basin planning and water resources management would be aided by better data management including a user-friendly, decentralized, computerized water resources database and geographical information system (GIS).

GENERAL INFORMATION

The Sugar-Pecatonica River basin drains approximately 1,860 square miles in southwestern Wisconsin. This includes all or parts of five counties. Major streams in the basin in addition to the Sugar and Pecatonica rivers are the Little Sugar River, East Branch Pecatonica River, West Branch Pecatonica River, Raccoon Creek and Mineral Point Branch.

The basin has more than 1,720 miles of streams. The existing biological use of about 260.6 miles of those streams is cold water sport fishery (trout) waters. Another 517.6 miles are warm water sport fishery waters while 215 miles are considered valuable forage fishery streams. The Department of Natural Resources lacks existing use classification information for more than 706.9 of the total stream miles in the Sugar-Pecatonica River basin. Most of these stream miles are from small, unnamed tributaries or the headwater areas of named streams above the reaches for which DNR has information. The existing biological use or stream classification information for many of the streams is old or sketchy and additional monitoring is needed to update the surface water database. Potential uses are not being met on about 12.5 percent of stream miles in the basin. We estimate another 28 percent of stream miles only partially meet their

potential use. Nonpoint sources of pollution are likely the main factors for the partial attainment of potential biological uses.

The Sugar-Pecatonica basin lies in the "driftless" region of the state, an area not covered by the last glacier. Soils in the driftless region are generally moderately to excessively well-drained mineral soils that have a high mineral content and low organic matter content. Farming occurs on the ridgetops or in the stream valleys with the region's steep hillsides often left wooded. Streams in the driftless region have a higher gradient than those in other parts of southern Wisconsin. Wetlands usually only occur along stream and river margins. While there are some larger wetland complexes along the Pecatonica and Sugar rivers, the percentage of wetland to upland areas in the basin is significantly less than for basins outside the driftless region.

Streams in the Sugar-Pecatonica river basin support several rare fish species that are declining within their range. Effective nonpoint source controls are essential to the protection of these species.

Agriculture predominates land use in the basin, with urbanizing areas closer to Madison. The basin drains the rapidly developing southwest side of Madison. About 10 million people live within a three-hour drive of the basin. Besides portions of the city of Madison, larger municipalities in the basin include Verona, Monroe, parts of Fitchburg, Mt. Horeb, Dodgeville, and Darlington. The proximity to major population centers places often heavy user pressure on aquatic and water related resources.

Dane County Regional Planning Commission

The Dane County Regional Planning Commission (DCRPC) is presently the designated planning agency for water resources in Dane County. This includes all or parts of five watersheds in the Sugar-Pecatonica Basin: Gordon Creek, West Branch Sugar River and Mt. Vernon Creek, Upper Sugar River, Little Sugar River, and Allen Creek and Middle Sugar River watersheds. DCRPC prepared a water quality management plan for Dane County as part of its delegated responsibilities. The *Dane County Water Quality Management Plan* and its updated appendices contain various water resources related recommendations. That plan also describes in more detail than this document the water resources in the Dane County portions of the Sugar-Pecatonica basin. The DCRPC plan should be consulted for proposed projects or actions that may affect water resources.

The this water quality management plan makes further recommendations for actions the DNR intends to undertake or would like to see completed in the Dane County watersheds depending upon resources available.

THE LAKES ELEMENT

All lakes are important as valuable natural resources, but DNR's ability to manage all of them is limited. A general description of the physical setting of lakes in the Sugar-Pecatonica River basin can be found in Table 1 below. Some lakes will have narratives and specific management recommendations. These will be found in the watershed narrative portion of this report.

The Sugar-Pecatonica River basin has few lakes. Almost all the lakes in the basin are impoundments of streams. These impoundments were often created to provide water power to drive small grist mills, although the more recent ones were created to provide recreational and/or residential opportunities. Impoundment lakes typically have a large drainage area to lake area ratio. They are usually shallow and subject to rapid sedimentation. Six water quality problems frequently limit recreational use of millponds: turbidity, excessive rooted aquatic plants and attached algae, free floating bluegreen algae, roughfish, water level fluctuation and winterkills (Marshall, 1988). These water quality problems, coupled with the generally small size of the lakes, limit uses of the lakes.

THE LAKE MANAGEMENT PROGRAM

DNR's Lake Management Program is responsible for protecting and maintaining Wisconsin's lakes to provide a full complement of lake uses for all citizens. With almost 15,000 inland lakes to manage, the Lake Management Program shares responsibility for taking lake protection action with University of Wisconsin-Extension, local units of government, lake districts and associations, and lake-specific conservation and community groups. It acts as a catalyst to help produce the greatest benefit from coordinated action of the 20 or so DNR programs that affect lakes. A major goal is ensuring an adequate water quality database exists so present and future management programs are soundly developed.

Presently, there are seven sub-programs administered by the DNR Lakes Management Program that directly affect lakes across the state, as well as in the Sugar-Pecatonica River Basin. They include:

* Self-Help Monitoring
* Long-Term Trend Monitoring
* Aquatic Plant Management Program
* NR 119 - Lake Planning Grants
* Priority Lake Projects (Nonpoint Source)
* Environmental Protection Agency (EPA) Clean Lakes Grants
* Lake Protection Grant Program (NR 191)

The following are brief descriptions of these programs:

The **Self-Help Monitoring Program** gives citizens an active role in lake management activities and assists the DNR with basic data collection. The self-help volunteers are trained by a DNR lake management specialist to measure water clarity, and monitor

levels on some lakes. More than 300 volunteers statewide participated in the program during 1990. No lakes in the Sugar-Pecatonica basin are in this program.

The DNR conducts intensive monitoring on 50 lakes statewide five times per year for the **Long-Term Trend Monitoring Program.** Water chemistry and biological and physical conditions will be monitored for about 10 years (the program began in 1986) to evaluate trends in lake water quality. Chemical data will be supplemented by surveys of aquatic plants, fish, bottom-dwelling invertebrates, land use practices in the watershed, weather, and physical setting. In addition, historical data, if available, will be used to develop reports on each of the 50 lakes. Long-term trends monitoring is not being conducted on any lake in this basin.

Under NR 107, the **Aquatic Plant Management Program** (APM) regulates the use of chemical herbicides for the control of aquatic plants and algae in Wisconsin lakes and other waterbodies. This program provides permits for applying herbicides to aquatic sites to abate nuisances caused by excessive plant growth, and ensures that the public is informed of herbicide treatments. The objective of the permit procedure is to preserve the ecological benefits of lake plant communities, including fish and wildlife habitat, erosion prevention, and water quality maintenance. The program also disseminates information about the benefits of aquatic plants and alternative methods of control. Finally, the program regulates other chemical treatments of lakes for management purposes.

This basin plan identifies lakes that should be the highest priorities for designation of sensitive areas under the APM program. Sensitive areas are areas of aquatic vegetation offering critical or unique fish and wildlife habitat, water quality protection, or erosion control benefits to a lake. These areas are cooperatively designated by district water resources, fisheries, wildlife, and water regulation staff. Generally, APM permits are not granted for treatment of sensitive areas. Sensitive area designation may also affect the issuance of Chapter 30 permits by the Bureau of Water Regulation and Zoning.

There is virtually no data on any lakes in the Sugar-Pecatonica basin that can be used to identify sensitive areas on lakes. Only one lake in the basin received an APM permit in 1992, Lake Montesian at Monticello.

NR 119 - Lake Planning Grants are available to lake districts, lake associations, counties, cities, villages, or towns, for collection of baseline data to provide information on the quality of water in lakes, delineation of watershed boundaries, land use practices within a lake's watershed, definition of local zoning and government authority to control pollution sources, or acquisition of sociological information important to long-term management of the lake. Projects chosen will be awarded up to $10,000 with a 25 percent local cost share.

Lakes that have been designated in this plan as Outstanding Resource Waters, either Class IA (phosphorus sensitive), Class IB and/or Class IIA, and which are affected by nonpoint sources of pollution can be candidates to become **Small-Scale Nonpoint Source Priority Watershed projects.** These priority lakes projects will implement best management practices on lakes with documented water quality problems or threatened water quality as a result of nonpoint sources of pollution. The best management practices will be implemented on those lakes which have potential for improvement

through a decrease in nutrient loading, or which need to be protected from further degradation.

The Lakes Management Program acts as liaison with the U.S. Environmental Protection Agency (EPA) for the federal **EPA Clean Lakes Grant Program**. Clean Lakes provides cost-sharing grants for the planning and implementation of lake protection and restoration projects for individual lakes. The awards are competitive and typically for 50 percent of the cost of the project. Phase I grants cover diagnostic and feasibility studies while Phase II grants cover implementation work. Wisconsin has the opportunity to apply for grants on behalf of local project sponsors each year. District Water Resources Management is responsible for selecting and developing projects to be submitted to EPA. Applications are then coordinated and finalized by the lakes management program. Successful applications are administered jointly by central office and district staff.

Lake Protection Grants (NR 191) provide up to $100,000 in matching grants to eligible units of government. Eligible activities include the purchase of land or easements where it can be demonstrated that this action will significantly contribute to the protection of the natural ecosystem and water quality of a lake. Also included is the restoration of wetlands or the lands draining to wetlands and the development of regulations and ordinances to protect lakes and educational activities necessary for implementation.

MONITORING NEEDS

The lack of a lake water quality database is perhaps the most serious problem lake managers face. The physical and chemical data used to identify phosphorus, mercury and acid sensitivity is inadequate for most lakes in the basin. Due to these insufficiencies, lakes requiring nonpoint source controls cannot be identified, nor can those which may be mercury sensitive, or which need protection. Without data collected according to modern water quality standards, proper management of these lakes cannot occur.

The Self-Help Monitoring Program is one means of acquiring information. Efforts to expand lake self-help programs should focus on lakes where lake management organizations exist and little water quality data is available.

HOW TO USE THE LAKE TABLE

The following explains the information used in the lake tables.

LAKE NAME: All named and unnamed lakes greater than 10 acres are listed. Lake names are those found on U.S. Geological Survey (USGS) quadrangle maps unless the Wisconsin Geographic Names Council has established a different name. Some lakes are known locally by other names. Where available, those names have been listed along with the lake's official name.

AREA: The surface area is the size of the lake, in acres, as listed on the DNR Master Waterbody File.

MAX DEPTH: Maximum depths are those listed in "Wisconsin Lakes," DNR.

COUNTY: Lists the county in which the lake occurs.

PHOSPHORUS SENSITIVITY: The purpose of this analysis is to classify lakes according to their relative sensitivity to phosphorus loading and existing trophic condition. The screening identifies high quality lakes that should receive highest priority for nutrient control management. The analysis first separates lakes into two major categories; lakes that are sensitive to increased phosphorus loading (Class I) and lakes less responsive to changes in phosphorus loading (Class II). Lakes in each general classification are then subdivided into management groups based on data needs or existing water quality conditions.

Class I:
- A= existing water quality fair to excellent; potentially most sensitive to increased phosphorus loading.
- B= existing water quality poor to very poor; less sensitive to increased phosphorus loading than Group A.
- Ins= data inadequate or insufficient to assess trophic condition; classification monitoring recommended.
- D= stained, dystrophic lake, or aquatic plant-dominated lakes.

Class II:
- A= existing water quality fair to excellent; may not be as sensitive to phosphorus loading as Class I lakes
- B= existing water quality poor to very poor; low sensitivity to increased phosphorus loading
- Ins= data inadequate or insufficient to assess trophic condition
- D= stained, dystrophic lake, or aquatic plant-dominated lakes.

These classification groups are used to establish appropriate management recommendations and priorities.

WINTER KILL: Shallow lakes and impoundments often suffer from winterkill which limit the fisheries of affected lakes.

CURRENT FISH ADVISORY: Numerous lakes in Wisconsin contain fish with elevated levels of mercury. Fish consumption advisories are issued semi-annually for lakes with fish mercury levels of 0.5 ppm or greater. Generally, predator fish from soft water, poorly buffered, low Ph lakes have the highest concentrations of mercury.

Groups:
- A,B determine adequacy of existing information and identify additional monitoring needs to verify or expand existing information.
- C fish mercury monitoring recommended, priority based on public use.

ALKALINITY (ALK): This refers to a measure of the water hardness in the lake.

APM MONITORING: This column identifies lakes with aquatic plant management issues.

MONITORING: These columns identify existing or recommended monitoring:

SH = Self-Help Lake Monitoring Volunteer
LTTM = Long-Term Trend Monitoring Lake
APM = Algae and/or weed problem
Hg = Fish tissue mercury monitoring
TS = Trophic status monitoring
SED = Bottom sediment monitoring for toxins
IM = Inventory monitoring (update Surface Water Inventory)

The following letters in each column signify that monitoring is:

R = recommended X = completed C = currently being done

COMMENTS: Additional information that was available for the lakes has been identified in the narrative for those lakes with an N in this column.

Table 1. Lake Management Summary Table

NAMED LAKES >= 10 ACRES SUGAR PECATONICA BASIN

LAKE NAME (T-R-S)	AREA ACRES	MAX DEPTH FEET	County	P SEN	CLASS	HIST OF WINT KILL 1=YES 2=NO	CURRENT FISH ADV SEVERE PARTIAL	ALK OR ANC (MG/L)	APM PROB SEVERE MOD.	Monitoring sh	lttm	hg	ad	ts	feas	im	Narr/N
HARRIETT LAKE	32	12	Dane	2	2C	1		44									
L BELLE VIEW(BELLEVILLE MLPD)	100	7	Dane	2	2C	2		252	severe								N
ALBANY LAKE (MILLPOND)	102	8	Green	2	2C	2		291									N
DECATUR LAKE	151	10	Green	2	2C	2		274	severe								
LEOTA LAKE	41	15	Rock	2	2C	1		250	severe								
BECKMAN LAKE	69	12	Green	2	2C	2		171									
LUDDEN LAKE	58	14	Iowa	2	2C	2		163									N
HORSESHOE LAKE	26	3	Lafayette	2	2C			114									
UNNAMED T02N R05E S10-11	32	2	Lafayette	2	2C	1		0									
YELLOWSTONE LAKE	455	21	Lafayette	2	2C	2		207		R							N
MORSE POND	10	6	Dane							R							N

NONPOINT SOURCE ELEMENT

The nonpoint source program, as established in Administrative Code NR 120, sets up a new procedure for selecting priority watershed projects for abating water quality problems caused by polluted runoff. High priority watersheds will be identified through the water quality management plan as potential large-scale, small-scale and priority lake projects by using the selection process and criteria described below. The criteria are used to rank streams, lakes and groundwater separately, by watershed, to determine the need and value of conducting corrective projects. The ranking identifies priority watershed areas where:

* Nonpoint sources of pollution exist.
* The polluted runoff affects water quality or is a threat to water quality.
* The problem can be controlled and/or corrected through best management practices.

A list of high-priority projects, based on the water quality rankings, will be provided to the district advisory committee for review. The advisory selection committee will compare high-priority projects and then rank the high-priority projects for the year based on district workload and priorities, county ability to manage a project, and landowner willingness to participate.

SUMMARY OF WATERSHED RANKING CRITERIA AND PROCESS

Stream Evaluation

Streams which have the potential to improve and/or be protected if nonpoint source controls are implemented are ranked. If the stream does not have the potential to improve it will be ranked low.

Criteria are established to determine the extent of water quality problems. A series of yes/no questions address the appropriate criteria to determine the presence of water resource problems and/or threats and the probability of a positive response to nonpoint source controls. If a water quality problem is identified and supported by data, and has the potential for improvement, the stream receives a high ranking. Criteria include questions regarding endangered resources, the fishery, water chemistry, macroinvertebrates, vegetation, and physical habitat. Medium and low rankings have data supporting them although the water quality problem is not as severe as high ranking streams. A stream without data is ranked low.

Threatened streams are rated high. The determination that a stream is threatened requires an interpretation of the available data to discern downward trends and/or the beginning of use impairments.

To receive a watershed stream rating, at least 50 percent of the total perennial, named and unnamed stream miles must be rated based on data, as defined above. Only the unnamed streams longer than five miles are included. Watersheds with insufficient data are not ranked and a monitoring recommendation may be made. Each perennial named or unnamed stream in the watershed receives a rating.

Streams ranked **high** that are eligible for a small-scale priority watershed project are listed in Table 2.

Lake Evaluation

The lakes evaluation as a component of the nonpoint source watershed ranking is based on the Lakes Report guidance, which classifies lakes based on sensitivity to phosphorus loading. A series of yes/no questions determine the presence of water resource problems and/or threats and the probability of a positive response to nonpoint source controls.

Class 1A lakes are characterized as deeper lakes that stratify with excellent water quality. These lakes are extremely sensitive to phosphorus loading. If a lake is a Class 1A or Outstanding Resource Water (ORW) and is threatened by nonpoint sources, it receives a high ranking (ORW lakes have been nominated but not yet incorporated into NR 207). It is extremely important to prevent water quality degradation in these waterbodies by understanding the warning signs of future problems.

A lake is ranked high if it is classified 1B or 2A with documentable water resource problems and/or threats related to nonpoint sources of pollution, has the **potential for a positive response** to control measures and/or the water quality will be **protected** by implementation of control measures. A lake classified as 1B exhibits poor to very poor water quality; it is a deeper lake that stratifies. Class 2A lakes are generally shallow in comparison to Class 1 lakes and do not stratify. Their water quality is fair to excellent.

The ranking process repeats for high resource and high recreational use lakes, using different criteria. These lakes must have a documented water resource problem and/or threat which is related to nonpoint source pollution, and the potential for a response. These lakes are ranked medium unless extensive data shows it would respond positively to nonpoint source controls, in which case it would receive a high ranking.

The ranking process is similar to stream ranking except that acres of high, medium or low are used instead of miles. No ranking is assigned if less than 50 percent of the total lake acres in the watershed have adequate data.

Because the Sugar-Pecatonica Rivers basin is in the driftless region of Wisconsin, there are few lakes. One watershed, the Yellowstone River Watershed, has a lake as its primary water resource. Yellowstone Lake ranked "medium" in the nonpoint source lake evaluation. It is a lake with high recreational use in a region of the state with few lakes. The lake's potential response to implementation of nonpoint source best management practices has not been modeled. It is, however, believed the lake would respond positively to implementation of such practices.

Groundwater Evaluation

The groundwater evaluation differs from the surface water evaluation primarily due to the lack of established ambient groundwater monitoring programs similar to those of the lakes and streams programs.

This evaluation makes a general inference about the groundwater quality in the area and

will not be the guide to specific groundwater studies.

The evaluation of the groundwater in a watershed is a separate component of the nonpoint source watershed ranking and is based on the following three criteria. The score is determined by:

1. The use of the groundwater contamination susceptibility map.
2. The potential for groundwater quality improvement through the use of nonpoint source controls.
3. Data documenting the groundwater problems created by nonpoint source pollutants such as nitrates or pesticides.

No watershed was ranked for nonpoint source problems in groundwater due to insufficient information.

SMALL-SCALE PROJECTS AND PRIORITY LAKE PROJECTS

Small-scale priority watershed projects are appropriate when nonpoint source-based water resource problems are limited to an individual lake, stream or groundwater area of concern with a limited geographic area. Priority lake projects generally include only the lake and its drainage basin.
Large-scale watershed evaluations can only be selected in watersheds that are fully evaluated. They are usually the most effective approach to widespread nonpoint source pollution problems. In cases where there is insufficient data to select a large-scale project, small-scale projects and priority lake projects can be proposed to correct problems in smaller geographic areas within the larger watershed.

WATERSHED RANKINGS

All watersheds and their streams, lakes and groundwater rankings are shown below in Table 2. These three rankings determine if a watershed can be proposed as a large-scale project due to a high ranking for stream, lakes and/or groundwater.

Four watersheds are recommended as **high** priority candidates for possible priority watershed project selection: **Upper Sugar River, West Branch Sugar River, Yellowstone River and Gordon Creek** watersheds.

The small or sub-watersheds recommended for possible selection as small-scale priority watershed projects are: **Raccoon Creek** sub-watershed including East Fork Raccoon Creek in Rock County, and **Gill Creek, Liberty Creek, Ross Crossing Creek and Richland Creek** in Green County.

In Table 2, watersheds that have not been ranked are identified as "**NR**". The "NR" in the stream column indicates that we had data for less than 50 percent of the named stream miles had data or information, and thus could not rank them. An "**NR**" in the lakes column indicates that there were not any, or enough, lakes larger than 25 acres in the watershed.

Candidates for small-scale stream projects are listed in Table 3.

Table 2. Nonpoint Source Watershed Rankings

Watershed Name	Watershed Number	Stream Rank	Groundwater Rank	Lake Rank
Honey and Richland Creeks	SP01	M		NR
Jordan and Skinner Creeks	SP02	NR		NR
Lower East Branch Pecatonica River	SP03	(Ongoing Priority Watershed Project)		
Yellowstone River	SP04	H		M
Gordon Creek	SP05	H		NR
Upper East Branch Pecatonica River	SP06	NR		NR
Lower Pecatonica River	SP07	NR		NR
Middle Pecatonica River	SP08	NR		NR
Mineral Point and Sudan Branch	SP09	NR		NR
Upper West Branch Pecatonica River	SP10	(Prior Priority Watershed Project)		
Lower Sugar River	SP11	L		NR
Lower Middle Sugar River	SP12	NR		NR
Allen Creek and Middle Sugar River	SP13	M		NR
Little Sugar River	SP14	NR		NR
Upper Sugar River	SP15	H		NR
West Branch Sugar River	SP16	H		NR

H - High Priority
M - Medium Priority
L - Low Priority
NR- Not Ranked

Table 3. Potential Small-Scale Projects Based on High Ranking Streams

Watershed Name	Watershed Number	High Ranking Streams
Honey and Richland Creeks	SP01	Richland Creek
Lower Sugar River	SP11	Raccoon Creek
Allen Creek and Middle Sugar River	SP13	Gill Creek Ross Crossing Creek Liberty Creek

HOW TO USE THE RIVER AND STREAM TABLES

The following information is included in the river and stream tables.

Name of Stream: All named streams and some unnamed streams are listed. Stream names are those found on U.S. Geological Survey (USGS) quadrangle maps unless the Wisconsin Geographic Names Council established a different name. Unnamed streams are identified by location of the stream mouth as indicated by township, range, section and quarter-quarter section.

Length: Stream length is either the total length of the stream, or the starting and ending mile of the portion of the stream described, based on data from the Fish Distribution Study conducted by the Bureau of Research (DNR Research Report 126, 1984). The stream mile at the stream mouth is zero ("0") and increases as one moves upstream.

Existing Use: This column indicates the existing biological use supported by the stream as defined in NR 102(04)(3) under fish and aquatic life uses. If the existing use is unknown,leave a blank space, which indicates the existing use is unassessed. The following abbreviations for stream uses are used in the tables:

COLD; Cold Water Communities; includes surface waters capable of supporting a community of cold water fish and other aquatic life or serving as a spawning area for cold water fish species. This use includes, but is not restricted to, surface waters identified as trout waters in the publication (6-3600[80]) *Wisconsin Trout Streams*.

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

WWFF; Warm Water Forage Fish Communities; includes surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

LFF; Limited Forage Fish Communities; includes surface waters of limited capacity because of low flow, naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of forage fish and aquatic life.

LAL; Limited Aquatic Life; includes surface waters severely limited because of very low or intermittent flow and naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of aquatic life.

The table also includes the "class" of trout streams based on "Wisconsin Trout Streams" [DNR Publ. 6-3600(80)] and Outstanding/Exceptional Resource Waters, Wisconsin Administrative Code NR 102.10 and NR 102.11.

Class I streams are high-quality streams where populations are sustained by natural reproduction.
Class II streams have some natural reproduction but need stocking to maintain a desirable fishery.

Class III streams sustain no natural reproduction and require annual stocking of legal-size fish for sport fishing. The approximate length or portion of stream meeting each of the use classes is indicated.

Potential Use: This column indicates the biological use, and trout stream class, a stream or stream segment could achieve if it was well managed and pollution sources were controlled. In many cases potential use is the same as the existing use classification. In other streams potential use may be higher than the existing use. Abbreviations are the same as those used in the existing use columns. The sources of information are indicated by footnotes on each table. The classification for trout streams came from "Wisconsin Trout Streams" [DNR Publ. 6-3600(80)], Wisconsin Administrative Code NR 102.10 and NR 102.11 and the professional judgments of area Fish Managers. If the potential biological use is unknown, a blank space indicates the potential biological use is unassessed.

Supporting Potential Use: This column indicates whether a stream is threatened, or is fully, partially, or not meeting its potential biological use. An entry in any of the columns indicates the relationship between actual stream use and potential use. For example, if the entire length of a stream is listed under the "Fully" column, the stream has no problems which can be controlled. When a portion or all of a stream length is listed under another heading, the stream is affected or threatened by some manageable factor and the biological use of the stream can probably be improved. If use support is unknown a blank space indicates it is unassessed.

Assessment Category/Monitored or Evaluated: It is important to detail what information was used to derive a potential biological use designation and the degree to which a stream meets that potential use. If the potential use decision was based upon site-specific data, then "M," for monitored, is entered. If the decision is based on information other than site-specific data (citizen complaints, best professional judgment of a biologist or fish manager) then "E," for evaluated, is entered. "Evaluated" includes decisions based on data more than five years old.

Stream Classification (water quality standard designation): This column indicates the formal stream classification of a particular stream. All state waters are classified as one of the following:

Fish and Other Aquatic Life Use Waters: All surface waters are classified into one of the following fish and other aquatic life subcategories. Only the first three are considered suitable for the protection and propagation of a balanced fish and other aquatic life community. The last two are not capable of supporting a balanced community because of naturally limited habitat or water quality. These limited forage fishery and limited aquatic life waters are listed in NR104 if they receive a permitted point source discharge.

Cold Water Communities (COLD) are capable of supporting a community of cold water fish and other aquatic life. This classification includes all the streams referenced in the Wisconsin Trout Streams publication.

Warm Water Sport Fish Communities (WWSF) are capable of supporting a community of warm water sport fish or of serving as a spawning area for warm water sport fish.

Warm Water Forage Fish Communities (WWFF) are capable of supporting an abundant diverse community of forage fish and other aquatic life.

Limited Forage Fishery (LFF) communities capable of supporting only a limited community of forage fish and aquatic life.

Limited Aquatic Life (LAL) communities capable of supporting only a limited community of aquatic life.

Great Lake Communities consist of the waters of Lakes Michigan and Superior, including Green Bay and all arms and inlets, as well as tributaries to these waters which serve as a spawning area for migratory fish species. These waters have their own category because of their unique characteristics. Also, they will receive special protection from the impacts of toxic substances under the new antidegradation rules.

Note: Any water that is not formally classified is assumed by the Federal Clean Water Act to meet the Clean Water Act goals of supporting a balanced warm-water fish and other aquatic life community and will appear in the table as **DEF**.

Outstanding Resource Waters (ORW) have the highest quality water and fisheries in the state and are therefore deserving of special protection. No discharge is allowed to these waters unless the quality of the wastewater discharged is equal to or better than background conditions. These streams are listed in NR 102.

Exceptional Resource Waters (ERW) have excellent water quality and valued fisheries but already receive discharges. In some cases, new discharges to exceptional waters may be allowed to correct an environmental or public health problem. These streams are listed in NR 102.

There are now two miles of ORW waters and 190.3 miles of ERW waters in the Sugar-Pecatonica basin. Waterbodies in the basin that have been identified as outstanding or exceptional resource waters are identified in each watershed's stream table.

Use Problems, Source/Impact: This column indicates the probable sources of pollution in the stream and the types of water quality problems present (impact). Some streams shown as fully meeting potential use may still show up in this column as having a use problem. When this occurs it may mean there is a problem but it cannot be managed for some reason, or there is a potential threat to the use. These situations are explained in the narrative or in the references.

Following is a key to the abbreviations in the watershed tables:

Source (cause of problem)

BDAM - Beaver dam
CM - Cranberry marsh
DCH - Ditched
DRDG - Dredging
GR.Pit - Gravel Pit Washing Operation
HM - Hydrologic modification
IRR - Irrigation
LF - Landfill
NMM - Non-metallic mining
NPS - Unspecified nonpoint sources

BY - Barnyard or exercise lot runoff
CL - Cropland erosion
CON - Construction site erosion
PSB - Stream bank pasturing
PWL - Woodlot pasturing
RS - Roadside erosion
SB - Stream bank erosion
URB - Urban stormwater runoff
WD - Wind erosion

PSM - Point source, municipal treatment plant discharge
PSI - Point source, industrial discharge
SS - Storm sewer

Impact (effect or impact of source on a stream)

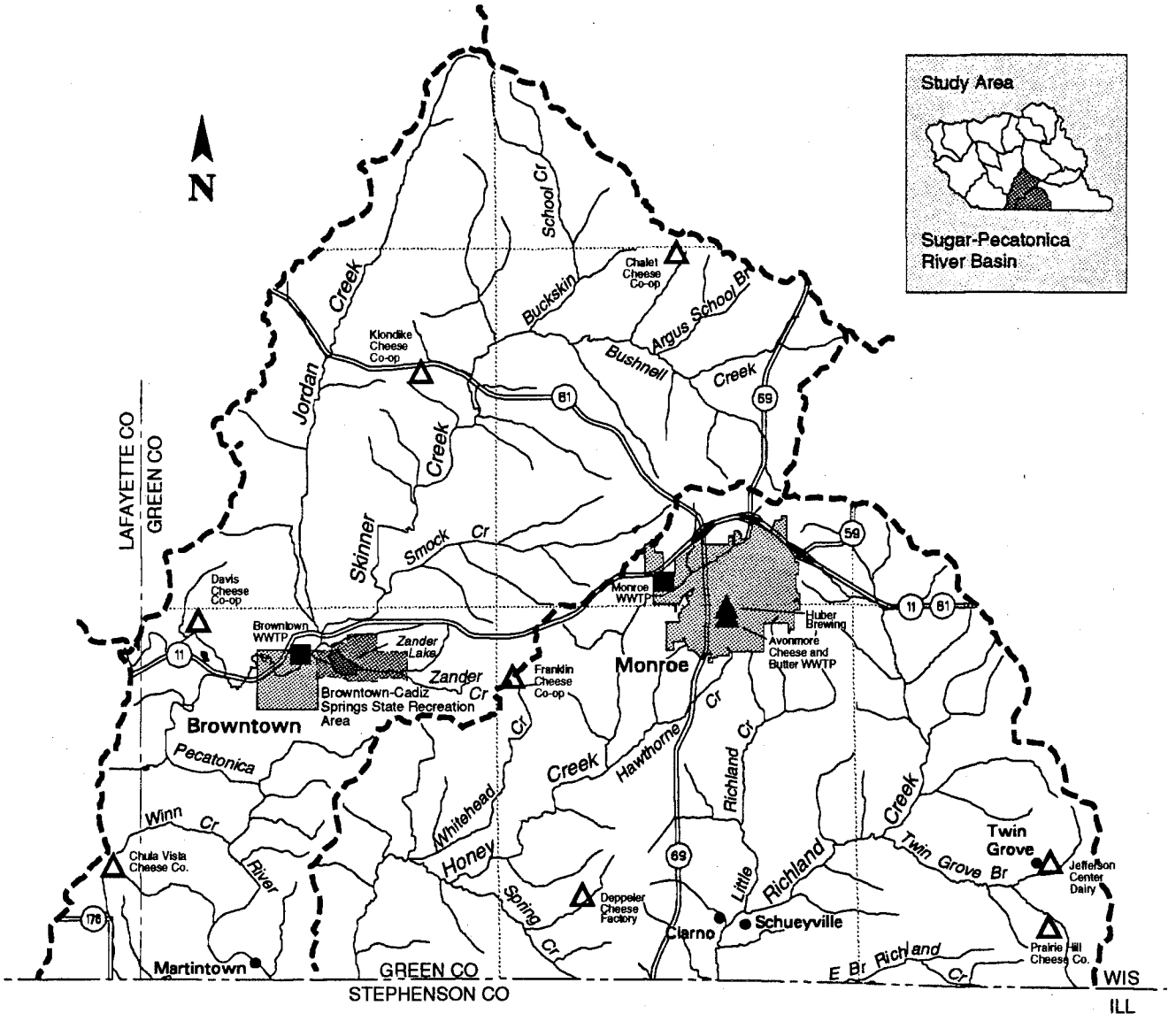
BAC - Bacteriological contamination
CL - Chlorine toxicity
DO - Dissolved oxygen
FAD - Fish advisory
FLOW - Stream flow fluctuations caused by unnatural conditions
HAB - Habitat (lack of cover, sedimentation, scouring, etc.)
HM - Heavy metal toxicity
MIG - Fish migration interference
NH^3 - Ammonia toxicity
NUT - Nutrient enrichment
ORG - Organic chemical toxicity or bioaccumulation
PCB - PCB bioaccumulation
pH - pH (fluctuations or extreme high or low)
PST - Pesticide/herbicide toxicity
SC - Sediment contamination
SED - Sedimentation
TEMP - Temperature (fluctuations or extreme high or low)
TOX - General toxicity problems
TURB - Turbidity

Narrative/Recommendations: Indicate if there is a narrative or if there are monitoring or management recommendations relating to the stream by marking this column. Mark the column with an "N" if there is only a narrative. Mark the column with an "R" if there are recommendations plus a narrative.

NPS Rank: This column lists how each stream ranked in the nonpoint source assessment for priority watershed selection.

References: The reference material used to complete the table for each stream is indicated by a number. A corresponding list of references is provided at the end of this report.

Honey and Richland Creeks (SP01) and Jordan and Skinner Creeks (SP02) Watersheds



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:

- Surface Water
- Groundwater
- Both

Industrial Discharge to:

- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:180,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

HONEY AND RICHLAND CREEKS (SP01)

The Honey and Richland Creeks watershed in south central Green County is primarily agricultural. Basin assessment monitoring of some of the streams in the watershed indicates that agricultural nonpoint source pollution is a problem.

The only municipal wastewater discharger to surface water is the city of Monroe, which discharges to Honey Creek. Four industrial facilities discharge to surface water in the watershed.

RECOMMENDATIONS

Management

1. The city of Monroe should develop a sewer service area plan by the time of its next Wisconsin Pollutant Discharge Elimination System (WPDES) permit reissuance to assist the city in planning and guiding growth (Type C).

Monitoring

2. The Bureau of Water Resources Management (WRM) should conduct condition monitoring in Honey and Richland Creeks watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

3. WRM should conduct Hilsenhoff biotic index and habitat assessment monitoring of Honey Creek to determine what effects, if any, the Monroe wastewater treatment plant has on in-stream habitat (Type B).

Nonpoint Source

4. The nonpoint source priority watershed selection committee should consider Richland Creek a high priority candidate for possible selection as small-scale nonpoint source priority watershed project (Type B).

East Branch Richland Creek

This stream rises in Green County near the state line and flows to Richland Creek in Illinois. The Ozark minnow, a threatened fish species, has been found in the creek. Hilsenhoff Biotic Index (HBI) monitoring from 1988 indicates the stream has good water quality stream (DNR, 1993[1]).

Honey Creek

Honey Creek rises on the west side of the city of Monroe. The Monroe wastewater treatment plant discharges to the stream. Monitoring done by Monroe indicates no significant problems (DNR, 1993 [26]), although biotic index monitoring and habitat assessment monitoring needs to be done. Urban nonpoint sources of pollution, including increased runoff from urban impervious surfaces such as pavement, are also believed to cause bank erosion and sedimentation problems in the creek.

Richland Creek

Richland Creek supports a warm water sport fishery and is considered the best smallmouth bass stream in Green County. It is also classified as an Exceptional Resource Water for its entire reach in Green County. The upper reach of the creek has poor in-stream habitat due to agricultural nonpoint source pollution and urban stormwater runoff, although 1988 Hilsenhoff biotic index monitoring indicated fair to good water quality(DNR, 1993[1]).

Table 4. Honey and Richland Creeks (SP01) COUNTIES: Green SQUARE MILES: 78

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
E. Br. Richland Creek	3	WWFF/3°1	same	part-3	M	DEF	NPS,HM/HAB,SED	N	M	1,4,15,28
Hawthorne Creek	3	WWFF/3°	same	part-3	E	DEF	NPS/SED		NR	28
Honey Creek	16	WWSF/16°	same	part-16	E	WWSF	NPS,PSM/HAB	N/R	M	1,26,28
Little Richland Creek	7	WWFF/7°	same	part-7	M	DEF	NPS,HM/HAB,SED		M	1,4,28
Richland Creek	14	WWSF/14°	same	part-14	M	ERW	NPS,HM/HAB,SED	N	H	1,2,4,28
Spring Creek	4	WWFF/4°	same	part-4	M	DEF	NPS,HM/HAB,SED		M	1,4,28
Thunder Branch	3	LFF/3°	same	full-3	E	LFF			NR	28
Twin Grove Branch	6	WWFF/6°	WWSF/6	Not-6	M	DEF	NPS,HM/HAB,SED		H	1,4,28
Whitehead Creek	5	WWFF/5°	same	part-5	M	DEF	NPS,HM/HAB,SED		L	1,4,28
Unnamed streams (28)	28					DEF				
SUBTOTALS		COLD/0 WWSF/41 WWFF/17 LFF/3 LAL/0 UNK/28	COLD/0 WWSF/41 WWFF/17 LFF/3 LAL/0 UNK/28							

TOTAL STREAM MILES: 89

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. (Note to planner: these are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update).
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

JORDAN AND SKINNER CREEKS (SP02)

The Jordan and Skinner Creeks watershed, located in southwest Green County, is depicted on the map accompanying the Honey and Richland Creeks watershed. Agriculture is the dominant land use in the Jordan and Skinner Creeks watershed. The only surface water permitted point source discharger is the community of Browntown. We know little about water quality or in-stream habitat in the watershed, though we assume polluted runoff affects water quality and in-stream habitat. The major site of publicly owned land in the watershed is the Browntown-Cadiz Springs State Recreation Area. We did not recommend monitoring in the last Sugar-Pecatonica River basin plan because the potential use of the streams was thought to be less than other watersheds in the basin (Eagan, 1988).

RECOMMENDATIONS

Management

1. The Bureau of Parks and Recreation, with the assistance of Water Resources Management, should undertake expanded self-help monitoring on Zanders Lake and Beckmans Lake at Browntown-Cadiz Springs State Recreation area to begin to address water quality problems of the lake (Type B).

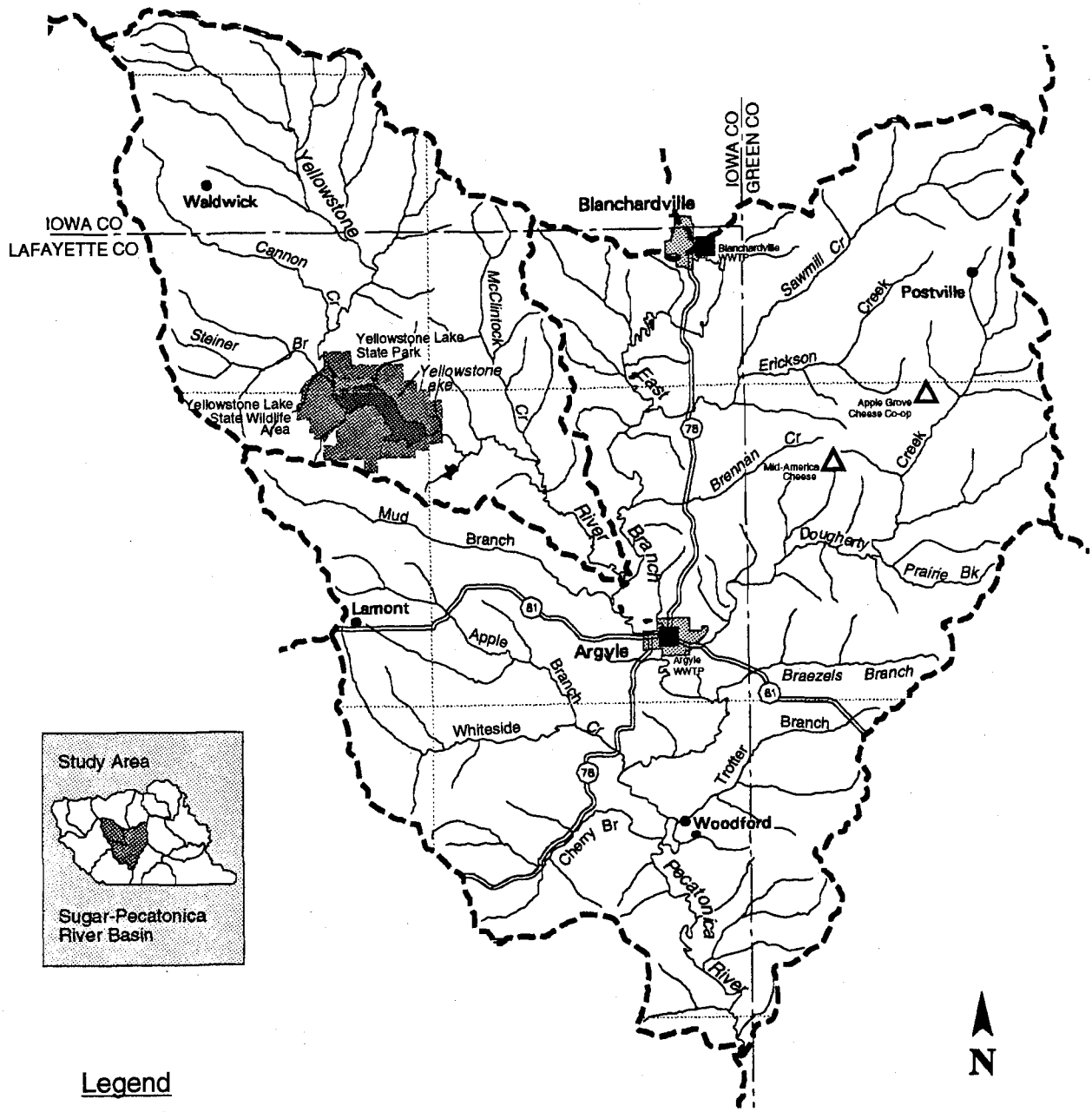
Table 5. Jordan and Skinner Creeks Watershed (SP02) COUNTIES: Green and Lafayette SQUARE MILES: 93

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Argus School Branch	2	WWFF/2[e]	COLD/1	full-1,not-1	E	DEF	NPS/HAB,SED,TEMP	R	NR	28
Buckskin School Creek	6	WWFF/6[e]	COLD/2	full-4,not-2	E	DEF	NPS/HAB,SED	R	NR	28
Bushnell Creek	0-1.2	WWSF/1.2[e]				DEF		R	NR	3,28
	1.2-3.7	COLD/2.5[b] Class II	same	part-2.5	E	COLD	NPS/HAB,SED			
	3.7-6.2	COLD/2.5	same	part-2.5	E	COLD	"			
	6.2-7					DEF				
Jordan Creek	0-10	WWSF/10[e]	same	part-10	E	DEF	NPS/HAB,SED		NR	28
	10-13					DEF				
Pecatonica River	12	WWSF/12[e]	same	part-12		DEF	NPS/HAB,SED		NR	
Skinner Creek	14	WWSF/14[e]	same	part-14	E	DEF	NPS/HAB,SED		NR	28
Smock Creek	6	WWSF/6[e]	COLD(?)	not-6	E	DEF	NPS,HM/HAB,SED,TEMP		NR	28
Winn Creek	2	WWFF/2[e]	same	full-2	E	DEF			NR	28
Zanders Creek	2	WWFF/2[e]	same	full-2	E	DEF		R	NR	28
Unnamed streams (25)	37				DEF					
SUBTOTALS		COLD/5 WWSF/43.2 WWFF/12 LFF/0 LAL/0 UNK/40.8	COLD/14 WWSF/37.2 WWFF/9 LFF/0 LAL/0 UNK/40.8							

TOTAL STREAM MILES: 101

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Lower East Branch Pecatonica River (SP03) and Yellowstone River (SP04) Watersheds



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:

- Surface Water
- Groundwater
- Both

Industrial Discharge to:

- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:200,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

LOWER EAST BRANCH PECATONICA RIVER (SP03)

The Lower East Branch Pecatonica River watershed, in the western part of Green County and northeastern Lafayette County, is a priority watershed proje· t under the Wisconsin Nonpoint Source Water Pollution Abatement Program. A number of smaller trout streams in the watershed (WDNR, 1980) are affected by polluted runoff. A detailed description of water quality conditions in the watershed prior to the beginning of the priority watershed project can be found in *Lower East Branch Pecatonica Priority Watershed Project: Water Resources Appraisal Report* (Marshall, 1991). A detailed description of the watershed project goals and objectives can be found in *Nonpoint Source Control Plan for the Lower East Branch Pecatonica River Priority Watershed Project* (Haynes, 1992).

Two permitted facilities discharge to surface water in the watershed, the villages of Argyle and Blanchardville. Information on these municipal point source dischargers can be found in the point source section of this document.

Table 6. Lower East Branch Pecatonica River Watershed (SP03) COUNTIES: Green and Lafayette SQUARE MILES: 145

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Apple Branch	0-2	COLD/2[b] Class III	COLD,II	n-2	M	COLD	NPS,SB/TURB,TEMP,HAB		NA	3,17,18,28
	2-4	COLD/2[b] Class II	same	p-2	E	COLD	"			
	4-6.8	WWFF/2.8[e]	COLD	not-2.8	M	DEF	"			
Braezels Branch	0-4	WWFF/4[e]	COLD	not-4	M	DEF	NPS,SB/HAB,SED		NA	3,17,18
	4-7					DEF				
Brennan Creek	0-2.3	COLD/2.3[b,e] Class III	COLD[b] Class II	not-2.3	M	COLD	NPS,SB/SED,HAB		NA	3,17,18,28
	2.3-3.8	COLD/1.5[e] Class II	same	full-1.5	E	DEF				
Cherry Branch	0-5.8	WWFF/5.8[e]	COLD	not-5.8	M	DEF	NPS/HAB,SED,TURB		NA	17,18
	5.8-7					DEF				
Dougherty Creek	0-4.5	WWSF/4.5[e]	same	part-4.5	E	DEF	NPS/HAB,SED		NA	1,3,17,18,28
	4.5-5.6	COLD/1.1[b] Class III	COLD, II	not-1.1	M	COLD	NPS,SB/HAB,SED,TURB,DO			
	5.6-14.6	COLD/9[b] Class II	same	part-9	M	COLD	"			
	14.6-16.6	LFF/2[e]	WWFF	not-2	M	DEF				
E. Br. Pecatonica River	0-33.5	WWSF/33.5[e]	same	part-33.5	E	DEF	NPS/HAB,SED,TURB		NA	1,28,29
Erickson Creek	0-2.6	COLD/2.6[b] Class III	COLD,II	not-2.6	M	COLD	NPS,SB/HAB,SED,TURB		NA	3,17,18,28
	2.6-6	COLD/3.4[b] Class II	same	part-3.4	M	COLD	"			
	6-8					DEF				
(Jockey Hollow Creek)	2.4	LFF/2.4[e]	WWFF	not-2.4	M	DEF	NPS,HM/HAB		NA	17,18
Mud Branch	0-3.7	COLD/3.7[b] Class II	same	part-3.7	E	COLD	NPS,HM,SB/HAB,SED,TURB		NA	3,17,18,28
	3.7-5.2	COLD/1.5[b] Class III	COLD,II	not-1.5	M	COLD	"			
	5.2-6.5	COLD/1.3[b]	same	part-1.3	M	COLD	"			
	6.5-10					DEF				
Prairie Brook	2	COLD/2[b] Class II	COLD,II	not-2	M	COLD	NPS/SED,HAB		NA	3,17,18,28
Sawmill Creek	0-4.4	COLD/4.4[b,e] Class III	COLD,II[b,e]	not-4.4	M	COLD	NPS,SB/HAB,SED,TURB		NA	3,17,18,28
	4.4-8.7	COLD/4.3[b] Class II	same	part-4.3	M	COLD	"			
	8.7-12					DEF				
Trotter Branch	3.8	WWFF/3.8[e]	same	p-3.8	M	DEF	NPS,SB/HAB,SED		NA	17,18

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Whiteside Creek	0-1.6	WWFF/1.6[e]	same	full-1.6	E	DEF			NA	3,17,18,28
	1.6-7.6	COLD/6[b] Class II	same	part-6	M	COLD	NPS,SB/HAB,SED		NA	
	7.6-9					DEF				
Unnamed trib to Dougherty Creek (T3NT6E,S16)	4.1	WWFF/4.1[e]	same	part-4.1	M	DEF	NPS,SB/HAB,SED		NA	17
Unnamed streams (34)	55.9					DEF				
SUBTOTALS		COLD/47.1 WWSF/38 WWFF/22.1 LFF/4.4 LAL/0 UNK/64.9	COLD/59.7 WWSF/38 WWFF/13.9 LFF/0 LAL/0 UNK/64.9							

TOTAL STREAM MILES: 176.5

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update .
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

YELLOWSTONE RIVER (SP04)

The Yellowstone River watershed, depicted on the map accompanying the Lower East Branch Pecatonica River (above) is in northeastern Lafayette County and western Green County. The watershed's land use is dominated by agricultural. A significant portion of publicly owned land exists in the watershed: about 800 acres in Yellowstone Lake State Park, and 4,000 acres in the Yellowstone Wildlife Area (Howard, 1994). The addition of 2,200 acres to the wildlife area and, its management for wildlife, have probably reduced the impacts of polluted runoff on Steiner Branch, Yellowstone River and Yellowstone Lake. This watershed was ranked high under the old nonpoint source priority watershed project selection pool (Eagan, 1988). Field work conducted by Southern District staff in the fall of 1994 noted sedimentation in the streams tributary to Yellowstone Creek (WDNR, 1994). Potential sources of the sedimentation were also noted. This, coupled with the water quality problems noted in Yellowstone Lake, make this watershed a candidate for possible selection as a nonpoint source priority watershed project.

RECOMMENDATIONS

Monitoring

1. Water Resources Management should conduct condition monitoring in the Yellowstone River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

2. Parks and Recreation, with the assistance of Water Resources Management, should undertake monitoring on Yellowstone Lake, using the lakes ambient monitoring protocol, to address water quality problems caused by polluted runoff (Type B).

Nonpoint Source

3. The nonpoint source priority watershed selection committee should consider the Yellowstone River Watershed a high priority candidate for a priority watershed project under the state's nonpoint source water pollution abatement program (Type B).

Steiner Branch

Steiner Branch is a Class II and Class III trout stream (WDNR, 1980) tributary to the Yellowstone River at Lake Yellowstone. It had suffered from extreme sedimentation due to agricultural land use practices in the early 1980s (WDNR, 1993[1]). These practices have been altered or eliminated, primarily because of land acquisition for the Yellowstone Wildlife Area. A dam on the headwaters of the creek affects water quality and is probably preventing the creek from meeting its full cold water fishery potential (Van Dyck, 1994).

Yellowstone Lake

Yellowstone Lake is a 455-acre impoundment on the Yellowstone River. The lake has a

good warm water fishery and experiences a high level of public use because it is within a state park. Water quality has been a problem. Excessive sedimentation and nutrient loading resulted in algae blooms and excessive aquatic plant growth in the past (Eagan, 1988). Lack of adequate aquatic plant growth due to sedimentation has been a more recent problem. Heavy motor boat use and high winds cause excessive wave action resuspending sediment and nutrients and keeping the lake turbid. Carp and bullhead populations in the lake have expanded rapidly (Van Dyck, 1994). Yellowstone Lake is one of the biggest lakes in the driftless region of Wisconsin and has a relatively small watershed-to-lake surface area ratio for impoundments in this region. Thus, the lake may have a better chance of responding to improved land use management than other impoundments in the region.

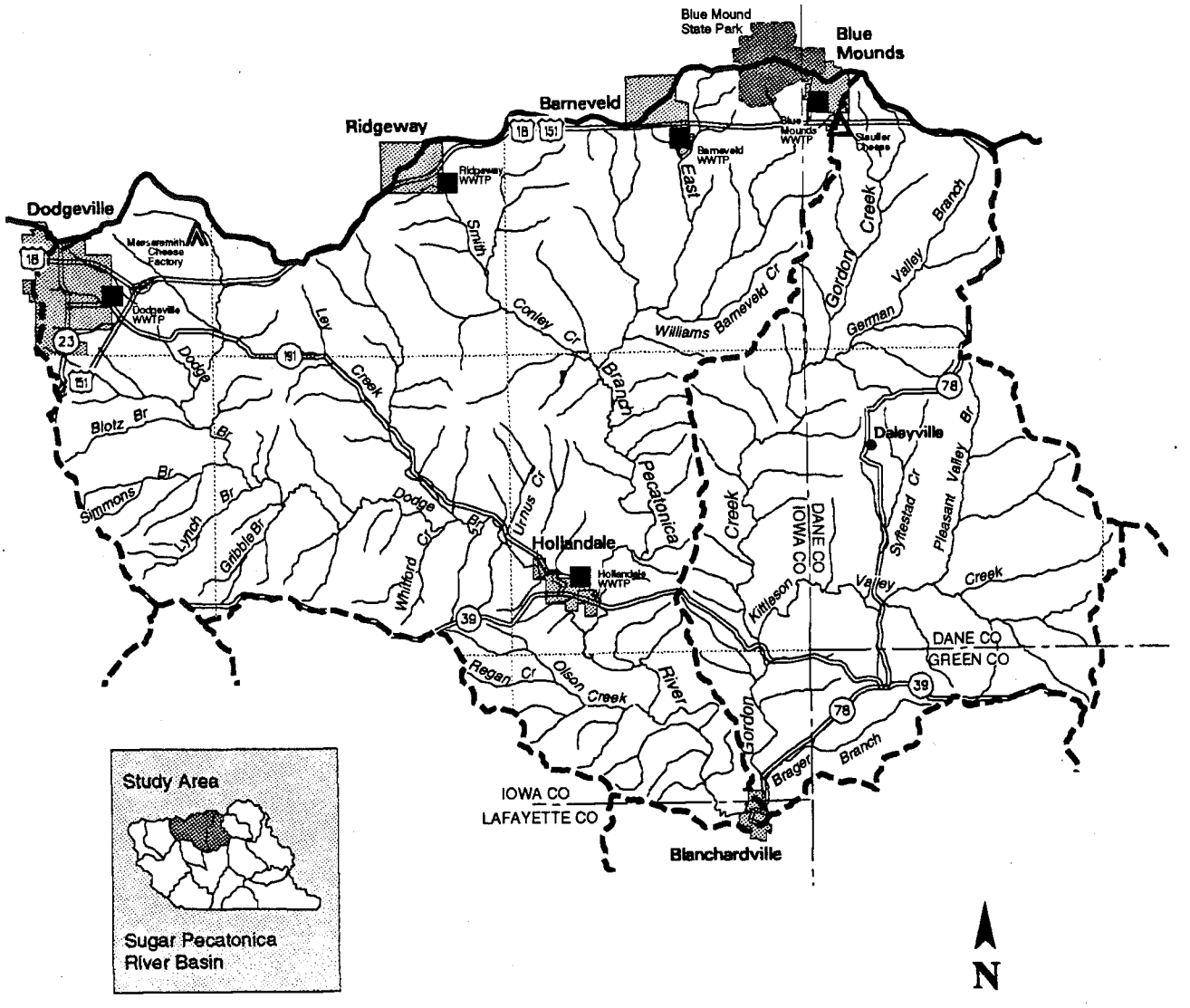
Table 7. Yellowstone River Watershed (SP04) COUNTIES:Iowa, Lafayette, and Green SQUARE MILES: 57

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Cannon Creek	0-1.3	COLD/1.3[b] Class II	same	part-1.3		COLD	NPS/HAB,SED		H	3,28
	1.3-4.3	COLD/3[b] Class III	same	part-3		COLD	NPS/HAB,SED			
	4.3-7									
McClintock Creek	7					DEF			NR	
Steiner Branch	0-1.8	COLD/1.8[b] Class III	same	part-1.8		COLD	NPS/SED,HAB	N	H	1,3,28
	1.8-2.3	COLD/0.5[b] Class II	same	part-0.5		COLD	NPS/SED,HAB			
	2.3-4					DEF				
Yellowstone River	0-13.5	WWSF/13.5[e]	same	full-11.1,part-2.4		DEF	NPS/SED,DO		M	28
	13.5-17.5	COLD/4	same	part		COLD	"		H	
	17.5-25					DEF				
Unnamed streams (24)	32				DEF					
SUBTOTALS		COLD/10.6 WWSF/13.5 WWFF/0 LFF/0 LAL/0 UNK/50.9	COLD/10.6 WWSF/13.5 WWFF/0 LFF/0 LAL/0 UNK/50.9							

TOTAL STREAM MILES: 74

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Gordon Creek (SP05) and Upper East Branch Pecatonica River (SP06) Watersheds



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:

- Surface Water
- Groundwater
- Both

Industrial Discharge to:

- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:220,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

GORDON CREEK WATERSHED (SP05)

The Gordon Creek Watershed, in southwestern Dane, northwestern Green, and southeastern Iowa counties, is an agricultural watershed in the driftless part of the state, with no incorporated areas in it. Polluted runoff problems exist in the watershed, but the extent of the problem has not been fully evaluated. The Dane County Regional Planning Commission has recommended that this watershed be considered a high priority watershed for possible selection as a nonpoint source priority watershed project (DCRPC, 1991).

RECOMMENDATIONS

Monitoring

1. Water Resources Management should conduct condition monitoring on principal streams in the Gordon Creek Watershed as part of the basin assessment monitoring effort (Type B).

Nonpoint Source

2. The nonpoint source priority watershed project selection committee should consider the Gordon Creek Watershed a high priority candidate for selection as a priority watershed project under the nonpoint source pollution abatement program (Type B).

German Valley Branch

German Valley Branch is a tributary to Gordon Creek in southwestern Dane County. The stream is a forage fishery stream (WDNR, 1992-93[1]) and assumed to generally have good water quality. Polluted runoff is the major water quality and habitat problem. Some ditching has occurred; pools, particularly in the lower half, have been degraded by sedimentation. The stream might be able to support trout (Marshall, 1988) if intensive habitat and watershed management are implemented (DCRPC, 1992). Intensive agricultural uses along the stream, cultivation and grazing, appear to be declining in the upper reaches of the stream (WDNR,1992-93[1]). This trend may be due to increased "hobby farming" and rural home development.

Gordon Creek

Also known as Blue Mounds Branch and Big Spring Creek, this stream rises near the village of Blue Mounds and flows south to the East Branch Pecatonica River near Blanchardville. It is a Class II trout stream for 11 miles of its length (WDNR, 1980). Sources of polluted runoff are the primary water quality and habitat problems for Gordon Creek, including intense grazing, exposed and eroding banks, and runoff from cultivated fields and barnyards (WDNR,1992-93[1]). The reach of Gordon Creek in Dane County is considered as Exceptional Resource Water (ERW) under the state antidegradation rules (NR 102 and NR 207).

Kittleson Valley Creek

Kittleson Valley is a tributary to Gordon Creek in southeast Iowa County. Seven miles are considered Class II trout waters while an additional two miles are Class III (DNR, 1980). Recreational use of this stream is impaired due to polluted runoff. Heavy sedimentation in the stream bottom (WDNR, 1992-93[1]), is probably due to bank erosion and runoff from farm fields.

Pleasant Valley Creek

This is a tributary to Kittleson Valley Creek in southwest Dane County. It is considered a warm water forage fishery stream, but does have the potential for trout (Marshall, 1988). Water quality and in-stream habitat are thought to be good (WDNR,1992-93[1]). Grazing along the stream appears to be the primary water quality and habitat problem.

Syftestad Creek

Syftestad Creek is a tributary to Kittleson Valley Creek. It is a warm water forage fishery stream that may have trout potential (Day, 1985). Excess sedimentation has resulted in degraded habitat (DCRPC, 1992[6]). Other problems resulting from polluted runoff are also may also exist. Redside dace, a fish on the state's threatened and endangered species list, has been found here.

Table 8. Gordon Creek Watershed (SP05) COUNTIES: Iowa,Dane, Lafayette SQUARE MILES: 77

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING POTENTIAL USE/MILES	BIOLOGICAL USE EXISTING POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Brager Creek	4					DEF		R	NR	
German Valley Branch	7	WWFF/7[e]	COLD/	not-7	M	DEF	NPS,SB,HM/HAB,SED	N/R	H	1,4,16,28
Gordon Creek	0-4	WWSF/4[e]	same	part-4	E	DEF	NPS/HAB,SED	N/R	H	1,2,3,16,28
(Big Spring Cr.)	4-15	COLD/11[b] Class II	same	part-11	E	COLD/7,ERW/4	NPS/HAB,SED	N/R		
or (Blue Mounds Br.)	15-16.2									
(Jeglum Valley Creek)	1.5	COLD/1.5[e] Class III	same	part-1.5	E	DEF	NPS/HAB,SED	R	NR	3,28
Kittleson Valley Creek	0-2	WWSF/1[e]	same		E	DEF	NPS/HAB,SED	N/R	H	1,3,28
	2-4	COLD/2[b] Class III	same	part-2	E	COLD	"			
	4-7	COLD/5[b] Class II	same	part-5	E	COLD	"			
	7-9					DEF				
(Lee Creek)	0-2	COLD/2[b] Class II	same	part-2	E	COLD	NPS/HAB	R	H	3,16,28
(York Valley Creek)	2-3					DEF				
(McPeace Valley Creek)	1	WWFF/1[e]	same	full-1	E	DEF		R	L	28
Pleasant Valley Branch	5	WWFF/5[e]	COLD	not-5	M	DEF	NPS/HAB	N/R	H	1,4,16,28
Syftestad Creek	5	WWFF/5[e]	COLD	not-5	M	DEF	NPS/HAB,SED	N/R	H	1,4,16,28
Unnamed streams (12)	22.3					DEF				
SUBTOTALS		COLD/20.5 WWSF/5 WWFF/18 LFF/0 LAL/0 UNK/30.5	COLD/36.5 WWSF/5 WWFF/1 LFF/0 LAL/0 UNK/							

TOTAL STREAM MILES: 74

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

UPPER EAST BRANCH PECATONICA RIVER (SP06)

The Upper East Branch Pecatonica River watershed, depicted on the map with the Gordon Creek Watershed (above) lies in eastern Iowa County and a very small portion of western Dane County. The dominant land use is agricultural. Five municipal wastewater permittees discharge to surface water in the watershed: Barneveld, Dodgeville, Blue Mounds, Ridgeway and Hollandale. The 1988 Sugar-Pecatonica basin plan noted that 14 of 16 streams in the watershed had excess sedimentation and habitat degradation due to polluted runoff. There is, however, little monitoring data to assess the extent and severity of the problem.

Wetlands along streams in this watershed should be protected because there are fewer acres of wetlands in this region. Public acquisition of higher quality wetlands and strict enforcement of shoreland-wetland zoning ordinances might held protect these areas.

RECOMMENDATIONS

Management

1. County zoning offices should vigorously enforce shoreland-wetland zoning ordinances in the Upper East Branch Pecatonica River Watershed (Type C).

Monitoring

2. Water Resources Management should conduct condition monitoring in Upper East Branch Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

Dodge Branch

Dodge Branch is a tributary to the East Branch Pecatonica River. Although a Class II trout stream for 10 miles of its length (WDNR, 1980), it is not being actively managed for trout due to poor survival rate (Schlesser, 1988[34]). The upper two miles of the stream are classified as limited forage fishery waters. Dodgeville discharges its treated wastewater effluent in the headwaters reach of the stream. Urban runoff has also caused water quality and quantity problems in the headwaters reach (Van Dyck, 1994). Water quality is assumed to be generally good. Sedimentation is a problem with exposed and eroding banks and some intense grazing of banks in some spots (WDNR, 1992-93[1]). The slender madtom, an endangered species, has been found in this stream and wetland areas along this stream include one high quality southern sedge meadow complex.

East Branch Pecatonica River

The headwaters of the East Branch are in this watershed. The river above the Barneveld wastewater treatment plant outfall is classified as Class II trout waters (WDNR, 1980). The stream at the discharge site has been described as having good habitat with deep pools and long riffles with some sedimentation. The site was also reported to have good water quality (Schlesser, 1988[29]). We know little about water quality below the Barneveld outfall. Sedimentation is a problem at some spots in the stream and there

are exposed eroding banks and cattle grazing on the banks at some locations (WDNR, 1992-93[1]).

Ley Creek

Approximately three miles of Ley Creek are classified as Class II trout stream (WDNR, 1980), but we know nothing about the stream's water quality. We suspect the reconstruction of State Trunk Highway 191 may have resulted in significant amounts of sediment reaching the stream.

Smith Conley Creek

Smith Conley is a Class II trout stream for all but the upper most reach, which is limited forage fishery. We assume the water quality to be good, but sediment carried in runoff may degrading the stream (WDNR, 1992-93[1]). The Ridgeway wastewater treatment plant discharges its treated wastewater effluent to the headwaters reach of the creek (Schlesser, 1988[35]).

Whitford Creek

Whitford Creek is a Class II trout tributary to Dodge Branch. Flow and sedimentation may be water quality problems in the lower end of the stream (WDNR, 1992-93[1]). There is a nice, though small, wetlands complex adjacent to part of the stream.

Williams Barneveld Creek

This small spring fed tributary to the East Branch Pecatonica River is a Class II trout stream (WDNR, 1980). We assume water quality is good, but sediment is a problem in the stream. Cattle grazing occurs on the streambanks in some locations (WDNR, 1992[1]).

Table 9. upper East Branch Pecatonica River Watershed (SP06) COUNTIES: Iowa SQUARE MILES: 134

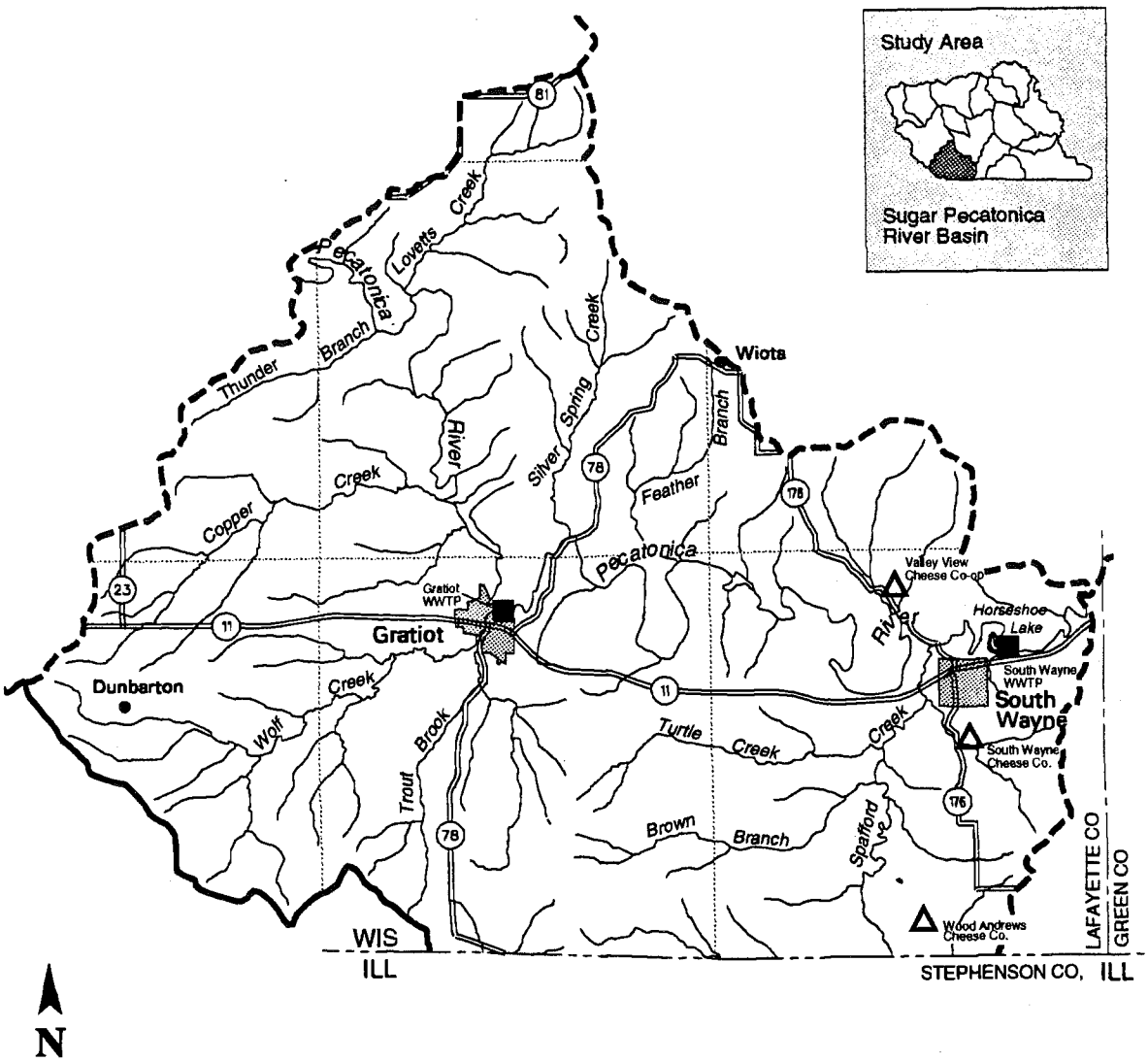
NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Blotz Branch	3					DEF		R	NR	
(Conley-Lewis Creek)	0-3	WWSF/3[a]	same	part-3	E	DEF	NPS/HAB,SED	R	NR	3,28
	3-6	COLD/3[b] Class II	same	part-3	E	COLD	NPS/HAB,SED			
	6-9					DEF				
Dodge Branch	0-9.7	WWSF/9.7[a]	same	not-9.7	E	WWSF	NPS/SED,HAB,FLO	N/R	NR	1,3,28,34
	9.7-16.9	COLD/7.2[b] Class II	same	not-7.2	E	COLD	NPS/SED,HAB,FLO			
	16.9-21.3	WWSF/4.4[a]	same	not-4.4	E	WWSF	NPS/SED,HAB,FLO			
	21.3-22	LFF/0.7[c]	same	part-0.7		LFF	PSM/			
E.Br. Pecatonica R.	33.5-55.6	WWSF/22.1[a]	same		E	WWSF	NPS/HAB,SED	N/R	NR	1,3,29
	55.6-59.6	COLD/4[b] ClassII	same	part-4	E	COLD	NPS/HAB,SED			
	59.6-66	Unk/6.4				DEF				
Gribble Branch	3	COLD/3[b] Class II	same	part-3	E	COLD	NPS/HAB,SED	R	NR	3,28
Hutchinson Creek	1	COLD/1[b] Class II	same		E	COLD	NPS/HAB,SED	R	NR	3,28
(Ley Creek)	0-2.9	COLD/2.9[b] Class II	same	part-2.9	E	COLD	NPS/HAB,SED	N/R	NR	1,3,28
	2.9-4					DEF				
(Long Valley Creek)	2					DEF		R	NR	
Lynch Branch	2.6	COLD/2.6[b] Class II	same	part-2.6	E	COLD	NPS/HAB,SED	R	NR	3,28
Olson Creek	0-4	COLD/4[b] Class II	same	part-4	E	COLD	NPS/HAB,SED	R	NR	3,28
	4-5					DEF				
Regan Creek	0-1.5	COLD/1.5[b] Class II	same	part-1.5	E	COLD	NPS/HAB,SED	R	NR	3,28
	1.5-2					DEF				
(Schmidt Creek)	1.3	COLD/1.3[b] Class II	same			COLD	NPS/HAB,SED	R	NR	3,28
	1.3-2					DEF				
Simmons Branch	3					DEF		R	NR	
Smith-Conley Creek	0-7	COLD/7[b] Class II	same	part-7	E	COLD	NPS/HAB,SED	N/R	NR	1,3,35
	7-8	LFF/1[c]	same	full-1	E	LFF				
Urnus Creek	2					DEF		R	NR	

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Whitford Creek	0-2	COLD/2[b] Class II	same	part-3	E	COLD	NPS/HAB,SED	N/R	NR	1,3,28
	2-3					DEF				
Williams-Barneveld Cr.	0-4.9	COLD/4.9[b] Class II	same	part-4.9	E	COLD	NPS/HAB,SED	N/R	NR	1,3
	4.9-7					DEF				
Trib. to East Branch (Barneveld)	0-0.7	LAL/0.7[c]	same			LAL		R	NR	29
Unnamed streams (39)	49					DEF		R		
SUBTOTALS		COLD/44.4 WWSF/39.2 WWFF/0 LFF/1.7 LAL/0.7 UNK/74.8	COLD/44.4 WWSF/39.2 WWFF/0 LFF/1.7 LAL/0.7 UNK/74.8							

TOTAL STREAM MILES: 160.8

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Lower Pecatonica River Watershed (SP07)



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:
- Surface Water
- Groundwater
- Both

Industrial Discharge to:
- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:180,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

LOWER PECATONICA RIVER (SP07)

The Lower Pecatonica River watershed is in southeastern Lafayette County. It is an agricultural watershed. As with many other watersheds in the basin, the DNR lacks water quality data about its streams. Some high quality wetlands exist along the Pecatonica River, including oxbow lake, shallow water marsh, lowland forest, and southern sedge meadow wetland complexes. Wetlands along streams in this watershed should be protected because there are few acres of wetlands in this region. Public acquisition of the higher quality wetlands complexes should be considered.

RECOMMENDATIONS

Management

1. County zoning offices should vigorously enforce shoreland-wetland zoning ordinances (Type C).

Monitoring

2. Water Resources Management should conduct condition monitoring in Lower Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

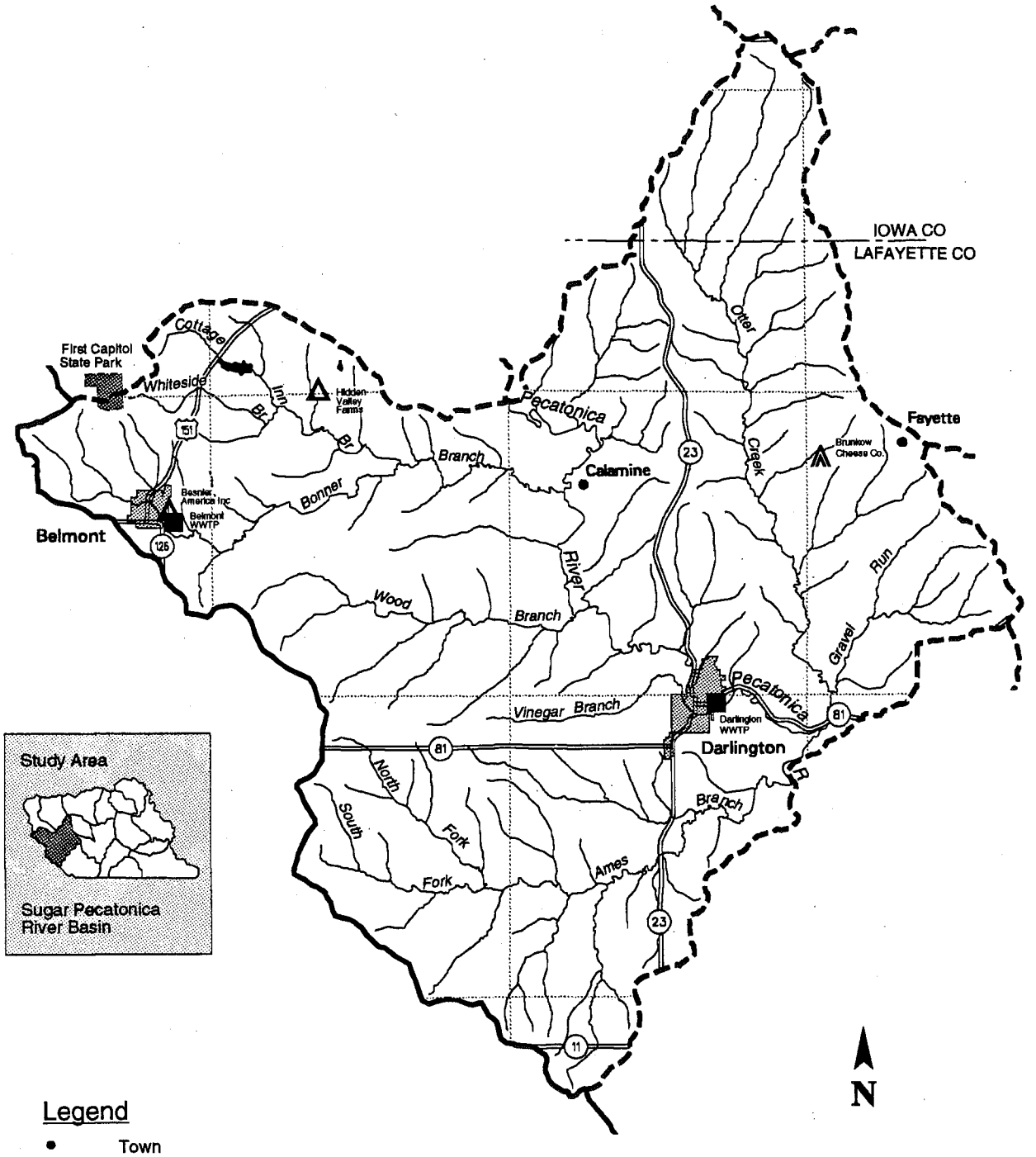
Table 10. Lower Pecatonica River (SP07) COUNTIES: Lafayette SQUARE MILES: 95

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING POTENTIAL USE/MILES	USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Brown Branch	0-2.5	COLD/2.5[b] Class II	same	part-2.5	E	COLD	NPS/SED	R	NR	3,28
	2.5-4.3	COLD/1.8[b] Class III	same	part-1.8	E	COLD	"			
	4.3-6					DEF				
Copper Creek	0-1.8	COLD/1.8[b] Class III	COLD,II	not-1.8	E	COLD	NPS/SED	R	NR	3,28
	1.8-3.8	COLD/2[b] Class II	same	part-2	E	COLD	"			
	3.8-5.6	COLD/1.8[b] Class III	COLD,II	not-1.8	E	COLD	"			
	5.6-7					DEF				
Feather Branch	5					DEF		R	NR	
Lovetts Creek	0-4.3	COLD/4.3[b] Class II	same	part-4.3	E	COLD	NPS/HAB,SED	R	NR	3,28
	4.3-6					DEF				
Pecatonica River	23.5	WWSF/23.5[a]	same	part-23.5	E	WWSF	NPS/SED,DO,PST	R	NR	28
Silver Spring Creek	5	WWFF/5[e]	COLD,II	not-5	E	DEF	NPS/SED	R	NR	28
Spafford Creek	9	WWSF/9[e]	same	part-9	E	DEF	NPS/SED	R	NR	28
Thunder Branch	3					DEF		R	NR	
Trout Brook (Slawther Creek)	0-2.3	COLD/2.3[b] Class III	COLD,II	not-2.3	E	COLD	NPS/SED	R	NR	3,28
	2.3-4.6	COLD/2.3[b] Class II	same	part-2.3	E	COLD	"			
	4.6-6					DEF				
Turtle Creek	6					DEF		R	NR	
Wolf Creek	0-1	WWSF/1[a]	same	full-1	E	WWSF	NPS/SED,DO,PST	R	NR	3,28
	1-5.5					DEF				
	5.5-7	COLD/1.5[b] Class II	same	part-1.5	E	COLD				
	7-10					DEF				
Unnamed streams (43)	59									
SUBTOTALS		COLD/20.3 WWSF/33.5 WWFF/5 LFF/0 LAL/0 UNK/86.7	COLD/25.3 WWSF/33.5 WWFF/0 LFF/0 LAL/0 UNK/86.7							

TOTAL STREAM MILES: 145.5

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Middle Pecatonica River (SP08)



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:
- Surface Water
- Groundwater
- Both

Industrial Discharge to:
- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:200,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

MIDDLE PECATONICA RIVER (SP08)

The Middle Pecatonica River watershed in central Lafayette County is dominated by agricultural land uses. Two municipal permittees discharge to surface water in the watershed: Belmont and Darlington. We know little about water quality or in-stream habitat of streams in this watershed. The slender madtom, an endangered fish species in Wisconsin, has been found in four streams in the watershed: Bonner Branch, Cottage Inn Branch, Otter Branch, and Wood Branch (Fago, 1982).

RECOMMENDATIONS

Monitoring

1. Water Resources Management should conduct condition monitoring in Middle Pecatonica River watershed as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

Table 11. Middle Pecatonica River Watershed (SP08) COUNTIES: Iowa and Lafayette SQUARE MILES: 186

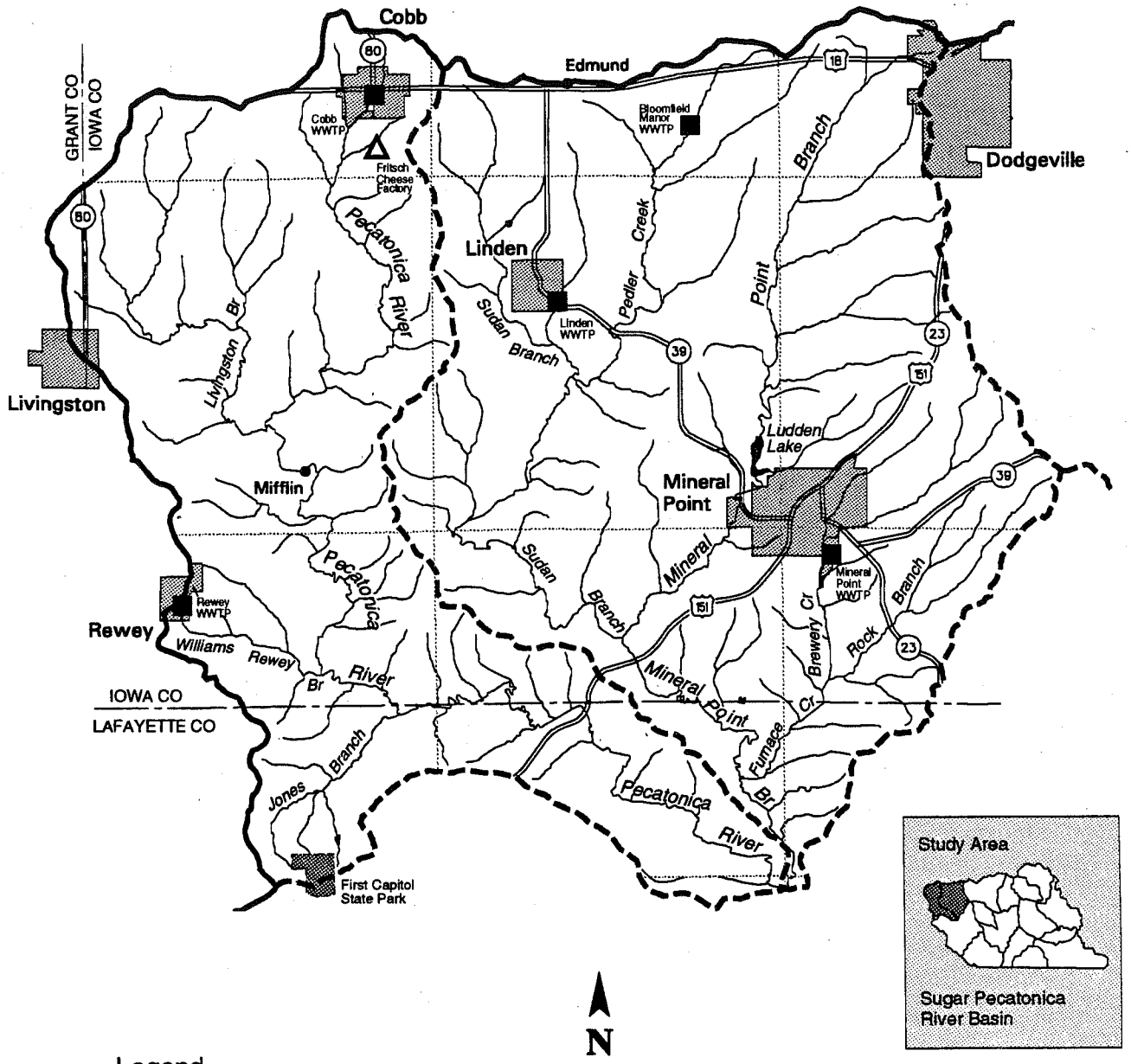
NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Ames Branch	11	WWSF/11[a]	same	not-11	E	DEF	NPS/HAB,SED,DO,PST	R	NR	28
Bonner Branch	17	WWSF/17[a]	same	not-17	E	WWSF	NPS/HAB,SED,DO,PST	R	NR	15,28
Cottage Inn Branch	7	WWSF/7[a]	same	not-7	E	DEF	NPS/HAB,SED,DO,PST	R	NR	15,28
(Gravel Run Creek)	0-2	COLD/2[b] Class III	same	part-2		COLD	NPS/HAB,SED,DO,PST	R	NR	3,28
	2-3	COLD/1[b] Class II	same	part-1		COLD	"			
	3-6					DEF				
N. Fork Ames Br.	5	WWFF/5[a]						R	NR	
Otter Creek	19	WWSF/19[a]	same	not-19		DEF	NPS/HAB,SED,DO,PST	R	NR	15,28
Pecatonica River	19.7	WWSF/19.7[a]	same	part-19.7	E	WWSF	NPS/HAB,SED	R	NR	28
S. Fork Ames Branch	4					DEF		R	NR	
Vinegar Branch	5					DEF		R	NR	
Whiteside Branch	2					DEF		R	NR	
Wood Branch	8	WWSF/8[a]	same	not-8		DEF	NPS/HAB,SED,DO,PST	R	NR	15,28
Unnamed trib to Ames Br. (T2NR3E,S20)	6					DEF		R	NR	
Unnamed Trib to Ames Br. (T2NR3E,S15)	5					DEF		R	NR	
Unnamed trib to Otter Cr. (T3NR3E,S24)	5					DEF		R	NR	
Unnamed trib to Pecatonica River (T3NR3E,S05)	5					DEF		R	NR	
Unnamed streams (52)	69				DEF					
SUBTOTALS		COLD/3 WWSF/81.7 WWFF/5 LFF/0 LAL/0 UNK/104	COLD/3 WWSF/81.7 WWFF/0 LFF/0 LAL/0 UNK/109							

TOTAL STREAM MILES:193.7

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this

time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Mineral Point Branch (SP09) and Upper West Branch Pecatonica River (SP10) Watersheds



N

Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:
- Surface Water
- Groundwater
- Both

Industrial Discharge to:
- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:180,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

MINERAL POINT AND SUDAN BRANCHES (SP09)

The Mineral Point and Sudan Branches watershed in southwest Iowa County and a very small part of northwest Lafayette County is dominated by agricultural land uses. Mineral Point, Linden and Bloomfield Manor discharges to surface water in the watershed. Historically, mining was a major industry in the Mineral Point area. Mine waste piles, called roaster piles, remaining from the lead, zinc, and copper mining have degraded water quality.

RECOMMENDATIONS

Monitoring

1. Water Resources Monitoring should conduct remedial action monitoring of Brewery Creek and Furnace Branch as part of basin assessment monitoring effort in the Sugar-Pecatonica rivers basin (Type B).

2. Water Resources Management should conduct condition monitoring on Sudan, Mineral Point and Rock branches, and Pedler Creek as part of the Sugar-Pecatonica basin assessment monitoring effort (Type B).

Brewery Creek

Brewery Creek rises near Mineral Point and flows south to the junction with Rock Branch, where it becomes Furnace Creek. Runoff from roaster piles has severely degraded water quality and in-stream habitat, demonstrated by the limited aquatic life biological use classification of the stream (Schlesser, 1988). A 1990 report documented low fish populations and poor fish diversity in the reach below the roaster pile (Schlesser, 1990). Additional monitoring in the summer of 1992 confirmed this (Marshall, 1992-93). An Environmental Repair Fund (ERF) project to consolidate and cap the roaster piles began in early 1992, and was completed in the fall of 1993, with the purpose of improving water quality and in-stream habitat. A portion of the highly degraded streambed near the consolidated roaster pile was filled, with a new stream channel dug and the stream diverted to it. Brook trout were planted in the new stream channel in the fall of 1993. Wetlands immediately adjacent the consolidated roaster pile have also been degraded by runoff from the pile. We expect that water quality and in-stream habitat will improve significantly once the ERF project is completed, perhaps allowing the stream to be reclassified as at least supporting forage fishery. Southern District Water Resources Management staff monitored the stream in 1994 to assess conditions, including surface water quality, in-stream habitat, fisheries, stream bottom sediment and wetlands to determine success of the ERF project.

In the spring of 1994, brook trout were still present in Brewery Creek, along with a variety of forage fish. Water quality chemistry parameters had improved although the levels for zinc are still considered high. Levels of heavy metals in stream sediment vary. Ins-tream habitat is poor in some reaches.

Southern District staff will continue to monitor the creek in 1995. A formal stream classification for Brewery Creek will be done once the stream has stabilized.

Furnace Branch

Furnace Branch is formed by the confluence of Brewery Creek and Rock Branch. Water quality and in-stream habitat are also degraded by the runoff from the roaster piles at Mineral Point (Schlesser, 1990). Polluted runoff from stream bank grazing may also affect water quality and in-stream habitat, although presently masked by the pollution from the roaster piles. While the stream has not been formally classified, we assume its present biological use to be limited aquatic life. It has the potential to support a warm water forage fishery, and possibly even a trout stream if conditions improve (Schlesser, 1990).

Mineral Point Branch

Mineral Point Branch rises near Dodgeville and flows south to the Pecatonica River. It partially supports a warm water sport fishery, with a portion managed for smallmouth bass. This fishery may be degraded by polluted runoff. A 1990 smallmouth bass survey indicates that the bass fishery in the stream may be affected by whatever factors are causing the decline of the smallmouth bass fishery in southwestern Wisconsin (WDNR, 1992-93[1]). A dam across the stream forms Ludden Lake. We have no information about the effects of that dam on the fishery or water quality below the dam. Two fish species on the state's threatened and endangered species list have been found in this stream, the slender madtom and the Ozark minnow (Fago, 1982).

Pedler Branch

Pedler Branch is a tributary to Sudan Branch in Iowa County. Polluted runoff from barnyards and streambank grazing have degraded in-stream habitat and water (Schlesser, 1993). One permitted facility discharges to the stream. The facility had some problems, but these have been corrected. Recent monitoring resulted in a stream classification change, upgrading the limited forage fishery reach to warm water forage fishery. This represents an improvement in water quality (Schlesser, 1989). The wastewater treatment facility at Bloomfield Manor is being upgraded and this should further improve water quality of the stream. The slender madtom, a fish on the state's endangered species list has been found here (Fago, 1982).

Sudan Branch

Sudan Branch is a tributary to the Mineral Point Branch in Iowa County. It is considered a warm water sport fishery stream and is being managed for smallmouth bass. It appears that the smallmouth bass population may be declining, similar to what other smallmouth streams in southwest Wisconsin are experiencing. The reach of the stream near Linden may have the potential to be trout water (WDNR, 1992-93[2]).

Ludden Lake

Ludden Lake is an impoundment on the Mineral Point Branch near Mineral Point. We have no water quality data for the lake, though we assume water quality to be poor and similar to that of other impoundments in the driftless area of southwestern Wisconsin (Marshall, 1988). Use of the lake is limited by poor public access. Property owners around the lake have formed a lake district as a first step in addressing water quality

and lake use issues. The dam that forms the lake was repaired in 1993. No entity has taken responsibility for ownership of the dam at this writing, but that issue is expected to be resolved in 1994.

Table 12. Mineral Point and Sudan Branches Watershed (SP09) COUNTIES: Iowa and Lafayette SQUARE MILES: 110

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Brewery Creek	5	LAL/5[c]	COLD	Not-5	M	LAL	PSI,NPS/HAB,HM, pH,TURB	N/R	L	1,10,21,23,28
Furnace Creek	0-2	Unk	Unk			DEF	NPS/HAB,SED	N/R	L	1,21,28
	2-5	LAL/3[c]		Not-3	M	LAL	PSI,NPS/HAB,HM			
Mineral Point Branch	29	WWSF/29[a]	same	part-29	E	WWSF	NPS/HAB,SED	N/R	NR	1,2,15,28
Pedler Creek	0-9.3	WWSF/9.3	same	not-9.3	E	WWSF	NPS/HAB,SED	N/R	NR	1,22,24,28
	9.3-10	WWFF/0.7[e]	same	part-0.7	E	LFF[d]				
Rock Branch	0-3	COLD/3[b] Class II	same	part-3	E	COLD	NPS/HAB,SED	R	NR	1,3,28
	3-3	Unk	UNK			DEF				
Sudan Branch	0-13.2	WWSF/13.2[a]	same			WWSF	NPS/HAB,SED	N/R	NR	1,2,3,28
	13.2-18	COLD/4.8[b] Class II	same	part-4.8	E	COLD	NPS/HAB,SED			
Unnamed trib to Sudan Br. 5N,2E, Sec 16	0-0.8	WWSF/0.8[a]	same			WWSF			NR	1
	0.8-4	Unk/3.2				DEF				
Unnamed streams (22)	51					DEF				
SUBTOTALS		COLD/9.8 WWSF/52.3 WWFF/0.7 LFF/0 LAL/8 UNK/56.2	COLD/14.8 WWSF/52.3 WWFF/0 LFF/0.7 LAL/0 UNK/59.2							

TOTAL STREAM MILES: 127

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the streams that no longer should be listed in NR 104 or ones that belong in NR 104 but are awaiting code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

UPPER WEST BRANCH PECATONICA RIVER (SP10)

The Upper West Branch Pecatonica River watershed, depicted with the Mineral Point and Sudan Branches Watershed map (above), is in southwestern Iowa and northwestern Lafayette counties. The principle land use in the watershed is agriculture, dominated by row crop cultivation. Two small permittees discharges to surface water in the watershed, the communities of Rewey and Cobb. This watershed is a recently completed nonpoint source priority watershed project. The project was less than successful due to lack of landowner participation. The *Upper West Branch Pecatonica River Priority Watershed Plan* detailed many of the problems caused by sources of polluted runoff in the watershed (WRM, 1982). The DNR did nonpoint source evaluation monitoring of sites in the watershed and concluded that the best management practices installed were effective in reducing agricultural nonpoint source pollution. A detailed report of the evaluation monitoring effort, *Upper West Branch Pecatonica River Priority Watershed Project: Bioassessment Final Report*, is available through the Bureau of Water Resources Management.

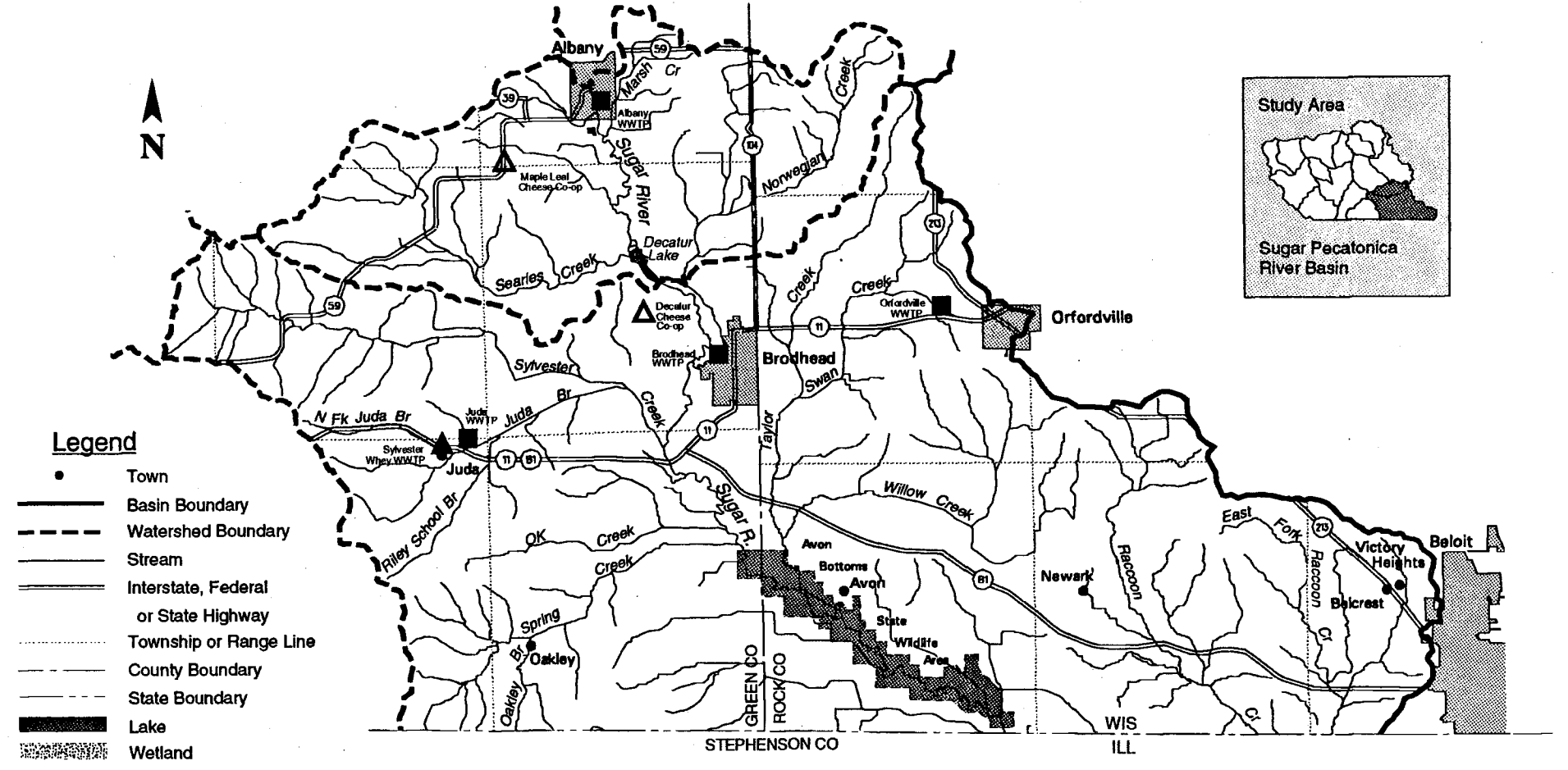
Table 13. Upper West Branch Pecatonica River Watershed (SP10) COUNTIES: Iowa, Lafayette SQUARE MILES: 77

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Jones Branch	0-2	COLD/2[b] Class II	same	part-2	E	COLD	NPS/SED,HAB		NA	3,25,28,32,36
	2-3.2	COLD/1.2[b] Class III	COLD Class II	part-1.2	E	COLD	NPS/SED,HAB			
Livingston Branch	11	WWSF/11[a]	same	part-11	M/E	WWSF	NPS/DO,HAB,SED NH_3,		NA	1,25,28,32,36
Pecatonica R. (W.Br.)	159.1-192.7	WWSF/33.6[a]	same	part/33.6	E	WWSF	NPS/HAB,SED		NA	25,28,32,36
	192.7-195.1	LFF/2.4[c]	COLD	not-2.4		LFF				
	195.1-196					DEF				
Williams-Rewey Br.	0-2.2	COLD/2.2[b] Class II	same	part-2.2	E	COLD	NPS/HAB,SED		NA	1,3,25,28,32,36
	2.2-3	LAL/0.8[c]	same	Full-0.8	E	LAL				
Unnamed streams (16)	19					DEF				
SUBTOTALS		COLD/5.4 WWSF/44.6 WWFF/0 LFF/2.4 LAL/0.8 UNK/19.9	COLD/7.8 WWSF/44.6 WWFF/0 LFF/0 LAL/0.8 UNK/19.9							

TOTAL STREAM MILES: 73.1

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update).
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Lower Sugar River (SP11) and Lower Middle Sugar River (SP12) Watersheds



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:220,000

Wastewater Treatment Plant Discharge

Municipal Discharge to:

- Surface Water
- Groundwater
- Both

Industrial Discharge to:

- Surface Water
- Groundwater
- Both

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

LOWER SUGAR RIVER (SP11)

The Lower Sugar River watershed in western Rock County and eastern Green County includes the reach of the Sugar River from the dam at Albany downstream to the Wisconsin-Illinois state line. The watershed is intensively agricultural. Three municipal wastewater treatment facilities discharge to surface waters in the watershed: Albany, Brodhead, and Orfordville. The Juda wastewater treatment facility discharges to groundwater. On industrial facility discharges to surface water: Sylvester Whey. Polluted runoff is the primary cause of water quality and in-stream habitat problems in the watershed, though one of the wastewater treatment facilities has presented problems.

Large, important floodplain wetland complexes exist along the Sugar River. These wetlands complexes have a high value for wildlife and water quality. Many of these wetlands are encompassed in the Avon Bottoms State Wildlife Area and Avon Bottoms State Natural Area in Rock County. Wetlands along streams in this watershed should be protected because there are so few wetlands in this region. Public acquisition of higher quality wetlands complexes should be considered a priority.

RECOMMENDATIONS

Management

1. County Zoning offices should vigorously enforce shoreland-wetland zoning ordinances (Type C).

Monitoring

2. Water Resources Management should conduct damage assessment monitoring on North Fork Juda Branch to determine the stream's response to the correction of permit violations and unpermitted discharges (Type B).

3. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Lower Sugar River watershed (Type B).

Nonpoint Source

4. The nonpoint source priority watershed selection committee should consider Raccoon Creek a high priority candidate for selection as a small-scale priority watershed project (Type B).

East Fork Raccoon Creek

This tributary to Raccoon Creek supports a warm water fishery (Eagan, 1988). Its could potentially support a cold water community. Basin assessment monitoring done in 1988 showed the stream suffered from problems due to agricultural runoff, particularly in its headwaters reach (Marshall, 1988[4]). The stream, which was recently added to the state's antidegradation list (NR 102) as an exceptional resource water (ERW), is buffered by wetlands for much of its length, including a very high quality floodplain forest with

springs. The least darter, redside dace, and redfin shiner, "special concern" species on Wisconsin's threatened and endangered list, have been found in the stream (Fago, 1982).

North Fork Juda Branch

This is a tributary of Juda Branch at the community of Juda. Extensive streambank erosion exists and small portions of the stream have been channelized. The stream's present biological use likely a limited forage fishery. It has the potential for a diverse forage fishery, perhaps even a limited trout fishery as trout have been reported in the stream (Marshall, 1992-92). Some small springs exist above Juda. In-stream habitat has been rated as poor, due to agricultural ditching and polluted runoff. An industrial discharger has also contributed to poor water quality in the stream (Marshall, 1988[4]).

In the past, unpermitted discharges and discharges which violated Wisconsin Pollutant Discharge Elimination System (WPDES) permit limits occurred from a whey processing plant. Hilsenhoff biotic index monitoring showed the discharges degraded water quality and in-stream habitat (Marshall and Vollrath, 1993). The state has taken legal action, which should lead to resolution of this problem and improvement in water quality in the stream.

Raccoon Creek

Raccoon Creek is considered a warm water sport fishery stream (Marshall, 1988). It is a good example of a stream in the basin that supports rare and diverse fish communities. Polluted runoff may be degrading stream water quality, but additional monitoring is necessary to identify and assess the sources and impacts. Biotic index monitoring in 1988 indicated water quality in the stream ranged from excellent to fair (Marshall, 1988). The stream was added to the state's antidegradation list in 1993 as an exceptional resource water (ERW). The least darter, redside dace, redfin shiner, and starhead topminnow, all "species of special concern" on Wisconsin's threatened and endangered species list, have been found in the stream (Fago, 1982). Raccoon Creek is buffered by a band of wetlands throughout much of its length. These wetlands appear to have a diverse wetland vegetation composition and probably have high functional values for wildlife as well as water quality. An undetermined area of wetlands within its sub-watershed have been drained and are cultivated annually. These wetlands complexes include a very high quality emergent aquatic, southern sedge meadow, wet prairie, and shrub-carr.

Sylvester Creek

Sylvester Creek is a tributary to the Sugar River in Green County. Four miles of its length in the upper reach of the stream are classified as Class III trout waters (WDNR, 1980). The stream was added to the state's antidegradation list in NR 102 as exceptional resource waters (ERW) in the spring of 1993. It has a diverse forage fish population (DNR, 1992-92[1]). The redfin shiner, a watch species fish, has also been found here (Fago, 1982). Much of the lower reach of the stream has been channelized, affecting habitat and water quality. Other sources of polluted runoff also affect water quality and habitat.

Table 14. Lower Sugar River Watershed (SP11) COUNTIES: Green and Rock SQUARE MILES: 214

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING POTENTIAL USE/MILES	USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
E.Fork Raccoon Creek	0-3 3-7	COLD/3[b] Class III	same	part-3	M	ERW DEF	NPS/HAB,SED	N/R	H	1,2,3,4,15,28
(Green Drainage System)	8.5	WWSF/8.5[e]	same	full-8.5	E	DEF		R	L	28
Juda Branch	8	WWSF/8[e]	same	part-8	M	DEF	NPS,PSI,HM/HAB,SED	R	M	26,28
N. Fork Juda Branch	3	LFF/3[d]	WWFF	not-3	M	LFF	NPS,PSI/HAB,	N/R	M	1,4,10,26,28
Oakley Branch	2	WWFF/2[e]	same	part-2	E	DEF	NPS/HAB,SED,TURB	R	NR	28
OK Creek	5	WWFF/5[e]	same	part-5	E	DEF	NPS,HM/HAB,TURB	R	NR	28
Raccoon Creek	11	WWFF/11[e]	same	part-11	M	ERW	NPS/HAB	N/R	H	1,2,4,15,28
Riley School Branch	4	WWFF/4[e]	same	part-4	M	DEF	NPS/HAB	R	M	4,28
Spring Creek	10	WWFF/10[e]	WWSF	not-10	E	DEF	NPS/SED,HAB	R	NR	28
Sugar River	10.7-29.1	WWSF/18.4	same	part-18.4	E,M	ERW/8,WWSF	NPS/HAB SED	R	L	1,15,28
Swan Creek	0-2 2-7	LFF/2[c] WWSF/5[e]	WWFF same	not-2 full-5	E E	LFF DEF	NPS,HM/HAB	R	NR	1,28
Sylvester Creek	0-8.4 8.4-12.4 12.4-14	WWSF/8.4[e] COLD/4[b] Class III	same same	part-8.4 part-4	E E	DEF ERW DEF	NPS,HM/HAB,SED NPS/HAB,SED	N/R	M	1,2,3,15,26,28
Taylor Creek	0-5.7 5.7-13	WWSF/5.7[e] WWFF/7.3[e]	same same	full-5.7 full-7.3	E E	DEF DEF		R	L	28
Willow Creek	0-3 3-10	WWSF/3[e] WWFF/7[e]	same same	full-3 full-7	E E	DEF DEF		R	L	28
Unnamed streams (19)	40					DEF				
SUBTOTALS		COLD/7 WWSF/57 WWFF/46.3 LFF/5 LAL/0 UNK/45.6	COLD/7 WWSF/57 WWFF/51.3 LFF/0 LAL/0 UNK/45.6							

TOTAL STREAM MILES: 160.9

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

LOWER MIDDLE SUGAR RIVER (SP12)

The Lower Middle Sugar River watershed, depicted in the map accompanying the Lower Sugar River watershed (above), is located in eastern Green County and a very small portion of Rock County. Agriculture is the predominant land use. Two permitted wastewater treatment facilities discharge to surface water in the watershed: the village of Albany and the city of Brodhead. A large wetland complex exists adjacent to the Sugar River in this watershed. Other large areas of wetlands have been drained and put into cultivation. The Sugar River in this watershed is considered to be exceptional resource waters (ERW) under the state's antidegradation rules.

RECOMMENDATIONS

Management

1. Water Resources Management, with the assistance of Water Regulation and Zoning, should investigate whether it's desirable and feasible to abandon the mill race on the Sugar River at Brodhead to return to a stream environment. (Type B).

Norwegian Creek

Norwegian Creek, a small stream tributary to the Sugar River above Brodhead, has a diverse forage fishery, though game fish may be found very near its mouth (Bush et.al., 1980). Much of the stream has been straightened. The least darter, a species on the state watch list, has been found in the stream (Fago, 1982). The stream has recently been added to the state's antidegradation list under administrative codes NR 102 as an Exceptional Resource Water (ERW). A narrow wetland buffer exists along the stream's lower reaches. Many of these wetland areas have been disturbed by grazing or prior farming. Other large areas of wetlands have been drained and put into cultivation.

Sugar River

The Sugar River in this reach is classified and managed as a warm water sport fishery, and possesses an excellent diversity of sport fish. The Green County reach was recently added to the state's antidegradation waters list as exceptional resource waters (ERW). One state threatened and one state watch species of clam are known to reside in this reach of the stream (WDNR, 1993[31]). The gravel chub, on the state's endangered species list, and the river redhorse, redfin shiner and the weed shiner, on the state's watch species list have also been found in this reach (Fago, 1982).

The dam on the Sugar River forming Decatur Lake is undergoing relicensing through the Federal Energy Regulatory Commission (FERC). One option that has been suggested for this dam is the abandonment of the three-mile mill race, to return a more stream-like environment instead of the lake environment that presently exists. This option requires a minimum flow of 40 cubic feet per second (cfs) to handle treated wastewater effluent from the Brodhead wastewater treatment plant (WDNR, 1993[26,31]). In an investigation of the desirability and feasibility of this option, studies should evaluate water quality, in-stream habitat, and fisheries of both the mill race and the main stem of the Sugar River.

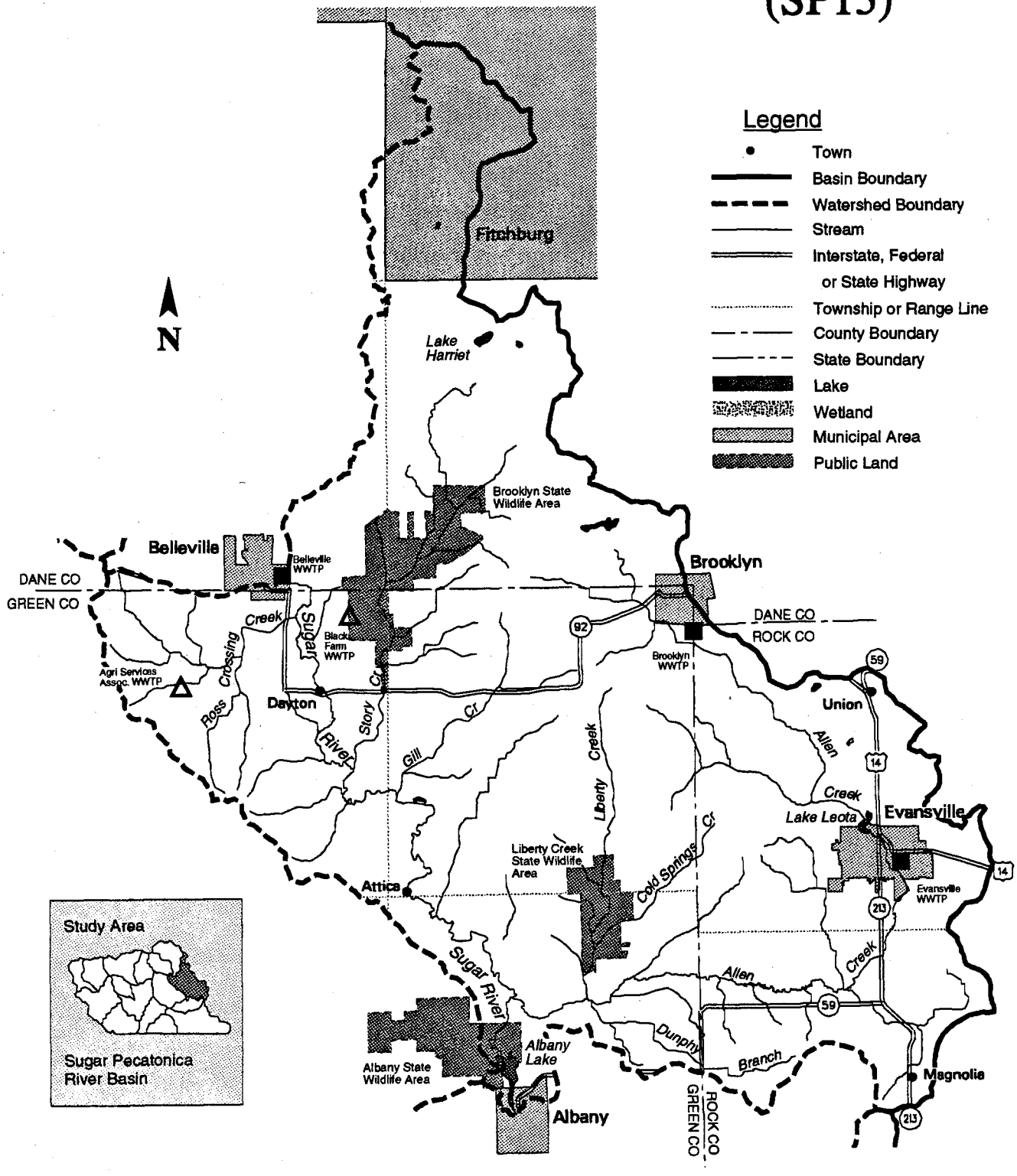
Table 15. Lower Middle Sugar River Watershed (SP12) COUNTIES: Green and Rock counties SQUARE MILES: 57

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING	BIOLOGICAL USE POTENTIAL	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Marsh Creek	0-2	COLD/2[b] Class III	same	full-2	E	COLD			NR	3
	2-3					DEF				
Norwegian Creek	6	WWSF/6[e]	same	part-6	E	ERW	NPS/HAB,SED	N	NR	1,15,28
Searles Creek	9	WWFF/9[e]	same/4.5	full-4.5	E	DEF			NR	28
			WWSF/4.5	not-4.5	E	DEF	NPS/HAB,SED			
Sugar River	29.1-38.9	WWSF/9.8	same	part-9.8	E	ERW	NPS/SED	N/R	NR	1,15
Unnamed streams (3)	9					DEF				
SUBTOTALS		COLD/3 WWSF/15.8 WWFF/9 LFF/0 LAL/0 UNK/9	COLD/3 WWSF/20.3 WWFF/4.5 LFF/0 LAL/0 UNK/9							

TOTAL STREAM MILES: 36.8

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Allen Creek and Middle Sugar River Watershed (SP13)



Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

Wastewater Treatment Plant Discharge

Municipal Discharge to:
- Surface Water
- Groundwater
- Both

Industrial Discharge to:
- Surface Water
- Groundwater
- Both

ALLEN CREEK AND MIDDLE SUGAR RIVER (SP13)

The Allen Creek and Middle Sugar River watershed is in northeast Green County, northwest Rock County and south Central Dane County. The dominant land use in the watershed is agriculture, though some low intensity urban development exists in the upper reaches of the watershed. Municipal wastewater treatment plant discharges to surface water in the watershed come from Belleville, Brooklyn and Evansville. We know little about existing water quality of streams in this watershed.

RECOMMENDATIONS

Management

1. Water Resources Management, Water Regulation and Zoning, and Fisheries Management, along with the village of Albany, should assess the feasibility and desirability of removing the dam creating Albany Lake (Types B,C).

2. The village of Brooklyn should adopt a construction site erosion control/stormwater management ordinance (Type C).

Monitoring

3. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Allen Creek and Middle Sugar River watershed (Type B).

Nonpoint Source

4. The nonpoint source priority watershed selection committee should consider Gill, Liberty, and Ross Crossing creeks high priority candidates for possible selection as small-scale nonpoint source priority watershed projects (Type B).

Allen Creek

Allen Creek rises in southern Dane County, flows through northwest Rock County and northeast Green County before emptying into the Sugar River. About 4.5 miles of the stream above Lake Leota are classified Class II and Class III trout waters (WDNR, 1980). Allen Creek below Evansville was recently added to the state's antidegradation list (NR 102) as an exceptional resource water (ERW), affording it a greater level of protection. The stream below Evansville has a very good, diverse warm water sport fishery. There is some public ownership along the stream south of Evansville.

Gill Creek

Gill Creek is a warm water forage fishery stream. It has the potential to support a cold water sport fishery but is limited by polluted runoff (Eagan, 1988). Gill Creek was recently added to the state's antidegradation list (NR 102) as an exceptional resource

water (ERW), affording it a greater level of protection.

Liberty Creek

Liberty Creek is classified as a Class II and Class III trout stream for about four miles of its length (WDNR, 1980). About 2.5 to three miles are within the Liberty Creek State Wildlife Area. A high quality wetlands complex exists adjacent to the creek. Liberty Creek was recently added to the state's antidegradation list (NR 102) as an exceptional resource water (ERW), affording it a greater level of protection. The least darter, a Wisconsin watch species fish, has been reported in this stream.

Ross Crossing Creek

Ross Crossing Creek is a warm water forage fishery with the potential to become a cold water sport fishery (Eagan, 1988). The redfin shiner, a fish on the Wisconsin watch list, has been found here (Fago, 1982). The stream was recently added to the state's antidegradation (NR 102) as an exceptional resource water (ERW), affording it a greater level of protection.

Albany Lake (Lake Winnetka)

This lake is an impoundment of the Sugar River at Albany. It has poor water quality, similar to other impoundments in the driftless area (Marshall, 1988[12]). This 102-acre lake has a drainage area of about 465 square miles. Sedimentation and turbidity impair uses of the lake. A best-case scenario for the Sugar River at Albany is that the dam be operated as "run of the river" dam, allowing much of the existing millpond to become a riverine wetland complex. The Albany State Wildlife Area borders the northwest corner of the lake.

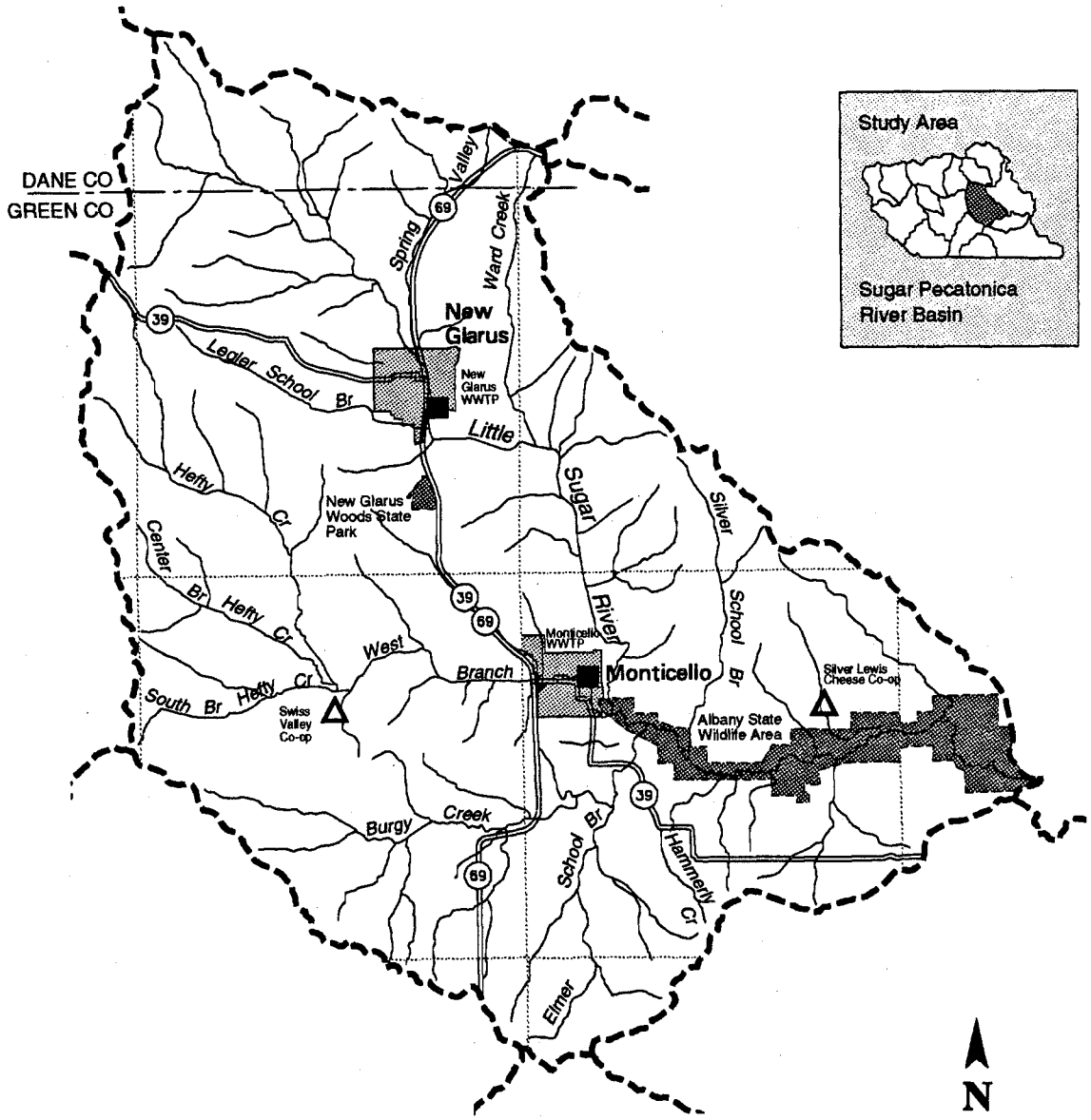
Table 16. Allen Creek and Middle Sugar River Watershed (SP13) COUNTIES: Dane, Green, Rock SQUARE MILES: 153

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Allen Creek	0-11	WWSF[a]/11	same	full-11	E	ERW		N/R	M	1,3,28
	11-16.1	COLD[c]/5.1	same	full-5.1	E	ERW				
	16.1-18.6	COLD[b]/2.5 Class II	same	part-2.5	E	COLD	NPS/HAB,SED			
	18.6-20.6	COLD[b]/2 Class III	same	part-2	E	COLD	NPS,BY/HAB,SED			
	20.6-26					DEF				
Cold Spring Creek	3	WWFF[c]/3	same	full-3	E	DEF		R	NR	28
Dunphy Branch	1	WWFF[c]/1	same	full-1	E	DEF		R	NR	28
Gill Creek	5	WWFF[c]/5	COLD/5	not-5	M	ERW	HM,NPS/HAB,SED	N/R	H	1,3,28
Liberty Creek	0-3	COLD[b]/3 Class III	same	full-3	E	ERW		N/R	H	1,3,28
	3-4	COLD[b]/1 Class II	same	full-1	E	ERW	"			
	4-9					ERW				
Ross Crossing Creek	4	WWFF[c]/4	COLD/4	not-4	M	ERW	HM,NPS/HAB,SED	N/R	H	1,28
Story Creek (Tipperary Creek)	0-6.6	COLD[b]/6.6 Class II	same	full-6.6	E	ERW		R	L	1,3,28
	6.6-11					DEF				
Sugar River	38.9-60.8	WWSF[a]/21.9	same	full-21.9	E	ERW		R	L	1,28
Trib to Story Creek (T4NR9E,s6)	5					DEF		R	NR	
Unnamed streams (8)	10					DEF				
SUBTOTALS		COLD/20.2 WWSF/32.9 WWFF/13 LFF/0 LAL/0 UNK/29.8	COLD/29.2 WWSF/32.9 WWFF/4 LFF/0 LAL/0 UNK/29.8							

TOTAL STREAM MILES: 95.9

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Little Sugar River Watershed (SP14)



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:

- Surface Water
- Groundwater
- Both

Industrial Discharge to:

- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:180,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

LITTLE SUGAR RIVER (SP14)

The Little Sugar River watershed lies in north central Green County and a very small portion of southern Dane County. Agricultural land uses dominate, especially dairying, cash crops, and feeder operations. Two municipal wastewater treatment plants discharge to surface water in the watershed: New Glarus and Monticello. New Glarus is the beginning of the Sugar River State bicycle trail which parallels the Little Sugar River and Sugar River from New Glarus to Brodhead.

RECOMMENDATIONS

Management

1. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Little Sugar River watershed (Type B).

2. The village of New Glarus should identify opportunities and take measures to protect the Little Sugar River such measures as enacting and enforcing a stormwater management ordinance, improved enforcement of construction site erosion control provisions, and acquisition of parkland and natural areas adjacent the Little Sugar River and along drainageways leading to the river (Type C).

Burgy Creek

Burgy Creek is a tributary to the West Branch Sugar River below Monticello. It's existing biological use is as a warm water forage fishery. Though it has a diverse forage fishery (WDNR, 1992-93[1]), it has the potential to be a trout stream. Historically, brook trout were found in the upper reaches (Bush, 1980). Stream channel ditching, runoff from farm fields, and streambank grazing have resulted in siltation in the stream (Marshall, 1988). Burgy Creek was added to the state's exceptional resource waters (ERW) list under administrative codes NR 102 and NR 207, the state's antidegradation rule.

Little Sugar River

The Little Sugar River rises in southwest Dane County and flows southeasterly to the Sugar River at the Albany millpond. The river above New Glarus is a Class II trout stream (DNR, 1980) and is considered an exceptional resource water (ERW) under NR 102 and NR 207, the state's antidegradation rule. Below New Glarus the stream becomes wider. Some larger wetland complexes exist adjacent to the stream, which both buffer the stream and provide important wetlands functional values. Other wetland areas have been drained and put into agricultural production. Much of the remaining wetland area is in the Albany State Wildlife Area. There are potential sources of polluted runoff, but their impacts on the stream are unevaluated. The New Glarus wastewater treatment plant has had problems meeting its Wisconsin Pollutant Discharge Elimination System (WPDES) permit limits. The village is building a new facility which should eliminate water quality problems caused by the old facility (DNR, 1992-93[26]).

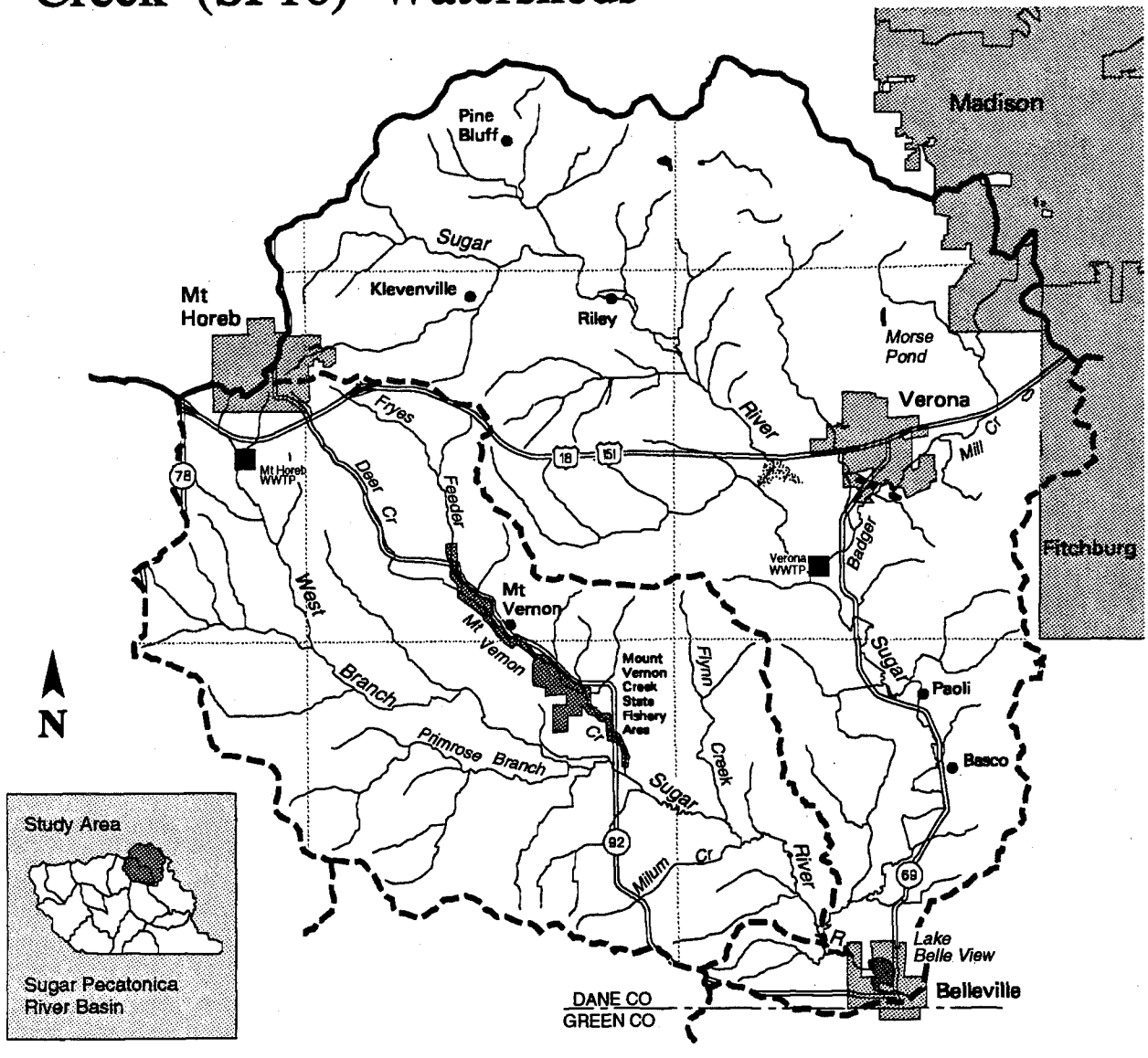
Table 17. Little Sugar River Watershed (SP14) COUNTIES: Dane and Green Counties SQUARE MILES: 135

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Burgy Creek	10	WWFF[e]/10	COLD/10	not-10	M	ERW	NPS,HM/HAB,SED,TEMP	N/R	H	1,2,3,4,28
Elmer School Branch	4	WWFF[e]/4	same	full-4	E	DEF		R	NR	28
Hammerly Creek	0-1	COLD[e]/1 Class III	COLD/1 Class II	not-1	E	COLD	NPS,HM/HAB,SED,TEMP	R	NR	3,28
	1-3					DEF				
Hefty Creek	0-8.5	COLD[b]/8.5 Class III	same	full-8.5	E	ERW		R	NR	1,3,28
	8.5-11					DEF				
Hefty Creek, Center Br.	0-4.2	COLD[b]/4.2 Class III	same	full-4.2	E	ERW		R	NR	1,3,28
	4.2-5					DEF				
Hefty Creek, South Br.	3.3	COLD[b]/3.3	same	full-3.3	E	COLD		R	NR	3,28
(Hustad Valley Creek)	4	WWFF[e]/4	same	full-4	E	DEF		R	NR	28
(Krieg Valley Creek)	2	WWFF[e]/2	same	full-2	E	DEF		R	NR	28
Legler School Branch	9	LFF[e]/9	WWFF/9	not-9	E	DEF	NPS/HAB	R	NR	28
Little Sugar River	0-19	WWSF[a]/19	same/19	part-19	E	WWSF	NPS/SED,HAB	N/R	NR	1,3,28
	19-25	COLD[b]/6 Class II	same	part-6	E	ERW	"			
	25-28					DEF				
Little Sugar R., West Branch	0-6	WWSF[e]/6	same	full-6	E	DEF		R	NR	1,3,28
	6-6.6	COLD[e]/0.6 Class III	same	full-0.6	E	DEF				
(Pioneer Valley Creek)	5	LFF[e]/5	WWFF/5	not-5	E	DEF	NPS/HAB,SED	R	NR	28
Silver School Branch	3	WWFF[e]/3	COLD/3	not-3	E	DEF	NPS,HM/SED,HAB	R	NR	28
Spring Valley Creek	5	WWFF[e]/5	same	full-5	E	ERW		R	NR	1,28
Ward Creek	0-2	COLD[b]/2 Class III	same	full-2	E	ERW		R	NR	1,28
	2-4					DEF				
Unnamed streams (16)	28					DEF				
SUBTOTALS		COLD/27.6 WWSF/25 WWFF/28 LFF/14 LAL/0 UNK/36.3	COLD/40.6 WWSF/25 WWFF/29 LFF/0 LAL/0 UNK/36.3							

TOTAL STREAM MILES: 130.9

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

Upper Sugar River (SP15) and West Branch Sugar River and Mount Vernon Creek (SP16) Watersheds



Legend

- Town
- Basin Boundary
- Watershed Boundary
- Stream
- Interstate, Federal or State Highway
- Township or Range Line
- County Boundary
- State Boundary
- Lake
- Wetland
- Municipal Area
- Public Land

Wastewater Treatment Plant Discharge

Municipal Discharge to:
- Surface Water
- Groundwater
- Both

Industrial Discharge to:
- Surface Water
- Groundwater
- Both

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Kilometers

Scale 1:180,000

Wisconsin Department of Natural Resources
BIM-GEO Services Section
April, 1993

UPPER SUGAR RIVER (SP15)

The Upper Sugar River Watershed lies in southwestern Dane County. The only permitted wastewater treatment facility discharging to the stream is in Verona, although a portion of the southwest side of Madison is also in the watershed. The area around Verona and Madison is experiencing rapid urban development. This puts pressure on both surface water and groundwater resources in the watershed.

A major water resources concern is the diversion of groundwater from the Sugar River basin to the Lower Rock River basin. This is the result of the city of Madison groundwater pumpage on the city's southwest side for public water supply and subsequent treatment of wastewater at Madison Metropolitan Sewerage District Nine Springs facility. Continued or increased groundwater diversion by Madison and Verona, and the eventual connection of Verona to the Madison Metropolitan Sewerage District may lead to the reduction of base flow in the Sugar River and Badger Mill Creek, affecting water quality and in-stream habitat (DCRPC, 1993[7]). A regional groundwater study is under way to try to determine what effect groundwater diversion may actually be on base flow. This issue is discussed in more detail in the Point Source Report section on Verona, later in this document.

The portion of the watershed above Riley was part of a U.S. Soil Conservation Service P.L. 566 watershed plan, which began in 1981. The goals of the plan were to provide watershed protection, improve water quality, and enhance fish and wildlife habitat (DCRPC, 1981[8]). An evaluation of the project, *Upper Sugar River Watershed Plan Evaluation Report*, is available through the Dane County Land Conservation Department (Barthel, 1990).

RECOMMENDATIONS

Management

1. Water Resources Management and/or Water Regulation and Zoning should remove the dam on the Sugar River at Paoli, if feasible (Type B).

2. The University of Wisconsin should conduct a study of the long-term impact of golf course operation on the water quality and aquatic life of Morse Pond, as requested by the DNR in 1990 (Type C).

3. The cities of Madison and Verona, and Dane County should enact **and strictly enforce** strong stormwater management ordinances and long-range land use planning to protect the water quality, in-stream habitat and fisheries of Badger Mill Creek and the Sugar River (Type C).

4. DNR's Bureau of Wastewater Management, through the stormwater permitting process, should take measures to assure that the city of Madison adequately addresses water quality problems affecting Badger Mill Creek and, potentially, the Sugar River (Type B).

Monitoring

5. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the Upper Sugar River watershed (Type B).

6. Water Resources Management should establish an ambient monitoring station on the Sugar River above the present Verona wastewater treatment plant outfall (Type B).

Nonpoint Source

7. The nonpoint source priority watershed selection committee should consider the Upper Sugar River watershed a high priority candidate for possible selection as a nonpoint source water pollution abatement program priority watershed project (Type B).

8. The city of Verona should identify opportunities and take measures to protect the Sugar River and Badger Mill Creek, including acquisition of parkland and natural areas adjacent the Sugar River, Badger Mill Creek and along drainageways leading to the river, as well as developing a comprehensive storm water management plan that will assist city officials and local developers in better managing growth (Type C).

Badger Mill Creek

Badger Mill Creek is a tributary to the Sugar River near Verona. The perennial reach of the stream begins in a wetland west of Goose Pond between Madison and Verona. At one time, water quality in the creek was rated poor due to inadequately treated municipal and industrial wastewater discharged to it. Since 1978, these discharges have been eliminated or diverted. As a result, water quality and in-stream habitat have improved. The stream has been reclassified from supporting a limited forage fishery to supporting a warm water forage fishery (Marshall, 1989[14]). Trout have been found in the stream below Verona. The Dane County Conservation League has sponsored extensive streambank fencing and protection projects on the creek (Wells, 1994). It has been proposed to discharge treated effluent from a closed Dane County landfill to the creek. As of May, 1994, no final decision on whether or not to allow this discharge had been made. No evaluation of the effect of such a discharge on stream water quality, habitat, and fisheries has been conducted.

The creek's drainage area includes much of the southwest side of Madison as well as most of Verona. Urban runoff poses a significant threat to Badger Mill Creek. Rapid urban development in Madison and Verona, coupled with poor or non-existent construction site erosion control and stormwater management threatens water quality and habitat of the creek and the wetlands associated with it (WDNR, 1992-93[1]). Urban growth has already increased peak stormwater runoff and flows from impervious surfaces. Increased amounts of sediment and other pollutants entering Badger Mill Creek and ultimately the Sugar River can be expected if Madison, Verona, and Dane County do not take appropriate action. If no action is taken, in 20 years Badger Mill Creek could become nothing more than a stormwater conduit to the Sugar River for the

cities of Madison and Verona. Stormwater planning for this area should include addressing reduction of peak runoff rates from existing developed areas as well as keeping runoff rates from future developments at the pre-development runoff rate.

(Henry Creek)

Henry Creek is a very small spring fed tributary to the Sugar River near the community of Basco. The creek likely has good water quality and fair in-stream habitat (Marshall, 1988), with the potential to support trout (Marshall, 1988), although siltation and the level of stream flow are problems. The stream runs through a small wetland that is part of the larger Sugar River wetland complex. These wetlands serve an important function as a buffer for the Sugar River, as well as for wildlife, fisheries, and aesthetic values.

(Schlapbach Creek)

Schlapbach Creek rises near the northeast corner of the village of Mount Horeb and flows easterly to the Sugar River. The stream is spring fed and has good water quality based on biotic index ratings (Marshall, 1988). In-stream habitat rates only fair due to sedimentation from intense grazing of streambanks and runoff from croplands. If these sources of polluted runoff were controlled, the stream has the potential to be a trout stream (Marshall, 1988). Schlapbach Creek has been nominated for Exceptional Resource Water (ERW) status under the state's antidegradation rules in NR 102 and NR 207.

Sugar River

The reach of the Sugar River in this watershed runs from the dam at Belleville to the headwaters of the river northeast of Mt. Horeb. The Belleville dam and one at Paoli impede fish migration. Water quality in this reach of the river has gradually improved (WDNR, 1992-93,[1]). The stream's classification was recently upgraded to supporting a cold water sport fishery from the headwaters to the Frenchtown Road bridge above Lake Belle View (Marshall and Stewart, 1993). Water quality in the river is considered generally good. High fecal coliform levels in the stream are a concern (DCRPC, 1992,[6]). Urban and agricultural sources of polluted runoff are likely sources of water quality problems. Runoff from farm fields, streets and parking lots, construction sites, and barnyards, intense grazing adjacent to the stream and streambank erosion are adding sediments and pollutants to the stream and degrading habitat and water quality.

Large wetland complexes exist adjacent to the Sugar River. Other wetland areas have been drained and put into agricultural production. Wetland drainage and stream straightening in some locations has also degraded habitat and water quality.

Urban sources of polluted runoff do not yet appear to be harming water quality or in-stream habitat of the Sugar River. But threats to water quality increase with continued urban growth in the Madison-Verona area. The U.S. Highway 18-151 Verona bypass and reconstruction, coupled with the addition of Verona to the Madison Metropolitan Sewerage District, likely will accelerate urban growth in this area. This could lead to increased water quality problems unless appropriate and proper land use planning measures and ordinances are enacted and enforced. Groundwater diversion, mentioned above, also poses a threat to water quality and in-stream and riparian habitat. Long-

term, cumulative effects of urbanization on water quality and in-stream habitat of the upper reaches of the Sugar River are a major concern of DNR staff. The tools and responsibility for addressing long-term management of Sugar River water quality rests with Dane County and the municipalities in the watershed. It is conceivable that if the present rapid urban growth in this area continues unchecked, water quality, fisheries and in-stream habitat may be significantly degraded as a result of lowered groundwater base flow to the river.

The entire stretch of the Sugar River within this watershed is classified as Exceptional Resource Waters (ERW) under the state's antidegradation rules, NR 102 and NR 207.

Lake Belle View

Lake Belle View is a shallow impoundment of the Sugar River at the village of Belleville in southern Dane County. The lake suffers from the water quality problems usually associated with impoundments, including sedimentation, turbidity, excessive rooted aquatic plants and attached algae, free floating bluegreen algae, water level fluctuations, fish winterkills and rough fish (Marshall, 1988[12]). Lake Belle View was drawn done in 1992 for dam repair. The village of Belleville is trying to develop a lake "renewal" project which would include some dredging (Van Vlack, 1992). A proposal was made to dredge the lake in 1989, but the costs were too high. Southern District staff concluded at that time that dredging would not be a long-term solution to the lake's water quality problems. The best-case scenario for the millpond at Belleville is that the water quality of the lake would only be as good as that of the Sugar River (WDNR, 1992-93[1]). The best-case scenario for the Sugar River at Belleville is that the dam be operated as "run of the river" dam, allowing much of the existing millpond to become a riverine wetland complex.

Morse Pond

Morse Pond is a small, shallow pothole pond on the edge of the driftless region west of Madison. The pond is unique in that it has a large bed of lotus (*Nelumbo lutea*) not found on many other waterbodies in the Sugar-Pecatonica basin. Construction of the University of Wisconsin golf course resulted in excessive sediment entering the pond during storm runoff (WDNR,1992-93[1]). Completion of the golf course has reduced the sedimentation problem, but the lotus beds are threatened by nutrients and herbicides washing off the golf course into the pond. The University of Wisconsin Foundation had agreed to initiate a study of long-term impacts of golf course operations on water quality and aquatic life in Morse Pond, but nothing has been done.

Table 18. Upper Sugar River Watershed (SP15) COUNTIES: Dane SQUARE MILES:88

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Badger Mill Creek	0-2	COLD[e]/2	same	part-2	M	LFF[d]	NPS,HM,URB/SED,HAB	N/R	H	1,2,7,14,26,39
	2-5					DEF				
(Henry Creek)	1	WWFF[e]/1	COLD/1	Not-1	M	DEF	NPS/SED,HAB	N/R	M	4,28
(Rhiner Creek)	5					DEF	HM,NPS/	R	NR	
(Schlapbach Creek)	4	WWFF[e]/4	same/3	part-3	M	ERW	NPS/HAB,SED	R	H	1,4,8,9,16,28
			COLD/1	not-1	M	ERW	"			
Sugar River	60.8-70.4	WWSF[e]/9.6	same	part-9.6	M	ERW	NPS/BAC,HAB,SED,TURB	N/R	H	1,2,7,8,9,10,27
	70.4-76.4	COLD[e]/6	same	part-6	M	ERW	"			
	76.4-91	WWFF[e]/14.6	same	part-14.6	M	ERW	"			
Unnamed streams (3)	8					DEF				
SUBTOTALS		COLD/8	COLD/9							
		WWSF/9.6	WWSF/9.6							
		WWFF/19.6	WWFF/18.6							
		LFF/0	LFF/0							
		LAL/0	LAL/0							
		UNK/16	UNK/16							

TOTAL STREAM MILES: 53.2

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

WEST BRANCH SUGAR RIVER AND MOUNT VERNON CREEK (SP16)

This watershed in southwestern Dane County is depicted on the same map as the Upper Sugar River (above). The watershed is dominated by agricultural land uses. The Mount Horeb wastewater treatment plant is the only permitted facility discharging effluent to surface waters in the watershed. Mount Horeb is a "bedroom community" in the Madison metropolitan area. It will likely continue to experience significant population growth over the next 20 years, affecting the life of the present wastewater treatment plant. This growth may also degrade water quality and in-stream habitat in the upper reaches of the West Branch Sugar River and Deer Creek.

The community of Mount Vernon is an unsewered residential area in the watershed. Failing septic systems in Mount Vernon may be degrading water quality in this reach of the stream. Part of the watershed was in a U.S. Soil Conservation Service P.L. 566 watershed plan, which began in 1981. The goals of the plan were to provide watershed protection, improve water quality, and enhance fish and wildlife habitat (Dane County, 1981-8). A 1990 evaluation of the project stated the project "partially achieved its purpose" (Barthel, 1990).

RECOMMENDATIONS

Management

1. The village of Mount Horeb, with the assistance of the Dane County Regional Planning Commission, should develop long-range storm water management plans to adequately protect the headwaters areas of the West Branch Sugar River and Deer Creek from degraded water quality resulting from urban development (Type C).

Monitoring

2. Water Resources Management should conduct condition monitoring as part of basin assessment monitoring for the West Branch Sugar River and Mt. Vernon Creek watershed (Type B).

Nonpoint Source

3. The nonpoint source priority watershed selection committee should consider the West Branch Sugar River and Mt. Vernon Creek watershed a high priority candidate for possible selection as a nonpoint source water pollution abatement program priority watershed project (Type B).

Deer Creek

Deer Creek rises on the southeast edge of Mount Horeb and flows southeast, joining with Fryes Feeder to become Mount Vernon Creek. Its current use classification is for support of a warm water forage fishery, although it could potential support a trout fishery (WDNR, 1992[1]). Brown and brook trout have been found in Deer Creek (DNR, 1993[2]). This stream was part of the P.L. 566 project area. Water quality problems

identified included runoff from barnyards and cultivated fields, and excessive grazing. Habitat improvement projects occurred at sites along the stream, which helped the trout fishery in the stream. Biotic index monitoring in 1990 did not, however, demonstrate water quality improvements (WDNR, 1992[1]). One "bad actor" along the stream may have offset all the improvements made in the Deer Creek sub-watershed.

Increased residential development is occurring along Deer Creek. Such development may have a long-term cumulative impact on water quality and fishery of the creek. Improved water quality and in-stream habitat in Deer Creek are vital to the protection of Mount Vernon Creek. Redside dace, a watch species fish, is found in the stream (Fago, 1982). Deer Creek is an Exceptional Resource Water stream under the state's antidegradation rules.

Flynn Creek

Flynn Creek is a tributary to the West Branch Sugar River. Approximately 2.5 miles of it is classified as Class II trout waters (WDNR, 1980). Biotic index data collected in 1986 and 1987 showed water quality ranging from very good to fairly poor. Stream habitat rated fair. Runoff from croplands and pastures causes siltation in the stream. Redside dace, a watch species fish, occur in the stream (Fago, 1982). Flynn Creek is an Exceptional Resource Water stream under the state's antidegradation rules.

Fryes Feeder

Fryes Feeder joins with Deer Creek to form Mount Vernon Creek. About 1.5 miles of its length are classified as a Class II trout stream (WDNR, 1980). Biotic index data from May of 1990 indicates the stream has very good water quality (Barthel, 1990). Fryes Feeder is an Exceptional Resource Water stream under the state's antidegradation rules.

Milum Creek

Milum Creek is a small tributary to the West Branch Sugar River. Its current use classification indicates it supports a warm water forage fishery, but it could potentially support a cold water sport fishery. Data from 1986 and 1987 indicate poor in-stream habitat, but water quality ranged from good to very good (Marshall, 1988[4]). Siltation from cropland erosion seems to be the primary problem limiting water quality. Redside dace, a watch species fish, are found in the stream (Fago, 1982). Milum Creek is an Exceptional Resource Water stream under the state's antidegradation rules.

Mount Vernon Creek

Mount Vernon Creek is classified as a trout stream for its entire length. About four of its almost eight miles are Class I trout waters, with the remainder rated Class II (WDNR, 1980). The Class I portion of the stream has been elevated to outstanding resource water (ORW) status, providing it with a higher level of protection. The remainder of the stream is classified as Exceptional Resource Waters under the state's antidegradation rules. Sources of polluted runoff threaten parts of this stream, but the total extent of the threat has not been evaluated. Increased nitrate concentrations have been documented, apparently directly related to agricultural changes in the watershed (Mason et.al., 1990). The unincorporated community of Mount Vernon is located on the Class I portion of the

creek. The community uses individual septic systems to handle its wastewater. Many of these systems are suspected of failing and may be degrading water quality in Mount Vernon Creek.

West Branch Sugar River

The West Branch of the Sugar River rises near the southwest limits of the village of Mount Horeb. Approximately 5.5 miles are classified Class II trout waters (WDNR, 1980). Upstream of the trout reach, the stream is classified as supporting a diverse forage fishery (Marshall, 1988[36]). Sources of polluted runoff have likely degraded water quality and in-stream habitat in the West Branch. Hilsenhoff biotic index monitoring done in 1990 indicated a decrease in water quality due to organic pollution (Barthel, 1990).

Table 19. West Branch Sugar River and Mount Vernon Creek Watershed (SP16) COUNTIES: Dane SQUARE MILES: 67

NAME OF STREAM	LENGTH (MILES)	BIOLOGICAL USE EXISTING USE/MILES	BIOLOGICAL USE POTENTIAL USE/MILES	SUPPORTING POTENTIAL USE FULLY-PART-NOT-THR (MILES)	ASSES. CATEG. M OR E	STREAM CLASS	USE PROBLEMS SOURCE/IMPACT	NARR/ RECS	NPS RANK	REFERENCES
Deer Creek	5	WWFF/5[e]	same/1	part-1	M	ERW	NPS/HAB,SED	N/R	H	1,2,8,9,15, 16,28,39
			COLD/4	part-4	M	ERW	NPS/HAB,SED			
Flynn Creek	0-2.5	COLD[b]/2.5 Class II	same	part-2.5	M	ERW	NPS/HAB,SED	N/R	H	1,2,3,4,8,9,15,16
	2.5-5					ERW				
Fryes Feeder	0-1.5	COLD[b]/1.5 Class II	same	part-1.5	M	ERW	NPS/HAB,SED	N/R	H	1,3,8,9,16
	1.5-4					ERW				
Milum Creek	2	WWFF[e]/2	same	part-2	M	ERW	NPS/HAB,SED	N/R	H	1,4,16,28
Mt. Vernon Creek	0-4	COLD[b]/4	same	THR-4	M	ERW	NPS/HAB,SED	N/R	H	1,2,3,8,9, 16,28,39
	4-6	Class II COLD[b]/2 Class I	same	full-2	M	ORW	NPS,PSM/HAB			
Primrose Branch	0-2	COLD[b]/2 Class II	same	part-2	M	COLD	HM,NPS/HAB,SED	R	M	1,3
	2-5	WWSF[e]/3	same	full-3	E	DEF				
West Branch Sugar R.	0-2.5	WWSF[e]/2.5	same		E	DEF	NPS/HAB,SED	N/R	M	1,3,8,9,16,36
	2.5-8	COLD[b]/5.5 Class II	same	part-5.5	M	COLD	NPS,HM/BAC,HAB,SED			
	8-21	WWFF[e]/13	same	part-13	M	WWFF	NPS/HAB			
Unnamed streams (6)	13					DEF				
SUBTOTALS		COLD/17.5 WWSF/5.5 WWFF/20 LFF/0 LAL/0 UNK/19	COLD/21.5 WWSF/5.5 WWFF/16 LFF/0 LAL/0 UNK/19							

TOTAL STREAM MILES: 62

[a]A formal use classification (COLD, WWSF, WWFF) published by the department. This is the legal use classification even though it does not appear in the codes at this time.
[b]Trout stream identified in the "blue" Wisconsin Trout Streams book (DNR, 1980).
[c]A formal variance use classification published by the department and correctly listed in NR 104.
[d]A formal variance use classification published by the department and incorrectly or not listed in NR 104. These are the stream which no longer should be listed in NR 104 or ones that belong in NR 104 but are waiting for code update.
[e]Recent studies or the professional judgment of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is now meeting or has the potential to meet.

POINT SOURCE REPORT

In Wisconsin, wastewater treatment plants (WWTPs) and other wastewater discharges are regulated through the Wisconsin Pollutant Discharge Elimination System (WPDES) permits administered by the DNR. Regulated discharges include both municipal and industrial treatment plant effluent and residual wastes (sludge). This plan's recommendations are consistent with the provisions of this regulatory system.

Point sources of discharge, both municipal and industrial, are no longer the water quality problem they once were in the Sugar-Pecatonica Rivers basin. This is due to a number of factors, including millions of public tax dollars spent on improving existing facilities and building new ones; the compliance maintenance program requiring municipal facilities to evaluate plant performance yearly; screening for potential toxic substances in wastewater effluent and other toxic substance programs to reduce the amounts of toxic materials released into surface water; and regular inspections by DNR district wastewater management engineers. Individual facilities may have occasional or even persistent problems, but these are addressed through the various programs and procedures of the wastewater management program.

Information about municipal wastewater treatment plants, including receiving water, receiving water classification, stream low flow ($Q_{7,10}$), and a summary of management recommendations that apply to WWTPs in the basin are summarized in Table 20. Summary of recommendations that apply to industrial WPDES-permitted discharges are listed in Table 21, along with other pertinent information for the facility. Written narratives for municipal and industrial facilities were provided only where necessary. Refer to the Surface Water Quality Report for more information on the streams receiving discharges.

INFORMATION ON MUNICIPAL AND INDUSTRIAL POINT SOURCES

Point sources can be categorized by public or private ownership and type of waste treated. Waste is usually typified as domestic or industrial. Municipal wastewater treatment plants treat primarily domestic wastewater. While most are run by villages or cities, some are run by special purpose units of government such as sanitary districts or sewerage commissions. Other "municipal" sources can be run by county, state, or federal units of government. Still others such as truck stops, resorts, and nursing homes may be privately owned. Industrial WWTPs are usually privately owned. However, some publicly owned facilities such as drinking water treatment plants and electrical-generating stations also discharge industrial wastewater.

Most municipal dischargers in the Sugar-Pecatonica Rivers basin are in compliance with their WPDES permits and are in good operating condition. There is no municipal discharger in the basin causing a serious water quality problem. Many facilities have undertaken improvements in facilities and operation which keep them in compliance with their permits. The Compliance Maintenance Annual Report (CMAR), which each municipal facility is required to submit, summarizes how the plant has been operating in the last year.

This section contains a summary of municipal dischargers and those industries with WPDES permits for discharging process wastewater. Information on all industrial dischargers which have WPDES permits is provided in Table 21. Industries with general WPDES permits are not listed.

Dane County Regional Planning Commission

The Dane County Regional Planning Commission is the designated water quality planning agency for Dane County. Additional information on municipal dischargers in the Wisconsin River basin portion of Dane County can be found in Appendix C of the *Dane County Water Quality Plan*. That plan should also be consulted for additional recommendations for point source dischargers in Dane County.

Municipal Point Source Summary

For each permitted municipal treatment facility in the basin, Table 20 lists the name, watershed number, WPDES permit number, permit expiration date, receiving water type (see below), the classification of the stream (see below), the $Q_{7,10}$ in cubic feet per second (see below) design flow in million gallons per day, treatment action required (see below) and recommendations.

Receiving Water Information

For surface water discharges, the name of the receiving water is that indicated on U.S. Geological Survey topographic maps, unless the name has been formally changed by the Wisconsin Geographical Names Council.

The receiving water for all seepage cell lagoons, ridge and furrow systems, land spreading, spray irrigation, and similar land disposal systems is indicated as groundwater.

Classification

The following abbreviations are used to indicate the water quality standard designation (classification) for streams as defined in NR 102(04)(3a) and as described in more detail in the Surface Water Quality Report:

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

WWSF: Warm Water Sport Fish Communities; includes surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish.

WWFF: Warm Water Forage Fish Communities; includes surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.

LFF: Limited Forage Fish Community (intermediate surface waters);

includes surface waters of limited capacity because of low flow, naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of tolerant forage fish and other aquatic life.

LAL: Limited Aquatic Life (marginal surface waters); includes surface waters of severely limited capacity because of low flow and naturally poor water quality or poor habitat. These surface waters are capable of supporting only a limited community of aquatic life.

DEF: Streams that have not been formally classified are assumed to meet the Clean Water Goals of supporting aquatic life and recreation.

The $Q_{7, 10}$ is the 7-day mean flow below which the flow will fall an average of once in 10 years. It is used to indicate critical conditions that effluent limits must be designed to meet. Values are obtained from U.S. Geological Survey publications (Water Resources Investigations 79-31, 1971). In cases where values were not published, they were provided by the USGS (B.K. Holmstrom; personal communication).

Treatment Required

This indicates the basis on which effluent limits are determined. One or more of the following treatment actions are indicated:

CAT Categorical (Industrial only)
WQB Water Quality Based
SEC Secondary (Municipal only)
INT Limited Forage Fishery-Intermediate (Municipal only)
MAR Limited Aquatic Life-Marginal (Municipal only)
WLA Waste Load Allocated
LD Land Disposal
F&D Fill and Draw
O Other

Recommendations

Recommendations have been made for those facilities where the DNR should conduct monitoring or reevaluate WPDES permit conditions. These recommendations follow the individual municipal summaries. General recommendations for municipal sewage treatment in the basin, if any, are made at the completion of this section.

In the Surface Water Quality Report, surface water monitoring results were reviewed to identify possible toxic water quality problem areas. Most of the information available on toxins is either from the state's Ambient Water Quality Monitoring Network or the Fish Tissue Monitoring Program. Recommendations related to in-stream toxic monitoring are summarized in the Recommendations Report.

Table 20. Municipal Point Source Summary

Treatment Facility	Watershed	Permit No. (Expires)	Receiving Water	Class	7Q10 (cfs)	Design Flow (MGD)	Treatment Required	RECOMMENDATIONS			
								Monitor	Toxins	Facility Plan	Other
Albany	SP12	21199 (94/3/31)	Sugar River	WWSF ERW	80	0.140	SEC+			X	
Argyle	SP03	22225 (94/12/31)	E.Br. Pecatonica	WWSF	63	0.10	SEC+				
Barneveld	SP06	29131 (93/6/30)	E.Br. Pecatonica	WWSF	0.56	0.084	SEC+				X
Belleville	SP13	23361 (93/6/30)	Sugar R.	WWSF ERW	34	0.22	SEC+				
Belmont	SP08	20419 (93/6/30)	Bonner Branch	WWSF	0.78	0.114	SEC+				
Blanchardville	SP03	21105 (93/3/31)	E.Br.Pecatonica	WWSF	48	0.11	SEC+				
Bloomfield Manor	SP09	30805 (94/9/30)	Pedler Cr.	WWFF	0.29		INT				
Blue Mounds	SP05	31658 (98/3/31)	Trib to Williams	LFF	0	0.72	INT				X
Brodhead	SP11	21903 (94/9/30)	Sugar River	WWSF ERW	97	0.50	SEC+				
Brooklyn	SP13	23485 (93/3/31)	Allen Creek	LFF	0.27	0.116	INT				
Browntown	SP02	32051 (89/12/31)	Skinner Creek	WWSF	11	0.0405	SEC+				
Cobb	SP10	21407 (88/9/30)	Groundwater	NA		0.07	LD				
Darlington	SP08	21016 (93/3/31)	Pecatonica R.	WWSF	37	0.434	SEC+				
Dodgeville	SP06	26913 (97/9/30)	Dodge Branch	LFF	<0.01	0.51	INT			X	
Evansville	SP13	23957 (94/3/31)	Groundwater	NA		1.50	LD			X	

Treatment Facility	Water Shed	Permit No. (Expires)	Receiving Water	Class	7Q10 (cfs)	Design Flow (MGD)	Treatment Required	RECOMMENDATIONS			
								Monitor	Toxins	Facility Plan	Other
Gratiot	SP07	24139 (94/3/31)	Wolf Creek	WWSF	3.5	0.05	SEC+				
Hollandale	SP06	31330 (93/6/30)	Dodge Branch	WWSF	12	0.03	SEC+				
Juda San. Dist.	SP11	30368 (94/6/30)	N.Fk.Juda Br. Groundwater	LFF NA	?	0.0402 "	INT LD				
Iowa-Grant School Dist.	SP10	30538 (94/9/30)	Livingston Br.	WWSF	0.49	0.016	SEC+				
Linden	SP09	21580 (93/12/31)	Trib to Sudan Br.	WWSF	0.17	0.06	WLA				
Mineral Point	SP09	24791 (92/12/31)	Brewery Creek	LAL	0.72	0.278	MARG			X	
Monroe	SP01	20362 (97/6/30)	Honey Creek	WWSF	1.6	3.7	WLA				
Monticello	SP14	24830 (94/3/31)	W.Br.L.Sugar R.	WWSF	6.6	0.184	SEC+				
Mount Horeb	SP16	220281 (88/3/31)	W.Br.Sugar R.	LFF	0	0.60	INT				
New Glarus	SP14	20061 (93/3/31)	Little Sugar R.	WWSF	3.7	0.354	SEC+				
Orfordville	SP11	21709 (92/9/30)	Ditch to Swan C.	LFF	0	0.398	INT				
Rewey	SP10	31569 (89/9/30)	Williams-Rewey	LAL	0	0.025	MARG				
Ridgeway	SP06	31348 (90/9/30)	Smith-Conley	LFF	0	0.068	INT				
South Wayne	SP07	22292 (94/6/30)	Pecatonica R.	WWSF	?	0.0525	SEC+				

Municipal Point Source Summary, Continued

Treatment Facility	Water Shed	Permit No. (Expires)	Receiving Water	Class	7Q10 (cfs)	Design Flow (MGD)	Treatment Required	RECOMMENDATIONS			
								Monitor	Toxins	Facility Plan	Other
Verona	SP15	22454 (93/3/31)	Sugar River	COLD ERW	7.8	0.625	SEC+				X
Yellowstone Lake State Park	SP04	31879 (89/9/30)	trib to Yellowstone L.	LAL							

MUNICIPAL NARRATIVES

ALBANY

The village of Albany runs an aerated stabilization pond fill and draw system, which discharges to the Sugar River. The Sugar River is classified as an exceptional resource water stream at Albany. The facility has experienced operations problems that resulted in excessive total suspended solids discharges. The village has taken steps to remedy the problem (WDNR, 1992-93 [26]). If the total suspended solids problem or other problems occur, the village may have to investigate upgrading its wastewater treatment system.

Recommendations

1. The village of Albany should undertake an operations and needs review of its facility to determine if it is adequate or if the village needs to go through facilities planning to upgrade the wastewater treatment system (Type C).

ARGYLE

Argyle recently constructed a new activated sludge wastewater treatment facility that discharges to the East Branch of the Pecatonica River. The new facility is well run and produces high quality treated effluent (WDNR, 1992-93 [26]).

BARNEVELD

Barneveld operates an aerated lagoon that discharges to the East Branch of the Pecatonica River. The facility exceeded its biochemical oxygen demand (BOD) discharge limits in 1992. The village took steps to solve this problem and they seem to be working (WDNR, 1992-93 [26]). Recently, the village of Blue Mounds began preliminary evaluation of its future wastewater treatment needs. One of the options is regionalization with the village of Barneveld.

Recommendation

2. Barneveld should enter into facilities planing to upgrade its wastewater treatment plant if it exceeds its limits for biochemical oxygen demand (BOD) again (Type C).

BLANCHARDVILLE

The village of Blanchardville operates a new oxidation ditch wastewater treatment system. It replaced an old activated sludge facility that was overloading and not functioning well. The new plant is well operated and is expected to consistently meet or fall under its WPDES permit effluent limits (WDNR, 1992-93 [26]).

BLOOMFIELD MANOR

Bloomfield Manor is Iowa County's public health center and nursing home. It discharges its treated effluent to Pedler Creek. Pedler Creek was recently reclassified

from supporting a limited forage fishery to supporting a diverse warm water forage fishery (Schlesser, 1989). The facility had an old trickling filter system with operational problems and was not consistently meeting its WPDES permit limits. Bloomfield Manor is building a new activated sludge plant that is expected to meet or fall under its WPDES permit limits (WDNR, 1992-93[26]).

BLUE MOUNDS

The village of Blue Mounds operates rotating biological contact media wastewater treatment facility. It discharges its treated effluent to an unnamed tributary to Williams Creek. This plant has experienced some operational problems both with plant equipment and with bypasses due to clogged sewers. Blue Mounds State Park recently connected to the wastewater treatment system (WDNR, 1992-93 [26]). A new residential development proposed for Blue Mounds has the potential to double the population in 10 years. This will outstrip the existing plant capacity. Recently, the village of Blue Mounds began preliminary evaluation of its future wastewater treatment needs. One of the options is regionalization with the Village of Barneveld.

Recommendation

3. The village of Blue Mounds should review its operation and capacity and take necessary steps to address the potential population increase by the time of its next WPDES permit issuance (Type C).

BRODHEAD

Brodhead operates a rotating biological contact disk wastewater treatment facility. It discharges its treated effluent to the tailwater channel of the Sugar River below the dam. In 1992, it experienced periods where the facility did not meet its permitted effluent limits for biochemical oxygen demand (BOD). The DNR is requiring Brodhead to conduct and operation and needs review to evaluate flows and loadings to the plant, the plant's ability to treat those flows and loads, and what measures will be implemented (WDNR , 1993[26]).

DARLINGTON

Darlington operates a rotating biological disk wastewater treatment facility. The facility is undersized for the load it receives. Sampling errors led to erroneous estimations of plant load capabilities, but these errors have been corrected. Darlington is in facilities planning and will likely build a new oxidation ditch facility above the Pecatonica River floodplain.

DODGEVILLE

Dodgeville is a growing community that operates a rotating biological disk wastewater treatment facility that discharges to Dodge Branch. The facility has been experiencing bypassing problems and inflow and infiltration problems.

Recommendation

4. Dodgeville should undertake facilities planning to address future increased organic and hydraulic loading by the time of its next WPDES permit reissuance (Type B).

EVANSVILLE

Evansville operates an aerated lagoon with land disposal system. A 1992 Compliance Maintenance Annual Review (CMAR) score for the facility indicated a problem with effluent discharge to groundwater occasionally exceeding groundwater standards. Evansville is looking into methods of correcting this problem.

Recommendation

5. Evansville should undertake facilities planning to address where it exceeded state groundwater standards if it continues to be a problem (Type B).

GRATIOT

Gratiot operates an older activated sludge plant that discharges treated effluent to Wolf Creek. The facility has had a number of operational problems, which resulted in significant permit effluent limit violations. Gratiot and a consultant are working to maximize plant performance to bring it back into compliance. The facility is also preparing a facilities plan to address to long-term wastewater treatment in the community.

MINERAL POINT

Mineral Point discharges to Brewery Creek, which is currently classified as supporting limited aquatic life due to drainage from mine waste (roaster) piles. A project to consolidate and cover the roaster pile mine waste has been completed, resulting in improved water quality in Brewery Creek. If Brewery Creek's classification is upgraded, it would mean more stringent WPDES permit effluent limits for the wastewater treatment facility.

Recommendation

6. Mineral Point should begin facilities planning for upgrading its wastewater treatment plant in anticipation of Brewery Creek being reclassified as supporting at least a diverse forage fishery (Type B).

MONROE

Monroe operates and activated sludge wastewater treatment facility that discharges to Honey Creek. The facility has had winter operation problems resulting in permit effluent limit violations for suspended solids, biochemical oxygen demand (BOD) and ammonia. Monroe is working to solve the problem.

MONTICELLO

Monticello is constructing a new $3.5-million facility that discharges to the West Branch of the Sugar River. The new facility replaces an older facility which was in non-compliance with its WPDES permit.

NEW GLARUS

New Glarus has recently completed a new wastewater treatment plant that discharges to the Little Sugar River. This new plant replaces and older facility which was not meeting its WPDES permit limits. The new facility is meeting even more stringent WPDES permit effluent limits.

VERONA

Verona operates an activated sludge wastewater treatment plant that discharges to the Sugar River. Verona is growing and is in facilities planning to address anticipated growth. Due to the reclassification of the Sugar River to supporting a cold water community and requiring protection as an exceptional resource water, it is more cost-effective for Verona to send its wastewater to Madison Metropolitan Sewerage District's (MMSD) Nine Springs treatment facility for treatment. The other two options evaluated were Verona operating a one million gallon per day plant discharging to the Sugar River, and MMSD building and operating a regional treatment facility at Verona, which would discharge about 3.5 million gallons per day of treated effluent to the Sugar River at Verona. The community did not evaluate a land disposal system discharging to groundwater.

A number of issues remain regarding the proposed connection to MMSD. It is estimated that the Sugar River basin is losing perhaps as much as three million gallons per day, or 4.7 cubic feet per second of base flow. These waters are being added as treated wastewater discharged into the Yahara River Watershed in the Lower Rock River basin due to groundwater pumpage by the city of Madison (DCRPC, 1993). It is estimated that pumping Verona's effluent to MMSD will result in a total decline in the Sugar River $Q_{7,10}$ flow of an additional two to four cubic feet per second by 2010. The increased regional groundwater pumpage will result in the $Q_{7,10}$ flow of Badger Mill Creek near Verona being reduced to zero cubic feet per second (DCRPC, 1993). This groundwater diversion has to be weighed against the impacts on water quality, the existing cold water fish community and exceptional resource waters of the Sugar River that would be caused by the discharge of in excess of three million gallons per day of treated effluent into the Sugar River. DNR field staff believe the discharge of large volumes of treated effluent has the potential of doing as much harm to water quality and in-stream habitat than the potential decline in base flow.

Long-term, cumulative impacts of urbanization on water quality and in-stream habitat of the upper reaches of the Sugar River are a major concern of DNR staff. The tools and responsibility for addressing these long-term impacts on the Sugar River rests with Dane County and the municipalities in the watershed. The Dane County Regional Planning Commission, with MMSD, the Wisconsin Geologic and Natural History Survey, and the U.S. Geologic Survey are undertaking a regional groundwater hydrology study that should address the base flow issues resulting from continued groundwater withdrawal

and diversion from the Sugar River basin. The regional groundwater study will not be completed until the end of 1995.

The Verona Sewer Service Area was annexed to the Madison Metropolitan Sewerage District in the fall of 1993. It is expected that wastewater from Verona will be treated by MMSD's Nine Springs plant beginning in late 1994 or early 1995. MMSD is proposing to return treated effluent to the Sugar River basin via a pipe with a discharge to Badger Mill Creek. The primary purpose of this proposal is to return water withdrawn from the basin by municipal wells. This could help maintain base flow in Badger Mill Creek and protect the Sugar River downstream of Badger Mill from the adverse water quality effects of continued groundwater withdrawal and diversion. MMSD is currently conducting a study looking at various issues associated with any proposed discharge to Badger Mill Creek. The study will address thermal issues, possible changes in stream morphology and hydrology, and effects of any discharge on fisheries and aquatic macroinvertebrates in Badger Mill and the Sugar River. The study, with recommendations is expected to be done in late summer of 1995.

MMSD had expressed concern whether in 20 years a wastewater discharge return to the Sugar River might be allowed under the existing state antidegradation rules. DNR recognizes that changing regional environmental conditions may make it desirable to have a wastewater discharge to the Sugar River; it cannot say at this time whether or not a discharge to the Sugar River at Verona will allowed or what permit conditions might be imposed 20 years in the future.

Recommendation

7. DNR and Dane County should address and implement any recommendations coming out of the regional groundwater hydrology study for the Sugar River Basin (Type C).

INDUSTRIAL POINT SOURCE DISCHARGER NARRATIVES

Basic information on each industrial WPDES permittee in the Sugar-Pecatonica River basin is provided in Table 21. This information includes facility name, permit number, permit expiration date, planning area, receiving water, water quality classification of the receiving water and watershed number. Please see the municipal section for definitions of information listed in the table.

Table 21. Summary of Industrial Point Source Dischargers

Facility	County	Permit No. (Expires)	Design Flow (MGD)	Planning Area	Receiving Water	Class	Watershed	Recommendations Narrative	Toxins	Other
Advance Transformer	Green	38580 (86/3/31)		Monroe	Honey Creek	WWSF	SP			
Agri Services Exeter Pork	Green	56251 (90/6/30)			Groundwater	--	SP			
Apple Grove Cheese Coop	Green	50806 (91/12/31)			Groundwater	--	SP			
Avonmore Cheese and Butter	Green	70971 (95/3/31)		Monroe	Honey Creek	WWSF	Sp			
Avonmore Whey	Green	55735 (89/3/31)		Monroe	Groundwater	--	SP			
Besnier America	Lafayette	54470 ((92/12/31)		Belmont	Groundwater	--	SP			
Black Farm	Green	56502 (93/12/31)			Groundwater	--	SP			
Browntown Whey	Green	23728 (94/6/30)		Browntown	Skinner Cr.	WWSF	SP			
Brunkow Cheese	Lafayette	70394 (90/9/30)		Darlington	Otter Cr. Groundwater	WWSF	SP			
Chalet Cheese Coop	Green	70661 (90/9/30)			Groundwater	--	SP			
Chula Vista	Lafayette Cheese	53244 (91/3/31)			Groundwater	--	SP			
Davis Cheese	Green Coop	54216 (92/3/31)			Groundwater	--	SP			
Deppeler Cheese	Green Factory	54534 (92/3/31)			Groundwater	--	SP			
Decatur Cheese	Green Coop	53902 (92/12/31)			Groundwater	--	SP			
EDC Inc., Wis. Biogas	Green	57088 (90/9/30)		Monroe	Groundwater	--	SP			
Franklin Cheese	Green Coop	52345 (92/6/30)			Groundwater	--	SP			
Fritsch Cheese	Iowa Factory	50652 (91/6/30)			Groundwater	--	SP			
Gold Brick Cheese Co.	Lafayette	55298 (91/12/30)		Gratiot	Groundwater	--	SP			

Facility	County	Permit No. (Expires)	Design Flow (MGD)	Planning Area	Receiving Water	Class	Watershed	Recommendations		
								Narrative	Toxins	Other
Green-Rock FS Coop	Green	48127 ?		Brodhead	Sugar River	WWSF	SP			
Hicks Cheese	Lafayette	54429 (91/6/30)			Groundwater	--	SP			
Hidden Valley Farms	Lafayette	57479 (94/12/31)			Groundwater	--	sp			
Jefferson Center Dairy	Green	70602 (95/12/31)			Groundwater	--	SP			
Maple Leaf Cheese Coop	Green	55361 (93/3/31)		Albany	Groundwater	--	SP			
Mid-America	Green	54593 (91/3/31)		Juda	Groundwater	--	SP			
Silver Lewis Cheese Coop	Green	50385 (91/12/30)			Groundwater	--	SP			
Spring Creek Cheese Coop	Green	53724 (91/6/30)		Brodhead	Groundwater	--	SP			
Swiss Heritage Cheese, Inc	Green	57754 ?		Monticello	Groundwater	--	SP			
Swiss Valley Coop	Green	55409 (95/3/31)			Groundwater	--	SP			
Sylvester Whey	Green	46957 (93/6/30)			N.Br. Juda Cr.	LFF	SP			

REFERENCES

1. Department of Natural Resources, Water Resources Management Files - Southern District, 1992-93.

2. Department of Natural Resources, Fisheries Management Files - Southern District, 1992-93.

3. Department of Natural Resources, *Wisconsin Trout Streams*, 1980.

4. Marshall, Dave. "Sugar River Basin Non-Point Source Assessment", unpublished report, Department of Natural Resources, 1988.

5. Day, Elizabeth A. et.al. *Surface Water Resources of Dane County*, Department of Natural Resources, 1985.

6. Dane County Regional Planning Commission (DCRPC). *Dane County Water Quality Plan: Appendix B Update Surface Water Quality Conditions*, 1992.

7. Dane County Regional Planning Commission (DCRPC). "Environmental Assessment of the City of Verona Wastewater Facilities Planning Alternatives", 1993.

8. Dane County Soil and Water Conservation District. *Upper Sugar River Watershed Plan*, 1981.

9. Barthel, Kevin. *Upper Sugar River Watershed Plan Evaluation Report*, Dane County Land Conservation Committee, 1990.

10. Marshall, Dave. Personal Communications, Department of Natural Resources, 1992-93.

11. Fix, Steven. Personal Observations, Department of Natural Resources, 1987-92.

12. Marshall, Dave. "Sugar River Millpond Issues" (unpublished report), Department of Natural Resources, 1988.

13. Van Vlack, Karin. Personal Communication, Dane County Lakes and Watershed Commission, 1992.

14. Marshall, Dave. "Reclassification of Badger Mill Creek" (unpublished report), Department of Natural Resources, 1989.

15. Fago, Don. *Distribution and Relative Abundance of Fishes in Wisconsin: Greater Rock River Basin*, Department of Natural Resources, 1982.

16. Dane County Regional Planning Commission (DCRPC). "Assessment of Dane County Watersheds for Nonpoint Source Pollution Management

Programs", 1991.

17. Marshall, Dave. "Lower East Branch Pecatonica Priority Watershed Project: Water Resources Appraisal Report" (unpublished report), Department of Natural Resources, 1991.

18. Haynes, Charlotte H. *Nonpoint Source Control Plan for the Lower East Branch Pecatonica River Priority Watershed Project*, Department of Natural Resources, 1992.

19. Coughlin, Timothy. Personal Communications, Department of Natural Resources, 1993.

20. Bush, Donald M., et.al. *Surface Water Resources of Green County*, Department of Natural Resources, 1980.

21. Schlesser, Roger. "Brewery Creek at Mineral Point, Iowa County", Department of Natural Resources, 1990.

22. Schlesser, Roger. Personal Communications, Department of Natural Resources, 1993.

23. Schlesser, Roger. "Brewery Creek at Mineral Point: Triennial Standards Review, Mineral Point WWTP", Department of Natural Resources, 1988.

24. Schlesser, Roger. "Pedler Creek at Bloomfield Manor: Triennial Standards Review, Bloomfield Manor WWTP", Department of Natural Resources, 1989.

25. Water Resources Management (WRM), Bureau of. *Upper West Branch Pecatonica River Priority Watershed Plan*, Department of Natural Resources, 1982.

26. Department of Natural Resources, Southern District Wastewater Management File, 1992-93.

27. Marshall, Dave and Scot Stewart. "Sugar River Classification Study", Department of Natural Resources, 1993.

28. Eagan, Lloyd L. *Sugar-Pecatonica River Basin Areawide Water Quality Management Plan*, Department of Natural Resources, 1988.

29. Schlesser, Roger. "East Branch of the Pecatonica River at Barneveld: Triennial Standards Review, Barneveld WWTP", Department of Natural Resources, 1988.

30. Mason, John W., et.al. "Nutrient Loss Via Groundwater Discharge From Small Watersheds In Southwestern and South Central Wisconsin", in *Journal of Soil and Water Conservation*, pp.327-331, March-April 1990.

31. Department of Natural Resources, Southern District Water Regulation and Zoning Files , 1993.

32. Kroner, Ron et. al. "Upper West Branch Pecatonica River Priority Watershed Project: Bioassessment Final Report", WDNR, 1992.

33. Marshall, Dave and Mike Vollrath. "Monitoring Impacts of Spills on Surface Water Quality" (unpublished report), Department of Natural Resources, 1993.

34. Schlesser, Roger. "Dodge Branch at Dodgeville: Triennial Standards Review, Dodgeville WWTP", Department of Natural Resources, 1988.

35. Schlesser, Roger. "Smith-Conley Creek at Ridgeway: Triennial Standards Review, Ridgeway WWTP", 1988.

36. Marshall, Dave. "Report on the Reclassification of West Branch Sugar River Headwaters and the performance of the Mt. Horeb Wastewater Treatment Facility", Department of Natural Resources, 1988.

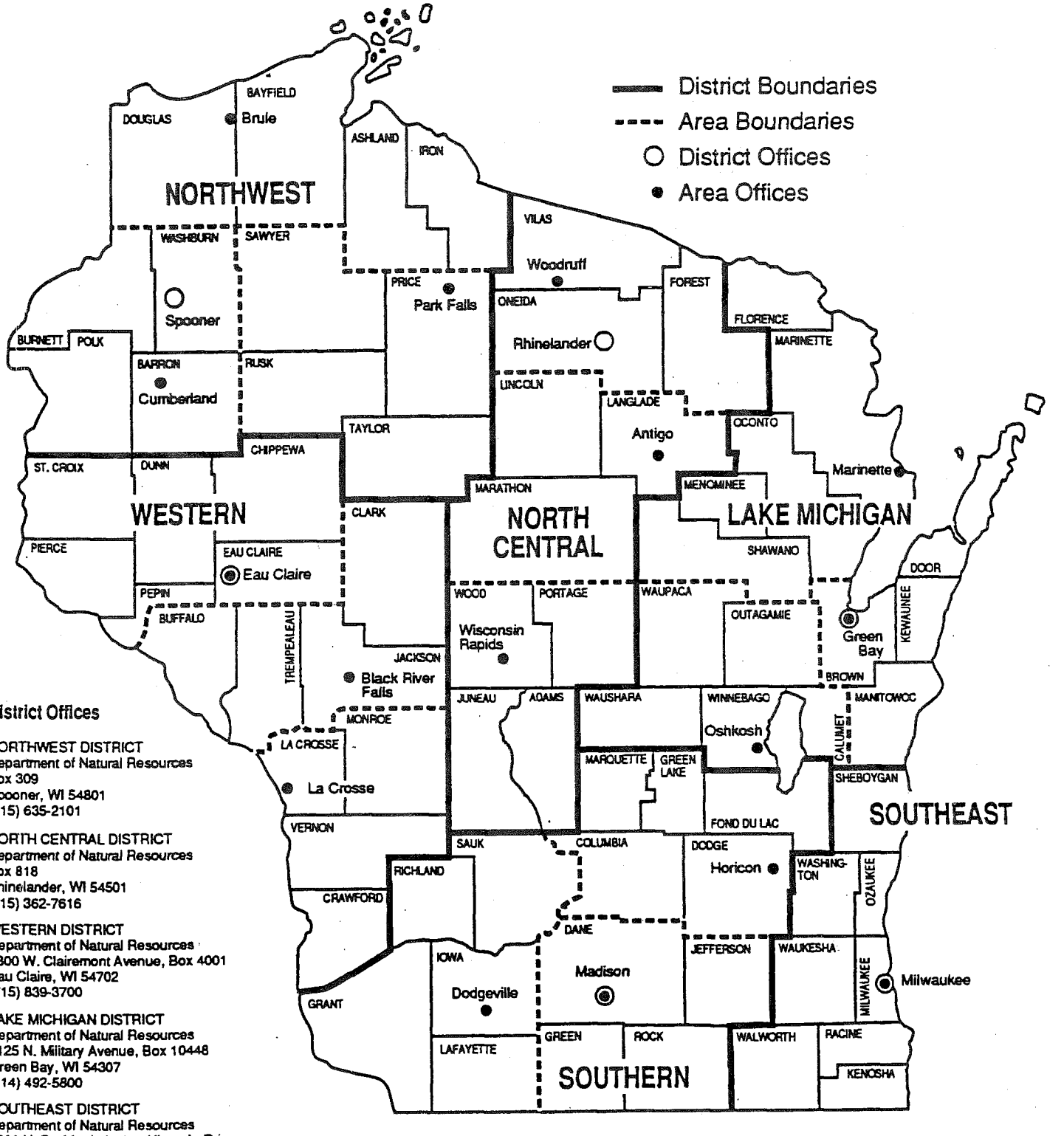
37. Howard, Tom. Personal Communication, Department of Natural Resources, 1994.

38. Leverance, James. Personal Communication, Department of Natural Resources, 1994.

39. Wells, C. Topf. Personal Communication, Department of Natural Resources, 1994.

40. Van Dyck, Eugene. Personal Communication, Department of Natural Resources, 1994.

DNR Field Districts and Areas



District Offices

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

NORTH CENTRAL DISTRICT
Department of Natural Resources
Box 818
Rhinelander, WI 54501
(715) 362-7616

WESTERN DISTRICT
Department of Natural Resources
1300 W. Clairemont Avenue, Box 4001
Eau Claire, WI 54702
(715) 839-3700

LAKE MICHIGAN DISTRICT
Department of Natural Resources
1125 N. Military Avenue, Box 10448
Green Bay, WI 54307
(414) 492-5800

SOUTHEAST DISTRICT
Department of Natural Resources
2300 N. Dr. Martin Luther King, Jr. Drive
Box 12436
Milwaukee, WI 53212
(414) 263-8500

SOUTHERN DISTRICT
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
(608) 275-3266

REV 8/91

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