Nonpoint Source Control Plan for the Upper Trempealeau River Priority Watershed Project

This plan was prepared under the provisions of the Wisconsin Nonpoint Source Pollution Abatement Program by the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Protection in cooperation with the Jackson and Trempealeau County Land Conservation Departments

Watershed Plan Organization Information

Natural Resources Board
1995

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Nonpoint Source Control Plan for the Upper Trempealeau River Priority Watershed Project

The Wisconsin Nonpoint Source Water Pollution Abatement Program

Plan Approved
July, 1994

This Plan Was Cooperatively Prepared By:

The Wisconsin Department of Natural Resources
Wisconsin Department of Agriculture, Trade and Consumer Protection
and
The Jackson and Trempealeau County Land Conservation Departments

Publication WR-419-95

For copies of this document please contact:

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

Watershed Plan Credits

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October 6, 1994

David Mahlum, Chair
Trempealeau County Land Conservation Committee
Courthouse
Whitehall, WI 54773

Dear Mr. Mahlum:

I am pleased to approve the Upper Trempealeau River Priority Watershed Plan prepared through the Wisconsin Nonpoint Source Water Pollution Abatement Program. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR 120, Wisconsin Administrative Code. This plan has also been approved by the Land and Water Conservation Board. I am also approving this plan as an amendment to the Trempealeau River Areawide Water Quality Management Plan.

I would like to express the Department's appreciation to the Trempealeau County staff that participated in preparing this plan, particularly Daun Rudis and Dave Appleyard. We look forward to assisting Trempealeau County in the implementation of the Upper Trempealeau River Priority Watershed Plan.

Sincerely,

George

George E. Meyer
Secretary

cc: Dave Appleyard - Trempealeau County LCD
Dan Simonson - WD
Lynne Hess - DATCP
Chuck Ledin - WR/2
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October 6, 1994

Steven Dickinsen, Chair
Jackson County Land Conservation Committee
307 Main Street, Courthouse
Black River Falls, WI 54615

Dear ~~Mr.~~ Steve Dickinsen:

I am pleased to approve the Upper Trempealeau River Priority Watershed Plan prepared through the Wisconsin Nonpoint Source Water Pollution Abatement Program. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR 120, Wisconsin Administrative Code. This plan has also been approved by the Land and Water Conservation Board. I am also approving this plan as an amendment to the Jackson River Areawide Water Quality Management Plan.

I would like to express the Department's appreciation to the Jackson County staff that participated in preparing this plan, particularly Steve Stark and Gaylord Olson. We look forward to assisting Jackson County in the implementation of the Upper Trempealeau River Priority Watershed Plan.

Sincerely,

George

George E. Meyer
Secretary

Good luck on this excellent project!

cc: Gaylord Olson - Jackson County LCD
Dan Simonson - WD
Lynne Hess - DATCP
Chuck Ledin - WR/2
Cindy Hoffland - CA/8
→ Karen Rahmeier - WR/2

Resolution

Approval of the Upper Trempealeau River
Priority Watershed Project Plan

Supervisors:

Whereas, the 112,338 acre Upper Trempealeau River (UTR) Watershed is located in western Jackson County and eastern Trempealeau County, and

Whereas, in November, 1991 the Trempealeau and Jackson County Boards accepted duties and responsibilities to start the planning process for the Upper Trempealeau River Watershed, and

Whereas, the Non-Point Source Control Plan has been written and reviewed by the Land Conservation Department staff from Trempealeau and Jackson counties, and

Whereas, by approving the Plan many county landowners within the Upper Trempealeau River Watershed area will become eligible to voluntarily sign agreements to install soil and water conservation practices over the next eight years.

NOW THEREFORE BE IT RESOLVED, that the Trempealeau County Board of Supervisors accept the Non-Point Source Control Plan for the Upper Trempealeau River Priority Watershed Project.

Dated at Whitehall, Wisconsin, September 19, 1994.

Respectfully submitted,

Trempealeau County Land Conservation Committee

David Mahlum

Roland Thomas

Harold Tomter

Geraldine Van Tassel

Adolph Gierok

Gene Marsolek

STATE OF WISCONSIN)
)SS
TREMPEALEAU COUNTY)

I, Paul L. Syverson, Trempealeau County Clerk, hereby certify that the attached resolution is a true and correct copy of the resolution (approved/~~rejected~~) by the Trempealeau County Board of Supervisors on the 19 day of September, 1994.

Paul L. Syverson
Trempealeau County Clerk

RESOLUTION NO. 60-9-94

TO: Jackson County Board of Supervisors

FROM: Jackson County Land Conservation Committee

REGARDING: Approval of the Upper Trempealeau River Priority Watershed Project Plan

WHEREAS, the 112,338 acre Upper Trempealeau River (UTR) Watershed is located in western Jackson County and eastern Trempealeau County,

WHEREAS, in November, 1991 the Jackson and Trempealeau County Boards accepted duties and responsibilities to start the planning process for the Upper Trempealeau River Watershed,

WHEREAS, the Non-Point Source Control Plan has been written and reviewed by the Land Conservation Department staff from Jackson and Trempealeau counties,

WHEREAS, by approving the Plan many county landowners within the Upper Trempealeau River Watershed area will become eligible to voluntarily sign agreements to install soil and water conservation practices over the next eight years,

NOW THEREFORE BE IT RESOLVED, that the Jackson County Board of Supervisors accept the Non-Point Source Plan for the Upper Trempealeau River Priority Watershed Project.

RESOLUTION OFFERED BY THE
LAND CONSERVATION COMMITTEE

Steve Dickinsen

Tom Peasley

Neil Humphrey

Roger Hansen

Wallace Pfaff

Merle Prindle

LCDreslutn

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SUMMARY

Introduction

The Upper Trempealeau River Priority Watershed Project plan assesses the nonpoint sources of pollution in the Upper Trempealeau River Watershed and guides the implementation of nonpoint source control measures. These control measures are needed to meet specific water resource objectives for the Upper Trempealeau River and its tributaries. The primary objective of the project is to reduce nonpoint source pollution to the Trempealeau River, and to enhance and protect the water quality of streams in the Upper Trempealeau River Watershed.

Nonpoint sources of pollution most commonly found in this watershed include: polluted runoff from barnyards and feedlots; sediment from cropland erosion; and runoff from winterspread manure. The purpose of this project is to reduce the amount of pollutants originating from nonpoint sources that reach surface water and groundwater within the Upper Trempealeau River Priority Watershed Project area.

This plan was prepared by the Department of Natural Resources (DNR), the Department of Agriculture, Trade and Consumer Protection (DATCP), and the Jackson and Trempealeau County Land Conservation Departments. The DNR selected the Upper Trempealeau River Watershed as a priority watershed project through the Wisconsin Nonpoint Source Water Pollution Abatement Program in 1991. It joined approximately 50 similar watershed projects statewide in which nonpoint source control measures are being planned and implemented. The Nonpoint Source Water Pollution Abatement Program was created in 1978 by the Wisconsin State Legislature. The program provides financial and technical assistance to landowners and local governments to reduce nonpoint source pollution.

The project is administered at the state level by the DNR and DATCP. The Jackson and Trempealeau County Land Conservation Departments will administer the project at the local level with assistance from the University of Wisconsin-Extension and the Natural Resources Conservation Service (U.S. Department of Agriculture).

General Watershed Characteristics

The Upper Trempealeau River Watershed drains 112,338 acres of land in Jackson and Trempealeau Counties in West Central, Wisconsin. The watershed is part of the Buffalo and Trempealeau Sub Basin. The Upper Trempealeau River drains to Lake Henry. The Upper

Trempealeau River Watershed was divided into 16 smaller drainage areas, called subwatersheds, for this planning effort (map 2-1).

Land use in the watershed (as shown in table S-1) is mainly Agricultural, and is currently dominated by cropland. The watershed population is small—approximately 3,030 people. Most of the watershed population lives outside incorporated areas, in small enclaves of residential development or on farmsteads.

Table S-1. Land Use in the Upper Trempealeau River Watershed

Land Use	Percent of Watershed
Agricultural	
pasture	4
cropland	49
Conservation Reserve Program (CRP)	3
Woodlots	34
Developed	3
Mined	1
Wildlife Habitat	6

Source: DNR, Jackson and Trempealeau County LCD

Water Quality

The Upper Trempealeau River Watershed rivers and streams support a cold water sport fishery. The streams of the watershed are not reaching their highest potential use due to pollution from point and nonpoint sources. Eroding croplands and streambanks and improperly managed livestock operations are the major source of nonpoint pollution in the watershed.

Existing Uses

Most of the perennial tributaries to the Trempealeau River in this watershed have coldwater fish communities and support a trout fishery. The Upper Trempealeau River Watershed has 6 Class I, 5 Class II and 4 Class III trout streams and several warmwater forage fishery streams. The Trempealeau River above Lake Henry is primarily used for fishing and supports a limited coldwater sport fishery. Fish surveys conducted on 20 streams in the

watershed in 1991-92 found brook and brown trout and 16 minnow and forage fish species. White sucker, common creek chub, blacknose dace, brook stickleback and Johnny darter were the most common forage species. The details of these assessments are discussed later in this watershed plan.

Problems and Pollutants

An inventory of groundwater quality was done in conjunction with the animal lot inventories. Results show that of the well samples collected in Jackson County, 27.3 percent had nitrate levels over the enforcement standard (health advisory level) of 10 milligrams per liter (mg/l), and 37.2 percent had nitrate levels between 2 mg/l, the preventative action limit, and 10 mg/l. These nitrate levels are significant.

Well sampling for triazine in Jackson County showed that .8 percent of the samples collected had triazine levels over 3.0 mg/l, which is the enforcement standard for triazine. Triazine is a man-made compound which when present in groundwater indicates groundwater contamination. Fifty-one percent of the samples collected had triazine levels between 0.3 and 3.0 mg/l. The preventative action limit for triazine is 0.3 mg/l.

Sources of Water Pollution

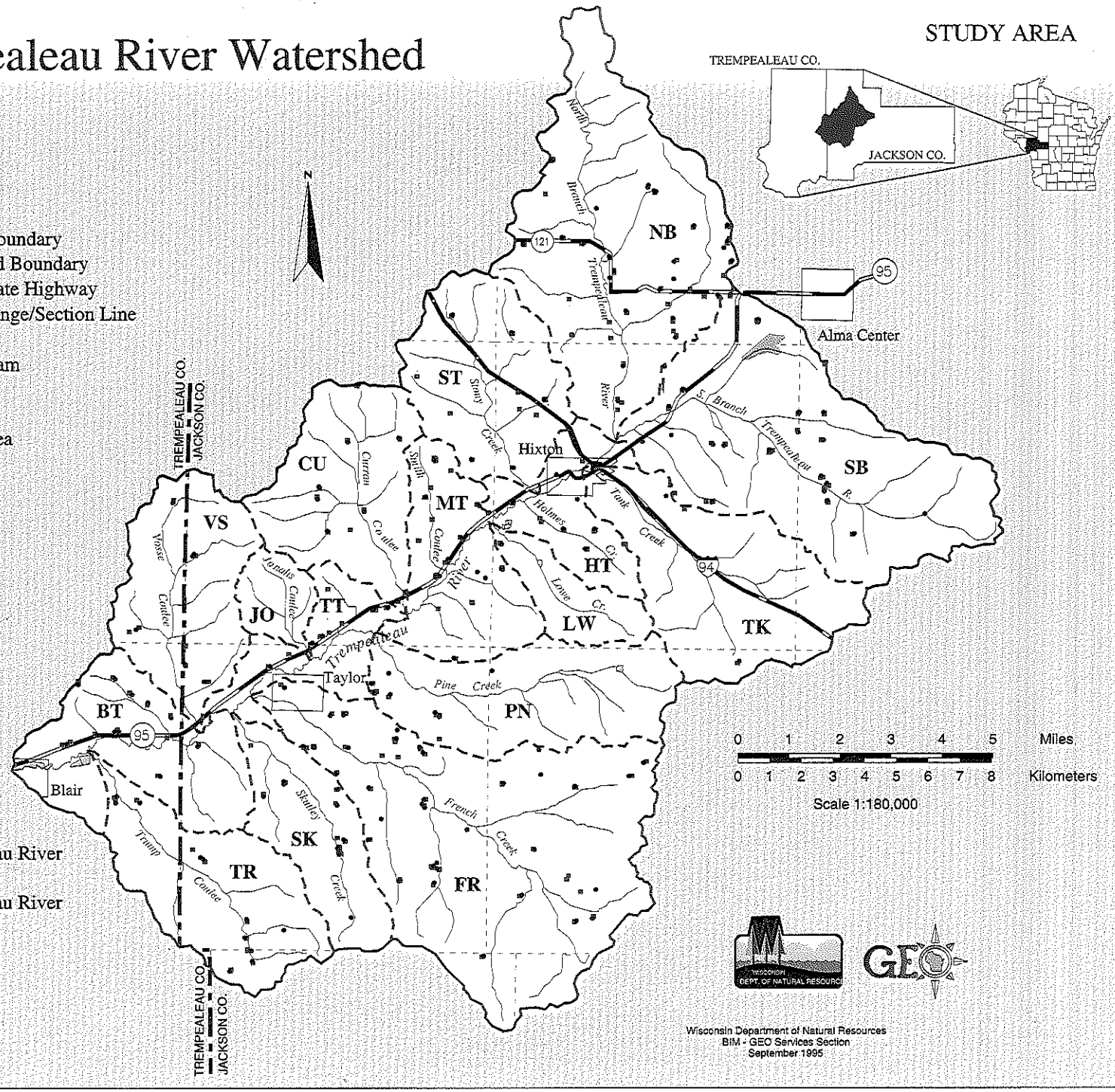
The Jackson and Trempealeau County Land Conservation Departments collected data on all agricultural lands, barnyards, manure storage sites, and streambanks in the watershed. These data were used to estimate the pollutant potentials of these nonpoint sources. The amount of phosphorus carried in runoff from each barnyard to a receiving stream was calculated. The amount of sediment reaching streams from eroding agricultural lands and streambanks was also determined. In the Upper Trempealeau River Watershed, about 70 percent of the sediment deposited in streams annually is derived from agricultural upland erosion. Twenty-four percent of the sediment reaching streams originates from streambank erosion. Approximately six percent of the sediment reaching streams comes from gullies.

The results of the investigations of nonpoint sources are summarized below:

1. Barnyard Runoff Inventory Results:

    - 256 barnyards were assessed.
    - These barnyards were found to contribute 7,508 pounds of phosphorus to surface waters, annually.

Map S- 1.
Upper Trempealeau River Watershed



SUBWATERSHEDS

BT = Blair - Trempealeau
CU = Curran Coulee Creek
FR = French Creek
HT = Holmes - Trempealeau
JO = Jonahs Coulee Creek
LW = Lowe Creek
MT = Main - Trempealeau
NB = North Branch Trempealeau River
PN = Pine Creek
SB = South Branch Trempealeau River
SK = Skutley Coulee Creek
ST = Stony Creek
TK = Tank Creek
TR = Trump Coulee Creek
TT = Taylor - Trempealeau
VS = Vosse Coulee Creek

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

2. Streambank Erosion Inventory Results:

- 114 stream miles were inventoried
- 2,057 tons of sediment reach streams from eroding sites (24 percent of total sediment)
- There are 11 miles of eroding sites (5 percent of streambanks inventoried).

3. Upland Sediment Inventory Results:

- 22,468 acres were inventoried.
- 6,242 tons of sediment are delivered to streams: (70 percent of total sediment).

4. Wetland Inventory Results:

No formal wetland inventory was conducted because less than 2% of the watershed is wetlands. However, wetlands are eligible for restoration.

Pollutant Reduction Goals

To improve water quality in the Upper Trempealeau River and its tributaries, this plan calls for:

1. A 39 percent reduction in the sediment reaching streams from agricultural uplands in all subwatersheds.

2. A 40 percent reduction in streambank sediment delivered to all streams and a 40 percent overall repair of streambank habitat in all subwatersheds.

3. A 69 percent reduction in organic pollutants from barnyards in all subwatersheds.

4. A reduction in organic pollutants from winterspread manure on unsuitable acres in all subwatersheds.

Management Actions

Management actions are described in terms of best management practices (BMPs) that are needed to control nonpoint sources to the pollutant levels described above. Cost-share funds for installing pollutant control measures will be targeted at operations which contribute the greatest amounts of pollutants. Cost-share funds will be available through the Wisconsin Nonpoint Source Water Pollution Abatement Program for certain BMPs. As shown in table S-2, cost-share rates range from 50 to 70 percent.

The Jackson and Trempealeau County Land Conservation Departments will contact all landowners who are eligible to receive cost-share funds during the project's implementation. All Category I sources of nonpoint pollutants must be controlled if a landowner wishes to participate in any aspect of the program. Category I represents the level of pollution control needed to achieve water quality goals in the watershed. Nonpoint sources in Category II contribute less of the pollutant load than those in Category I. They are included in cost sharing eligibility to further insure that water quality goals are met. Controlling sources in this category is not mandatory for a landowner to be funded for controlling other sources.

The Jackson and Trempealeau County Land Conservation Departments will assist landowners in applying BMPs. Practices range from alterations in farm management (such as changes in manure-spreading and crop rotations) to engineered structures (such as diversions, sediment basins, and manure storage facilities), and are tailored to specific landowner situations. Participation in the program is voluntary.

The following is a brief description of essential nonpoint pollutant sources, project eligibility criteria, and BMP design targets for the project.

1. Agricultural Lands

   All agricultural lands eroding at a rate greater than "T" tons per acre per year will be classified as Category I for cost sharing and must be brought down to a rate of "T" tons per acre per year. This involves an estimated 38 percent of the upland sediment in the watershed. Category II will include all lands contributing sediment to streams at a rate between 0.2 and eroding at rates less than "T" tons per acre per year. This involves two percent of the upland sediment in the watershed.

   The BMPs identified by the Jackson and Trempealeau County Land Conservation Departments emphasize both improving farm management and controlling pollutants. Table S-2 shows the eligible practices and cost-share rates.

2. Animal Lots

   The manure from barnyards that is carried in runoff needs to be controlled at about 78 of the 256 livestock operations. All barnyards contributing more than 100 pounds of phosphorus will be classified as Category I for cost sharing and need to be reduced to 10 pounds annually or less.

   Category II barnyards, those which contribute between 20 and 100 pounds of phosphorus annually, will be eligible for cost sharing and will need to be reduced to 10 pounds annually, or less.

Table S-2. Best Management Practices Eligible for Cost Sharing Through the Upper Trempealeau River Priority Watershed Project	
Best Management Practice	State Cost Share Rate
Field Diversions	70%
Grassed Waterways	70%
Critical Area Stabilization	70%
Shoreline Buffers	70%
Wetland Restoration	70%
Shoreline and Streambank Stabilization	70%
Grade Stabilization Structures	70%
Agricultural Sediment Basins	70%
Barnyard Runoff Management	70%
Animal Lot Relocation	70%
Manure Storage Facilities	70%
Livestock Exclusion from Woodlots	50%
Nutrient and Pesticide Management	50%
Roofs for Barnyard Runoff Management and Manure Storage Facilities	70%
Intensive Grazing Management	50%
Abandonment of Manure Storage Systems	50%
Milking Center Waste Control	70%
Cattle Mounds	70%
Spill Control Basins	70%
Contour Farming	N/A[1]
Contour Stripcropping	$12.00/acre[1]
Reduced Tillage	$45.00/acre[2]
Reduced Tillage	$15.00/acre[3]
Green Manure Crop	$25.00/acre[4]
Streambank and Woodland Fencing 3 Strand Barbed Wire Electric	 $12.00/rod $8.00/rod
Woodland Fencing 3 Strand Barbed Wire Electric	 $8.50/rod $5.50/rod
Critical Area Stabilization—Tree Planting	$125.00/acre

[1] Wildlife habitat restoration components of this practice are cost-shared at 70%.
[2] $45 per acre over 3 years for reduced tillage on continuous row croplands.
[3] $15 per acre for one year only for reduced tillage on crop rotations involving hay.
[4] $25 per acre up to 3 years for green manure crop.

3. Manure Spreading

Participants in the Upper Trempealeau River project who winterspread manure on 20 or more acres of "unsuitable" land will be targeted as Category I for control measures

(BMPs). These landowners are required to implement and adhere to a Natural Resources Conservation Service (NRCS) "590 Nutrient Management" plan. In this project "unsuitable" lands for winter manure spreading are those lands with greater than six percent slope or which are prone to flooding. Either the County LCD or crop consultant (via professional services contract with the LCD) will assist farm operators in preparing a management plan for proper manure spreading. A manure management plan identifies the proper spreading periods, application rates, and acceptable fields for manure spreading.

4. Streambanks

All landowners will be required, Category I, to control 40% of the mass sediment load from agriculturally impacted streambanks on their property.

Furthermore, any livestock grazing along streambanks must be properly managed. There will be an emphasis on controlling bank erosion and improving fish and wildlife habitat in all subwatersheds, to enhance water quality and recreational opportunities.

Funds Needed for Cost Sharing, Staffing, and Educational Activities

Grants will be awarded to Jackson and Trempealeau Counties by the DNR for cost sharing, staff support and educational activities. Table S-3 includes estimates of the financial assistance needed to implement needed nonpoint source controls in the Upper Trempealeau River Watershed, assuming a 50 percent participation rate of eligible landowners.

Table S-3. Cost Estimates for the Priority Watershed Project

Eligible Activity	Total Cost*	State Share*
Cost Sharing	$11,263,328	$7,729,590
Easements	52,500	52,500
Jackson and Trempealeau Counties Staffing	2,346,911	2,346,911
Educational Activities	31,130	31,130
Totals	$13,693,869	$10,160,131

* Estimates based on 75% participation.

Project Implementation

Project implementation is scheduled to begin in 1994. The first three years of implementation is the period for participants to sign cost-share agreements. There is a five-year period for practice installation. While an eligible landowner or operator has three years to determine whether to participate in the program, the installation of BMPs can usually begin as soon as a landowner has signed a cost-share agreement with the Jackson and Trempealeau County Land Conservation Departments.

Information and Education

An information and education program will be conducted throughout the project period with the Jackson and Trempealeau County Land Conservation Departments having overall responsibility for the program. University of Wisconsin–Extension staff in the county will provide assistance. This program will be most intensive during the first three years of the project as landowners and local governments sign up for state cost sharing for pollution control. The program includes:

- A media campaign to inform the public about nonpoint source pollution and activities the public can do to reduce this type of pollution.
- More intensive educational activities, such as meetings, workshops, tours, and demonstration projects for landowners and local government officials who must adopt new pollution control techniques.
- Water quality newsletters that will inform farmers, local government officials, community groups, and concerned citizens about watershed activities, implementation processes, and pollution control methods.
- Educational activities and service projects to inform youth about water resource issues and help them develop a conservation ethic.

Further Information

If you want more information about the Upper Trempealeau River Priority Watershed Project, or a copy of the watershed plan, contact one of the following:

Dan Simonson, Coordinator
DNR
Western District Headquarters P.O. Box 4001
Eau Claire, WI 54702-4001
Phone 715-839-3725

Steve Stark
Jackson County Land Conservation Department
Courthouse
Black River Falls, WI 54615
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Daun Rudis
Trempealeau County Land Conservation Department
Courthouse
Whitehall, WI 54773
Phone 715-538-2311

Project Evaluation and Monitoring

The evaluation strategy for the project involves the collection, analysis, and reporting of information so that progress may be tracked in three areas:

1. **Administrative**: This category includes the progress in providing technical and financial assistance to eligible landowners, and carrying out education activities identified in the plan. The Jackson and Trempealeau County LCD(s) will track the progress in this area and report to the DNR and DATCP quarterly.

2. **Pollutant Reduction Levels**: The Jackson and Trempealeau County LCD(s) will calculate the reductions in nonpoint source pollutant loadings resulting from changes in land use practices and report to the DNR and DATCP at an annual review meeting.

3. **Water Resources**: The DNR will monitor changes in water quality, habitat, and water resource characteristics during the project and at the end of the project period.

CHAPTER ONE
Introduction, Purpose and Legal Status

Wisconsin Nonpoint Source Water Pollution Abatement Program

The Wisconsin State Legislature created the Wisconsin Nonpoint Source Water Pollution Abatement Program (NPS) in 1978. The goal of the NPS Program is to improve and protect the water quality of streams, lakes, wetlands, and groundwater by reducing pollutants from urban and rural nonpoint sources. The 112,338 acre Upper Trempealeau River Watershed, located entirely in Jackson and Trempealeau Counties, was designated a "priority watershed" in 1991. The primary objective of this project is to reduce nonpoint source pollution loads to the Trempealeau River and to enhance and protect the water quality of the streams in the Upper Trempealeau River Watershed.

Nonpoint sources of pollution include eroding agricultural lands, streambanks, roadsides and developing urban areas, and runoff from livestock wastes and gullies. Pollutants from nonpoint sources are carried to the surface water or groundwater through the action of rainfall runoff, snowmelt, and seepage.

The following is an overview of the NPS Program:

- The DNR and DATCP administer the program which focuses on essential hydrologic units called priority watersheds. The program is implemented through priority watershed projects for which a plan is prepared.

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

- Technical assistance is provided to aid in the design of BMPs. State level cost-share assistance is available to help offset the cost of installing these practices.

- Informational and educational activities are employed to encourage participation.

- The DNR and DATCP review the progress of the counties and other implementing units of government, and provide assistance throughout the eight-year project. The DNR monitors improvements in water quality resulting from control of nonpoint sources of pollution in the watershed.

Priority Watershed Project Planning and Implementation Phases

Planning Phase

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

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

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

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

4. Determine levels of nonpoint source pollution control and measures necessary to improve and/or protect water quality.

5. Prepare and gain approval for a priority watershed plan documenting the above evaluations, implementation procedures and costs.

Implementation Phase

The implementation phase will begin in the fall of 1994 following review of the priority watershed plan by the Jackson and Trempealeau County Land Conservation Department, DNR, and DATCP staffs, a public hearing and approval by the DNR, DATCP, and the Board of Supervisors for Jackson and Trempealeau Counties. This phase is characterized below:

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

- In the rural portions of the watershed, the Jackson and Trempealeau County LCD(s) contact eligible landowners to determine their interest in voluntarily installing BMPs identified in the plan.

  In the urban portions of the watershed, the DNR or its designee will contact local units of government to discuss actions to implement plan recommendations.

- For rural practices, the landowner and the county sign cost-share agreements outlining the practices, costs, cost-share amounts and a schedule for installation of BMPs. All practices are scheduled for installation up to five years from the date the agreement is signed. The DNR and local units of government sign similar agreements for urban practices.

Legal Status of the Nonpoint Source Control Plan

The Upper Trempealeau River Priority Watershed Plan was prepared under the authority of the Wisconsin Nonpoint Source Water Pollution Abatement Program described in Section 144.25 of the Wisconsin Statutes and Chapter NR 120 of the Wisconsin Administrative Code. It was prepared under the cooperative efforts of the DNR, DATCP, the Jackson and Trempealeau County Land Conservation Departments, local units of government, and the Upper Trempealeau River Citizens Advisory Committee.

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

This watershed was selected in 1991, prior to Wisconsin Act 166, which was passed in 1993. Wisconsin Act 166 added a regulatory component, known as "critical sites", to the watershed program, which had previously been completely voluntary. The Upper Trempealeau watershed, because of its date of selection, will be a completely voluntary program, unless formally amended and reapproved by both Jackson and Trempealeau County Boards.

The approval process for a priority watershed plan is as follows: 1) public hearing held, 2) approval by both Jackson and Trempealeau County Boards, 3) approval by DNR, 4) approval by Wisconsin L&WC Board.

At the time this plan was approved, fall 1994, the administrative code NR 120 was undergoing revision. Proposed revisions include increased cost-share rates and an expanded list of eligible BMPs. These will be available in the Upper Trempealeau watershed once the NR 120 revisions are finalized.

Relationship of the Nonpoint Source Control Plan to the Integrated Basin Management Plan

The 112,338 acre Upper Trempealeau River Basin is comprised of the North Branch, the South Branch, the Tank Creek, the Stony, the Holmes Trempealeau, the Lowe Creek, the Curran Creek, the Main Trempealeau, the Pine Creek, the Jonah Creek, the Taylor Trempealeau, the French Creek, the Skutley Creek, the Vosee Creek, the Trump Creek, and

the Blair Trempealeau subwatersheds. The basin drains to Lake Henry in the city of Blair and occupies portions of 2 counties—Jackson and Trempealeau. Home to more than 3 thousand people, the basin contains 113.9 miles of streams and 1 major lake with a surface area of 43 acres.

The DNR has designed and implemented a new approach to natural resource management in the basin, an approach called "integrated resource management." The DNR uses the nonpoint source control program as the foundation for coordinating other departmental environmental quality (solid waste, wastewater, water regulation and zoning, water resources management, water supply) and resource management (fisheries, forest management, parks and recreation, wildlife and endangered resources management) efforts.

This coordinated program is documented in a report entitled the 1991 Trempealeau River Water Quality Management Plan. The plan establishes comprehensive goals and management strategies for the DNR's environmental quality and resource management programs. Also, the plan serves to coordinate departmental activities with similar efforts of local, state and federal units and agencies of government.

Importantly, recommendations contained in the water quality management plan are incorporated in this priority watershed plan. Consequently, this nonpoint plan meets the requirements of Section 144.25 of the Wisconsin statutes. This statute requires the DNR to develop "an integrated resource management strategy to protect or enhance fish and wildlife habitat, aesthetics, and other natural resources" for priority watersheds.

Plan Organization

The remainder of this plan is divided into three parts:

- The Watershed Assessment.
- A Detailed Program for Implementation.
- Project Evaluation.

The contents of each part are described below:

Part One: The Watershed Assessment

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

Chapter Three. "Water Resource Conditions, Nonpoint Sources and Water Resource Objectives" characterizes the existing and potential biological and recreational uses of surface

waters. The results of the nonpoint source inventories and evaluations and water resource objectives are discussed.

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

Part Two: A Detailed Program for Implementation

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

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

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

Part Three: Project Evaluation

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

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

CHAPTER TWO
General Watershed Characteristics

Location

The Upper Trempealeau River Watershed is a 112,338 acre drainage basin located east of Blair Wisconsin (map 2-1). The Upper Trempealeau River Watershed covers the entire drainage area to Lake Henry, an eutrophic impoundment. The reservoir is operated by the Village of Blair for control and as a source of water for low flow augmentation to the Trempealeau River. The outlet is directly connected to the Trempealeau River.

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

Cultural Features

Civil Divisions

The Upper Trempealeau River Watershed lies within Jackson and Trempealeau Counties. Incorporated areas in the watershed include the villages of Taylor, Blair, and Hixton. The main public land within the watershed is the Tank Creek, Vosse Coulee, Lowe Creek, and North Branch hunting and fishing areas.

Population Size and Distribution

The Upper Trempealeau River Watershed population is estimated to be about 3030 persons. Most of the watershed population lives in Hixton or Taylor, and surrounding areas. Population growth rates in the watershed are approximately 2 percent. All townships and villages have a growth rate over the past decade of at least 1 percent. Regional trends suggest that the watershed's population will continue to increase.

Land Uses

Agricultural land uses predominate in the watershed. Cropland use is the most important land use, comprising 51.9 percent. Dairy farming is the primary enterprise, with the average farm size being 200 acres. Jackson County ranks 39th statewide in milk production. Woodlands are abundant and cover 39.0 percent of the land area. Developed land uses occupy less than 2 percent of the watershed (table 2-1).

Table 2-1. Summary of Land Uses in the Upper Trempealeau River Watershed

Land Uses	Acres	Percent
Agricultural		
pasture	4,000	4
cropland	58,313	52
Grassland	1,975	2
Woodland	44,000	39
Developed	1,240	1
Mined	1600	1
Wetland*	1,410	1
Total	112,338	100

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

Source: DNR

Special Land Uses

A large sand deposit lies within the Vosse Coulee Creek subwatershed. Badger Mining mines and produces high quality silica sand for the oil, foundry, abrasive, and filtration industries.

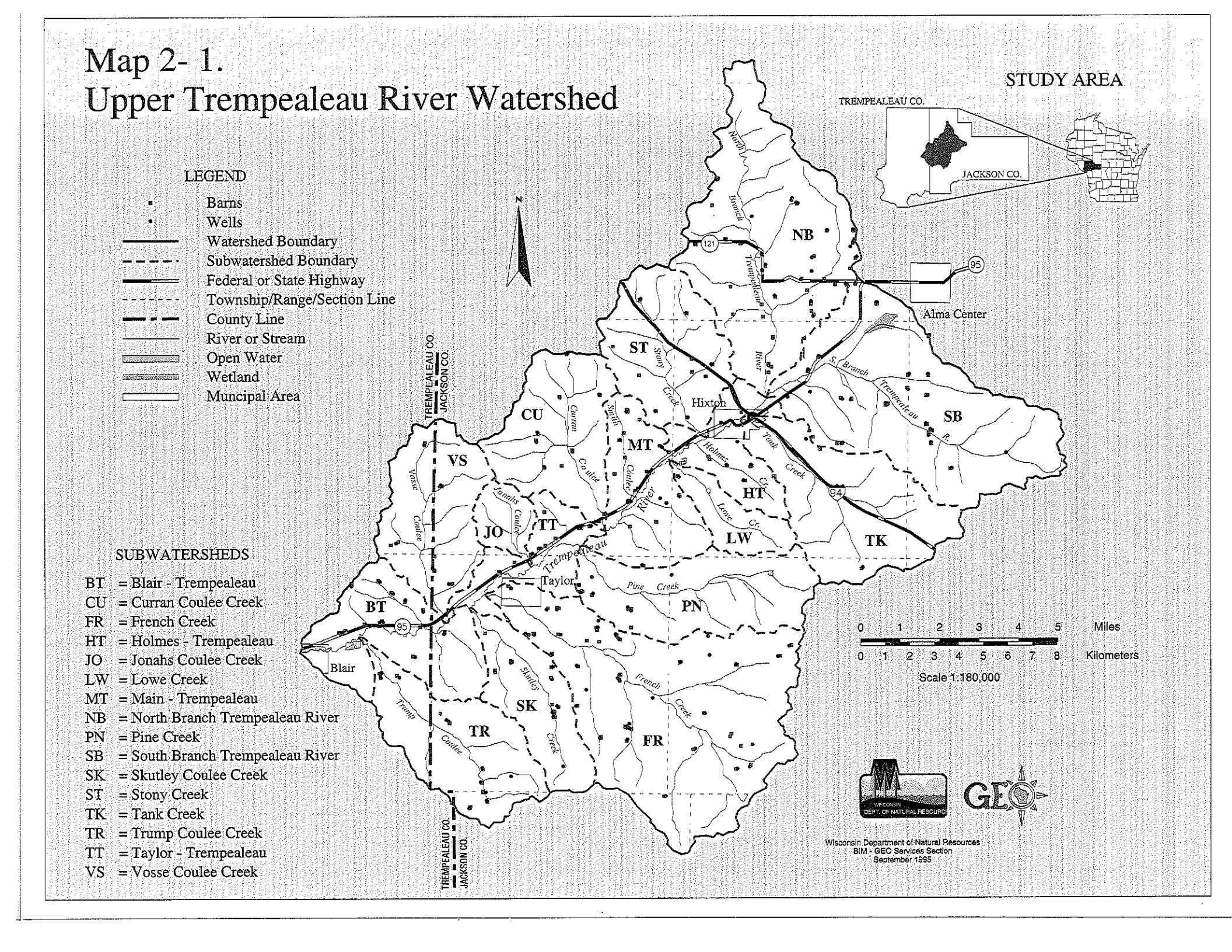
BADGER MINING CORPORATION

The sand mined at the Taylor location is 99.8% pure silica. The Taylor Plant mines and processes high quality silica sand for many industrial uses: oil, foundry, abrasive, and filtration industries.

Oil & Gas

Silica sand is used to increase production from oil and gas wells. It is used to fracture the layers of rock, then to prop open the fracture; and finally, to filter the recovered oil.

Map 2- 1.
Upper Trempealeau River Watershed



SUBWATERSHEDS

BT = Blair - Trempealeau
CU = Curran Coulee Creek
FR = French Creek
HT = Holmes - Trempealeau
JO = Jonahs Coulee Creek
LW = Lowe Creek
MT = Main - Trempealeau
NB = North Branch Trempealeau River
PN = Pine Creek
SB = South Branch Trempealeau River
SK = Skutley Coulee Creek
ST = Stony Creek
TK = Tank Creek
TR = Trump Coulee Creek
TT = Taylor - Trempealeau
VS = Vosse Coulee Creek

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Foundry

Silica sand is used to make cores and molds necessary in the manufacturing of engines, brakes, pump parts, and countless casting applications. It is used in the green sand process and the various chemically-bonded processes.

Abrasive

Silica sand is used as an abrasive material to clean a surface. Abrasive blasting is the propelling of sand or other hard particles at a surface.

Filtration

Silica sand is used to filter water in pools, water facilities, and waste treatment plants.

Stages of the Taylor mining process begin with exploration and excavation. Following next are the mining, washing, and drying of the sand. The mining process concludes with the loadout, shipping, and reclamation stages.

The exploration process begins with reviewing geological maps and well records to locate the land with possible sandstone deposits. Badger Mining's Taylor mine site was discovered when holes were drilled and tests revealed a high quality and quantity of sandstone reserves. As the mine plan advanced across the hills, holes continued to be drilled to test the reserves. When good quality and quantity are discovered, then the process of excavation begins.

Excavation is the removal of overburden, such as trees, top soil, and shale, which allow the exposure of the sandstone deposit. Trees are removed for use as lumber. Top soil is removed and stockpiled for land reclamation. Shale overburden, ranging from 40 to 80 feet, is removed to expose the sandstone deposit, making it available for the mining process.

The mining process transforms sandstone into individual sand grains. Blasting, crushing, surveying, and screening are processing methods in the mining stage. Explosives are used to break up the sandstone. After blasting, sandstone is fed into a jaw crusher. The jaw crusher breaks large sandstone chunks into sand and smaller stones less than two inches in diameter. This sand and stone mixture is transported from the jaw crusher to the vibrating screener by a conveyor system. The screener removes stone pieces larger than 3/4 of an inch. Pieces smaller than 3/4 inch are stockpiled until needed by the wash process.

The wash process sizes, cleans, and stockpiles sand. Water is used in a whirlpool-type process to size the sand material to the desired ranges. Large grains drop to the bottom of the wash tank and small grains float to the top. Sand grains are then scrubbed and rinsed to remove clays. Washed sand is placed on stockpiles for storage and removal of excess water. Stockpiles are the winter reserves for the dry process.

The dry process stage involves the drying, screening, and silo storage of sand. Natural gas fired rotary kilns are used to dry sand. Dried sand is then screened to produce multiple grades of sand products. Finished products are stored in silos, which serve as part of the loadout system.

The final stages include loadout, shipping, and reclamation.

Sand is transported, in bulk or packaged form, to customers in the United States and several foreign countries. Deliveries to customers are by truck or rail. Trucks load bulk sand from storage silos in the plant. Rail cars are loaded directly by a conveyor system to the rail spur. Sand is also packaged in 50lb, 100lb., or 3000lb bags or containers.

Areas no longer being mined are refilled with waste sands. These sands are covered with shale and the reserved top soil, and then seeded with assorted grasses and planted with trees.

Municipal and Industrial Point Sources of Water Pollution

Discharges of wastewater from permitted municipal and industrial sources (known as point sources of pollution) are important considerations for improving and protecting surface water resources. An inventory of point sources is presented in the 1991 Buffalo-Trempealeau River Water Quality Management Plan. Most of these point sources are controlled through permits that the DNR (DNR) issues under the Wisconsin Pollution Discharge Elimination System (WPDES). Importantly, a major effort to reduce pollution from combined sewer overflows and discharges from separate sanitary relief devices is underway.

Sanitary Sewer Service

Sanitary sewer service availability is limited throughout the Upper Trempealeau River Watershed. Approximately 780 persons, 26 percent of the watershed population, receive service. The villages of Taylor and Hixton provide service for their residents. Treated wastewater from municipal wastewater treatment plants is discharged in the Upper Trempealeau River Watershed. Wastewater generated by the remainder of the watershed residents is disposed of through private on-site systems.

Water Supply Service

Water supplies used in the Upper Trempealeau River Watershed are obtained from both groundwater sources and municipal systems providing water service from groundwater. Water obtained from these aquifers is either pumped from individual wells owned by homeowners or businesses, or is obtained through municipal pumping facilities.

Municipal water supply systems supply more than 26 percent of the watershed population. The villages of Hixton, Taylor, and Blair provide water obtained from the groundwater to their residents. Individual municipal supply systems provide water obtained primarily from the groundwater.

Natural Resource Features

Climate and Precipitation

The frequency, duration and amount of precipitation influences surface and groundwater quality and quantity, soil moisture content, runoff characteristics, and the physical condition of waterways. The Upper Trempealeau River Watershed lies in the continental zone which is characterized by winters which are long and relatively cold and snowy and summers which are mostly warm with periods of hot humid conditions. Mean annual precipitation for the region is about 33 inches of rain and melted snow; the majority falls in the form of thunderstorms during the growing season (May-September). Most runoff occurs in February, March, and April when the land surface is frozen and soil moisture is highest.

Topography

The Upper Trempealeau River Watershed is located within the Western upland. This region is gently sloping to steep with relatively rich soils, and is primarily an agricultural area.

Geology and Soils

The Upper Trempealeau River Watershed lies within an area of Upper Cambrian sandstones. These sandstones are composed of quartz in the lower formations and glauconite in the upper formations. These formations have a low dip to the west-southwest, at about one degree. Much of these sandstone formations have been reduced by mass wastage and form long slopes mantled by wind blown silts.

About 30 percent of the watershed is underlain by soils of the Bilson-Elevasil-Merit Association. The Bilson series consists of very deep, well drained, moderately permeable soils on pediments and stream terraces. This soil formed in loamy alluvium underlain by siliceous sands. Slope ranges from 0 to 45 percent.

About 30 percent of the watershed is underlain by soils of the Tarr-Boone-Rockdam Association. The Tarr series consists of very deep, somewhat excessively drained, rapid permeable soils on pediments and stream terraces. This soil formed in silicious sandy deposits. Slope ranges from 0 to 45 percent.

About 20 percent of the watershed is underlain by soils of the Seaton-Council Association. The Seaton series consists of very deep, well drained, moderate permeable soils on hills in bedrock controlled uplands. This soil formed in silty deposits. Slope ranges from 0 to 30 percent.

About 20 percent of the watershed is underlain by soils of the Urne-Council-LaFarge Association. The Urne series consists of moderately deep, well drained, moderate rapid permeable soils on hills in bedrock controlled uplands. This soil formed in loamy deposits and is underlain by glauconitic sandstone. Slope ranges from 2 to 30 percent.

Surface Water Resources

Land drainage patterns in the Upper Trempealeau River Watershed are delineated as 16 individual subwatersheds. All convey surface water directly or via tributaries to the Upper Trempealeau River. Major tributaries, associated streams, wetlands, and subwatershed divides are shown in map 2-1. See table 2-2 for the general conditions of major water resources in the Upper Trempealeau River Watershed.

Subwatersheds in the Upper Trempealeau River Watershed

Blair Trempealeau	(BT)
Curran Coulee Creek	(CU)
French Creek	(FR)
Holmes-Trempealeau	(HT)
Jonah's Coulee Creek	(JO)
Lowe Creek	(LW)
Main Branch Trempealeau	(MT)
North Branch	(NB)
Pine Creek	(PN)
South Branch	(SB)
Skutley Creek	(SK)
Stony Creek	(ST)
Tank Creek	(TK)
Trump Coulee Creek	(TR)
Taylor Trempealeau	(TT)
Vosse Coulee Creek	(VS)

Streams

Streams are the predominant surface water feature, perennial streams, which have a combined length of about 113.9 miles, maintain at least a small continuous flow throughout most of the year. The Upper Trempealeau River (16 miles) is the longest perennial stream in the watershed. Other primary streams in the watershed are North Branch Trempealeau, South Branch Trempealeau, Curran Coulee Creek, French Creek, Holmes, Jonah's Coulee Creek, Lowe Creek, Pine Creek, Skutley Creek, Stony Creek, Tank Creek, Trump Coulee Creek, and Vosse Coulee Creek.

While the lower portion of the Upper Trempealeau River supports a warm water sport fishery, the upland watersheds contain approximately 100.7 miles of cold water streams including 73.2 miles of classified trout waters. The Trempealeau River and many other streams are not reaching their highest potential use due to pollution from nonpoint sources. Eroding croplands and streambanks and improperly managed livestock operations are the major sources of nonpoint pollution in the watershed. Trump Coulee Creek, Holmes, and Turi Creek support a warm water forage fishery and a limited forage fishery. The fishery status in the remaining streams in the watershed is unknown.

Intermittent streams flow only when there is runoff or when groundwater discharge is highest. Intermittent waterways are the headwaters of many of the larger perennial streams. Their small size makes them particularly susceptible to nonpoint source pollution. If pollution sources are reduced, however, their dynamic nature does allow rapid improvement.

Upper Trempealeau River Lakes

Lake Henry was created in 1873 by a grist-mill-dam on the Trempealeau River at Blair, Wisconsin. The lake is close to 43 acres at full pool and has 12 miles of shoreline. The entire south shore of the lake is bordered by a 25-acre municipal park. The lake receives drainage from both the lower and upper portion of the Upper Trempealeau River Watershed. It is the largest body of water in the Upper Trempealeau Watershed, and it offers a diverse recreational resource, including picnicking, boating and year-round fishing. The lake has a history of water quality problems including fish kills from drawdown during winter ice cover, eutrophication, algae blooms, excess levels of sediment, nutrients and organic matter.

Table 2-2. General Condition of Major Water Resources in the Upper Trempealeau River Watershed

Water Body	Biological Use		Problems Related to Non-point Source Pollution
	Current	Potential	
RIVERS AND STREAMS			
Blair Trempealeau	WWFF 6.7 miles	Same	cattle grazing, cropland runoff, stream Bank erosion
Curran Creek	Cold(III) 5.0 miles	Cold(II) 5.0 miles	cattle grazing, cropland runoff
French Creek	Cold(I) 15.6 miles	Same	cattle grazing, cropland runoff
Holmes Trempealeau	WWFF 4.7 miles	Same	cattle grazing, cropland runoff, streambank erosion
Jonah's Coulee Creek	Cold(II) 2.3 miles	Same	cattle grazing, cropland runoff, streambank erosion
Lowe Creek	Cold(II) 1.0 miles Cold(III) 1.7 miles	Same Cold(I) 1.7 miles	impoundment
Main Trempealeau	Cold(II) 5.8 miles	Same	
North Branch Trempealeau River	Cold(I) 12.0 miles Cold(III) 5.0 miles	Same Cold(II) 5.0 miles	barnyards, cattle grazing, cropland runoff
Pine Creek	Cold(I) 5.5 miles	Same	cattle grazing, streambank erosion

Water Body	Biological Use		Problems Related to Non-point Source Pollution
	Current	Potential	
RIVERS AND STREAMS			
South Branch Trempealeau	Cold(II) 11.0 miles	Cold(I) 11.0 miles	cattle grazing, point source
Skutley Creek	Cold(II) 6.0 miles	Cold(I) 6.0 miles	cattle grazing, streambank erosion
Stony Creek	Cold(III) 5.0 miles	Cold(II) 5.0 miles	cattle grazing, streambank erosion
Tank Creek	Cold(I) 5.0 miles	Same	none
Trump Creek	WWFF 8.0 miles	Cold(II) 2.0 miles Cold(III) 6.0 miles	cattle grazing, streambank erosion, barnyards
Taylor Trempealeau	Cold(II) 4.0 miles	Same	cattle grazing, cropland runoff
Vosse Coulee Creek	Cold(I) 9.6 miles	Same	cattle grazing, cropland runoff, streambank erosion
LAKES AND IMPOUNDMENTS			
Lake Henry	WWFF	Same	
Trump Lake	WWFF	Same	

Lake Henry is one of the storage reservoirs in the Trempealeau River Drainage area. The outlet is directly connected to the Middle Trempealeau River.

Wetlands

Wetlands are valuable natural resource features. Their values include wildlife habitat, fish spawning and rearing, recreation, attenuation of runoff and flood flows and removal of pollutants. Wetlands in the watershed are mainly in the Upper Trempealeau River floodplain. Floodplain wetlands support furbearers and water fowl populations and may provide seasonal habitat for sportfish.

Groundwater Resources

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

Since 1936, the State of Wisconsin has required well drillers to document well construction and rock and soil layers encountered during well installation. Geologic logs and Driller Construction reports for private wells located in the watershed indicate that two major aquifers are used to obtain drinking water. These aquifers consist of the following from the surface down: 1) the glacially deposited sand and gravel aquifer, and 2) the sandstone aquifer deposited approximately 500 million years ago.

The sand and gravel aquifer ranges from 5 to 191 feet below the ground surface. The Cambrian sandstone ranges from 5 to 408 feet below the ground surface. Driller construction reports indicate that the depth to groundwater ranges from 0 to 205 feet below the ground surface. Wells yield between 4 and 1300 gallons per minute depending on the depth of the well and the type of aquifer.

Direction of Groundwater Flow

In general, regional groundwater flow is southwest toward the Mississippi River. Locally, groundwater flows toward the Trempealeau River.

Groundwater Quality

Groundwater quality in the Upper Trempealeau River Watershed is generally not considered good, needs improvement, and represents a potential health threat. As part of the Water Quality Appraisal conducted during 1992, private well samples were collected and analyzed for nitrates and atrazine. Sample analytical results for Jackson County are summarized in table 2-4. Samples analyzed for nitrate showed concentrations ranging from undetected to 26.4 parts per million. One part per million is equivalent to one drop of water in a 10-gallon fish tank. The groundwater enforcement standard (ES) for nitrate is 10 mg/l as defined in chapter NR 140, Wis. Adm. Code. Nitrate concentrations above 2 mg/l exceed the states preventive action limit (PAL).

Table 2-4. Well Sampling Results: Upper Trempealeau River Watershed

TRIAZINE						
	Number of Triazine Samples		Number of Triazine Samples		Number of Triazine Samples	
Subwatershed	less than 0.3 µg/l	%	between 0.3 and 3.0 µg/l	%	greater than 3.0 µg/l	%
North Branch	23	88	2	8	1	4
South Branch	16	67	6	25	2	8
Tank	2	40	1	10	2	40
Stony	6	100	0	0	0	0
Holmes Trempealeau	3	100	0	0	0	0
Lowe	2	100	0	0	0	0
Curran	8	89	1	11	0	0
Main Trempealeau	12	75	4	25	0	0
Pine	6	100	0	0	0	0
Jonah	0	0	1	100	0	0
Taylor Trempealeau	1	100	0	0	0	0
French	26	79	7	21	0	0
Skutley	8	73	3	27	0	0
Vosee	5	83	1	17	0	0
Trump	10	91	1	9	0	0
Blair Trempealeau	10	91	1	9	0	0
Totals	138	81	28	16	5	3

NITRATE						
	Number of Nitrate Samples		Number of Nitrate Samples		Number of Nitrate Samples	
Subwatershed	less than 2.0 mg/l	%	between 2.0 and 10.0 mg/l	%	greater than 10.0 mg/l	%
North Branch	3	11	14	54	9	35
South Branch	5	21	10	41	9	38
Tank	1	20	1	20	3	60
Stony	4	67	2	33	0	0
Holmes Trempealeau	1	33	2	67	0	0
Lowe	1	50	0	0	1	50
Curran	7	78	2	22	0	0
Main Trempealeau	6	37	7	44	3	19
Pine	2	33	2	33	2	33
Jonah	0	0	0	0	1	100
Taylor Trempealeau	0	0	1	100	0	0
French	8	24	13	40	12	36
Skutley	3	27	5	46	3	27
Vosse	4	67	2	50	0	0
Trump	6	55	5	45	0	0
Blair Trempealeau	6	55	4	0	1	9
Totals	57	33	70	41	44	26

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

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

Forty-four (44) samples (28 percent) exceeded 10 mg/l and 70 samples (41 percent) of the samples exceeded 2 mg/l. Results so far do not indicate a pattern of groundwater contamination that can be linked to specific sources of nitrate.

Concentrations of atrazine in the Upper Trempealeau River Watershed ranged from undetected to 37.8 micrograms per liter (µg/l). One microgram per liter is comparable to one drop in 10,000 gallons (a small swimming pool). Five samples (three percent) exceeded the enforcement standard (ES -health advisory level) while 83 samples (53.2 percent) had detects of triazine. As with nitrate contamination, no specific source of contamination is indicated by the results. In April, 1994 an Atrazine Prohibition Area was enacted for designation in parts of the North Branch, South Branch, Tank, Holmes Trempealeau, and Lowe subwatersheds. The area covers all or portions of 26 sections (12,800 acres) in the towns of Albion, Garden Valley, and Hixton. The use of atrazine is prohibited in this area.

Bi-weekly bacteriological samples were collected during summer 1992 from a swimming area on the south side of Lake Henry in Blair. The samples were collected by Trempealeau County Land Conservation Department personnel and shipped with ice to the State Laboratory of Hygiene for fecal coliform and fecal streptococcus analysis.

Coliform bacteria can be a drinking water problem where septic systems or barnyards are located uphill from a private well. Bacteria can enter the drinking water supply along the well casing of improperly constructed and located wells. Wells with high levels of bacteria can be rehabilitated and used.

No samples were collected for hazardous substances such as volatile organic compounds. Volatile organic compounds generally enter a well from nearby leaking underground gasoline or other fuel storage tanks. Once these compounds are in the groundwater they are difficult to clean up. In general, the contaminated wells have to be abandoned and a new well drilled to an uncontaminated and usually deeper aquifer.

Potential Groundwater Quality Problems

The section of Chapter Three that describes "other pollutant sources" includes lists of superfund sites, solid and hazardous waste disposal sites, leaking underground storage tank sites and reported spill sites.

Archaeological Sites: Coordination with State and Federal Historic Preservation Laws

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

There is one known archaeological site within the Upper Trempealeau River Watershed. The site is located at Silver Mound northeast of Hixton. These areas will need special consideration when structural best management practices are being considered. Settling basins, manure storage structures, and streambank or shoreline shaping and riprapping are likely practices that may impact archaeological sites. As discussed above, state and federal laws require preservation of archaeological resources within the framework of the NPS Program.

The Upper Trempealeau River Priority Watershed Project will address these concerns with the following procedures:

1. Jackson and Trempealeau Counties will obtain inventory maps from the regional Wisconsin State Historical Society office, and will plot sites on topographic maps. Counties will also obtain a supply of landowner questionnaires from the historical society which will be used to identify additional non-inventoried sites.

2. Landowners' questionnaires will then be sent to the State Historical Society for determination of archaeological significance. In addition, landowners will have their lands evaluated by county staff for the need to conduct an archaeological survey (essentially compare property with known archaeological site locations). The historical society will determine the need for additional, extensive surveys. The counties and the DNR District NPS Program coordinator will also be involved in this determination.

3. If the inventory or questionnaire does reveal an archaeological site and the proposed best management practice may impact the site, an archaeological survey conducted by a qualified archaeologist will need to be completed. The survey will assess the potential of the practice to significantly impact the site. Alternative BMPs may need to be considered both before and after the results of the survey.

4. A cost-share agreement is signed before the survey is conducted. In certain instances a survey may reveal a significant archaeological site which precludes the installation of a particular BMP at that specific site. Cost-share agreements will contain language which nullifies or partially nullifies the cost-share agreement based on the final results of the archaeological survey.

Endangered and Threatened Resources

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

In addition the Bureau's endangered resource files are continuously updated from ongoing field work. There may be other records of rare species and natural communities which are in the process of being added to the database and so are not in the lists below.

Rare Species

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

Wisconsin Endangered Species

Any species whose continued existence as a viable component of this state's wild animals or wild plants is determined by the DNR to be in jeopardy on the basis of scientific evidence. Wisconsin endangered species within the watershed are *Notropis Amnis* (pallid shiner) and *Sistrurus Catenatus Catenatus* (eastern massasauga).

Wisconsin Threatened Species

Any species which appears likely, within the foreseeable future, on the basis of scientific evidence, to become endangered. Wisconsin threatened species within the watershed are *Clemmys Insculpta* (wood turtle) and *Lythrurus Umbratilis* (redfin shiner).

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

Wisconsin Special Concern Species

Any species about which some problem of abundance or distribution is suspected in Wisconsin, but not yet proven. The purpose of this category is to focus attention on certain species before they become endangered or threatened. Wisconsin special concern species within the watershed are *Carex Folliculata* (long sedge), *Etheostoma Asprigene* (mud darter), and *Scleria Triglomerata* (tall nut rush).

Natural Areas

Natural areas are sites that contain high quality examples of natural communities. The following natural areas have been identified in the Upper Trempealeau River Priority Watershed. The natural communities found at each area are also listed.

Pine Creek - Northern Dry-Mesic Forest
Vosse Coulee - Northern Sedge Meadow
Hart Oaks - Southern Dry-mesic Forest
Pine Creek - Stream--Fast, Soft, Cold
Vosse Coulee - Stream--Slow, Hard, Cold

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

CHAPTER THREE
Water Quality Conditions, Water Quality Objectives and Nonpoint Sources

Introduction

Topics covered in this chapter include:

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

Major Nonpoint Source Pollutants

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

Manure

Manure contains several components that adversely affect water quality and aquatic life. Manure entering a stream breaks down, resulting in depletion of the oxygen in the water which fish and other aquatic life require to survive. Also, manure contains nitrogen which can form ammonia in the streams and lakes. In high concentrations the ammonia is toxic to fish and other aquatic life. Ammonia toxicity is temperature and Ph dependent. The nutrients in manure (including nitrogen and phosphorus) also promote nuisance algae and weed growth in the streams and lakes. Finally, the bacteria found in livestock manure is harmful to livestock drinking the water, and to humans using the water for recreation. The major sources of manure in this watershed are runoff from barnyards and runoff from improperly field-spread manure.

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

Sediment

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

Nitrates

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

Water Quality Conditions and Recreational Uses

Streams

Named streams in this watershed include the Trempealeau River, North Branch Trempealeau River, South Branch Trempealeau River, Tank Creek, Stony Creek, Holmes, Lowe, Curran Creek, Pine Creek, Jonah, French Creek, Skutley, Vosse and Trump. The Trempealeau River is the primary stream in the watershed. It begins as the North Branch and South Branch which intersect in Hixton, which is in the North Central part of Jackson County. The Trempealeau River flows Southwesterly for 16 miles, where it empties into Lake Henry which flows to the Mississippi River near Winona, Minnesota. The Upper Trempealeau River has a cold water sport fishery including Brook trout, Brown trout, and numerous Rainbow trout. The river also supports Johnny darter, Blacknose dace, White sucker, and Creek chub. Biotic indexes range from good to fair. See Appendix A for information on biotic index.

Lake Henry

Lake Henry exhibits variable water quality with seasonally heavy aquatic weed growth. The lake is capable of producing an outstanding sport fishery. However it has been characterized as hypereutrophic and has a history of fish kills and algae blooms.

The remaining streams in the watershed will be described in more detail in the subwatershed descriptions later in this chapter. For a more thorough description of any subwatershed, see the Upper Trempealeau River Priority Watershed Water Resources Appraisal (Schreiber, 1994).

Recreational Uses

The watershed's streams, wetlands, and the reservoir offer diverse and high-quality recreational opportunities. The most popular activities are fishing and canoeing on the reservoir. Other popular activities are wildlife observation, hiking, hunting, and trapping.

Lake Henry is used for a wide range of recreational activities. It is of local importance because it draws many people from West Central Wisconsin where there are very few lakes large enough for most boating or deep enough to support a quality fishery. Recreational facilities on the Lake include a large municipal park on the South shore with two swimming beaches, campgrounds, picnic areas, private and commercial facilities for camping, several boat landings and a moderate amount of recreation and private year round housing.

Water Quality Objectives

The DNR staff with assistance from the Jackson and Trempealeau County Land Conservation Department staffs and the DATCP developed water quality objectives. Objectives were identified for each subwatershed and are listed in the following subwatershed descriptions. Details of objective development can be found in the Upper Trempealeau River Priority Watershed Water Resource Appraisal (Schreiber, 1994).

Following are the general objectives for streams and the reservoir:

1. Protection: Protection refers to maintaining the present biological and recreational uses supported by a stream or the reservoir. For example, if a stream supports a healthy coldwater fishery and is used for full-body contact recreational activities, the objective seeks to maintain those uses.

2. Enhancement: Enhancement refers to a change in the overall condition of a stream or lake within its given biological and recreational use category. For example, if a stream supports a warmwater fishery whose diversity could be enhanced, the objective focuses on changing those water quality conditions which keep it from achieving its full biological potential.

3. Restoration: Restoration refers to upgrading the existing capability of the resource to support a higher category of biological use. An example would be a stream which historically supported healthy populations of warmwater game fish, but no longer does. This objective seeks to improve conditions allowing viable populations of forage and warmwater game fish species to become reestablished.

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

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

COLD = Coldwater Communities include surface waters capable of supporting a community of coldwater fish and other aquatic life or serving as a spawning area for coldwater fish species.
WWSF = Warmwater Sport Fish Communities include surface waters capable of supporting a community of warmwater sport fish and/or serving as a spawning area for warmwater sport fish.
WWFF = Warmwater Forage Fish Communities include surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.
LFF = Limited Forage Fish Communities

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

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

See table 3-1 for a summary of the water resource conditions and objectives for the Upper Trempealeau River Watershed.

Table 3-1. Water resource conditions and objectives for the Upper Trempealeau River and major streams in the Upper Trempealeau River Watershed

Subwatershed	Stream Name	Length (Miles)	Biological Use* Current Use/Miles	Potential Use/Miles	Supporting Potential Use Fully-Part-Not (Miles)	Limiting Factors**	Observed or Potential Sources***	Water Resource Goals
Lowe	Lowe Creek	1.0 1.7	Cold(II)/ 1.0 Cold(III)/1.7	Same Cold(I)/ 2.7		HAB TEMP,HAB, DO	IMP	Improve to Class I fishery Improve to Class I fishery
Curran	Curran Creek	5.0	Cold(III)/5.0	Cold(II)/5. 0		HAB,SED	CG,CR	Improve to Class II fishery
Pine	Pine Creek	5.5	Cold(I)/5.5	Same		HAB,SED	CG,SE	Improve trout reproduction and carryover
Jonah	Jonah Coulee Creek	2.3	Cold(II)/2.3	Same		SED,HAB	CR,CG,SE	Improve to Class II fishery
French	French Creek	15.6	Cold(I)/15.6	Same		HAB,SED	CG,CR	Improve trout reproduction and carryover
Skutley	Skutley Coulee Creek	6.0	Cold(II)/6.0	Cold(I)/6.0		SED,HAB	CG,SE	Improve to Class I fishery
Vosse	Vosse Coulee Creek	9.6	Cold(I)/9.6	Same		SED,HAB	CG,SE,CR	Improve trout reproduction and carryover
Trump	Trump Coulee Creek	8.0	WWFF/8.0	Cold(II)2.0 Cold(III)6. 0		SED,HAB, DO,TEMP	CG,SE,BY	Improve to Class II(Jackson Co.) Improve to Class III(Tremp. Co.)
Blair Trempealeau	Turi Coulee Creek Trempealeau River	1.4 5.3	WWFF/1.4 WWFF/5.3	Same Same		SED,HAB, TEMP SED,BACT	CR,CG,SE CG,CR	Maintain forage fishery Increase carryover of adult trout. Reduce bacteria and sediment in Lake Henry.
Main Trempealeau	Trempealeau River	5.8	Cold(II)/5.8	Same		SED,BACT	CG,CR	Increase carryover of adult tout. Reduce Bacteria levels in Lake Henry. Reduce sediment in Lake Henry.

Table 3-1 Continued

Subwatershed	Stream Name	Length (Miles)	Biological Use* Current Use/Miles	Potential Use/Miles	Supporting Potential Use Fully-Part-Not (Miles)	Limiting Factors**	Observed or Potential Sources***	Water Resource Goals
North Branch	North Branch Trempealeau River	12.0	Cold(I)/12.0	Same		SED	BY,CG	Improve trout reproduction and carryover.
	Judkins Creek	5.0	Cold(III)/5.0	Cold(II)/5.0		SED,HAB	CB,CG	Improve to Class II fishery.
Taylor Trempealeau	Trempealeau River	4.0	Cold(II)/4.0	Same		SED,BAC	CR,CG	Increase carryover of adult trout. Reduce bacteria and sediment levels in Lake Henry.
South Branch	South Branch Trempealeau River	9.0	Cold(II)/9.0	Cold(I)/9.0		SED,HAB	PS,CG	Improve to Class I fishery.
South Branch	Amo Creek	2.0	Cold(II)/2.0	Cold(I)/2.0		SED,HAB, TEMP	CG	Improve to Class I fishery.
Tank	Tank Creek	5.0	Cold(I)/5.0	Same		None	None	Protect Class I fishery.
Stony	Stony Creek	5.0	Cold(III)/5.0	Cold(II)/5.0		SED,HAB	CG,SE	Improve to Class II fishery.
Holmes Trempealeau	Holmes Creek Trempealeau River	1.8	WWFF/1.8	Same		HAB,SED, TEMP	CG,CR,SE	Maintain forage fishery.
		2.9	WWFF/2.9	Same		SED,BACT	CG,CR	Increase carryover of adult trout. Reduce bacteria and sediment levels in Lake Henry.

Table 3-1 Continued

Subwatershed	Stream Name	Length (Miles)	Biological Use* Current Use/Miles	Potential Use/Miles	Supporting Potential Use Fully-Part-Not (Miles)	Limiting Factors**	Observed or Potential Sources***	Water Resource Goals

LEGEND:

a The current use classification listed in NR 104.
b Trout stream identified in the "blue" Trout Stream Book (DNR,1980).
c A formal classification or classification review has been completed and approved. (These are classifications that have been completed but for one reason or another will not appear in NR 104).
d A formal classification or classification review has been completed. Based on this analysis the current NR 104 is incorrect and should be changed the next time NR 104 is revised.
e Recent studies or the professional judgement of a fish manager or aquatic biologist familiar with the water indicates this is the biological use the stream is currently meeting or has the potential to meet.
f Other information used

* **Biological Use, Existing** - this column indicates the existing biological use supported by the stream as defined in NR 102 (04)(3) under fish and aquatic life uses.
COLD - coldwater communities
WWSF - warmwater sport fish communities
WWFF - warmwater forage fish communities
LFF - limited forage fishery (intermediate surface waters)

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

Supporting Potential Use: This column indicates whether a stream 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 by some manageable factor, and the biological use of the stream can probably be improved.

** **Limiting Factors**
HAB - Habitat (lack of cover, sedimentation scouring etc.)
SED - Sedimentation (filling in of pools)
TEMP - Temperature (extreme high for trout)
DO - Dissolved Oxygen (to low)
FLOW - Flooding or fluctuating water levels
ALG - Algae (abundant)
NUT - Nutrient enrichment
TURB - Turbidity
BAC - Bacteria (MMFCC/100ml)
IMP - Impoundment
CG - Cattle Grazing
CR - Cropland Runoff
SE - Streambank Erosion
PS - Point Source

*** **Observed or Potential Sources**
NPS - Unspecified nonpoint sources
CL - Cropland erosion
SL - Shoreline erosion
SB - Streambank erosion
PSB - Streambank pasturing
BY - Barnyard or exercise lot runoff
PSM - Point source, municipal treatment plant discharge
PSI - Point source, industrial discharge (rotten granite pit dewatering)
NMM - Non-metallic mining (rotten granite/gravel)

Subwatershed Discussions

The subwatersheds are shown on maps 3-1 through 3-13. For a thorough discussion of each, see the Upper Trempealeau River Priority Watershed Water Resource Appraisal (Schreiber, 1994). Most of the water quality information is listed in table 1. In subwatersheds where there is information not appearing in table 3-1, a description is included below.

General Watershed Summary

Most of the perennial tributaries to the Trempealeau River in this watershed have coldwater fish communities and support a trout fishery. The Upper Trempealeau river Watershed has 6 Call I, 5 Class II and 4 Class III trout streams and several warmwater forage fishery streams. The Trempealeau River above Lake Henry is primarily used for fishing and supports a limited coldwater sport fishery. Fish surveys conducted on 20 streams in the watershed in 1991-92 found brook and brown trout and 16 minnow and forage fish species. White sucker, common creek chub, blacknose dace, brook stickleback and Johnny darter were the most common forage species.

Common water resource problems in the watershed include streambank erosion, sedimentation of riffle and pool areas, organic loading from animal waste and elevated water temperatures. In recent years, the watershed streams have experienced both drought and unusually severe flooding. Many of the streams have vegetated corridors which are too narrow to provide an adequate buffer from cropland runoff.

The primary causes of streambank erosion appear to be a combination of excessive cattle grazing of streambanks and flooding events. A frequent consequence of this bank erosion is sedimentation of pools, filling-in of riffle areas (measured as embeddedness) reduces reproductive success of trout by reducing inter-gravel flow which is necessary to maintain suitable temperature and oxygen conditions for eggs and fry. Sedimentation of riffle areas also reduces suitable habitat for macroinvertebrates and other fish food organisms. Filling-in of pools reduces the amount of available cover for juvenile and adult fish.

Organic loading affects water quality by reducing stream dissolved oxygen conditions which can stress fish and other aquatic life. based on appraisal findings, overall oxygen conditions are generally good in the watershed streams, however, some streams show evidence of organic pollution. The primary source of this organic loading is livestock wasted from barnyards, pastures, feedlots and manure spread on fields.

Several of the watershed streams have a shifting sand substrate which limits the amount of suitable habitat for fish and fish food organisms. Macroinvertebrate biomass is generally lower in areas with a predominantly sane substrate than a stream substrate with a mix of gravel, rubble and sand. Habitat suitable for some macroinvertebrate species is generally limited to riffle areas below bridge abutments where rubble and gravel from rip-rap is present.

Flooding is an annual (or more frequent) occurrence in the Trempealeau watershed. Some of the watershed streams show evidence of high flood crests and excessive bank erosion due to

flooding. Unstable streambanks in both wooded and open areas are prone to sloughing-off and contributing sediment to the streambed during high water events. Flooding in the watershed is primarily due to a combination of rolling topography and the predominance of intensive agricultural land use. It is likely that high water extremes could be reduced to some extent by improved land management practices that would increase infiltration and reduce peak runoff rates.

Nonpoint Source Pollutants

The inventories of nonpoint source pollutants are summarized in tables 2 through 4.

Blair Trempealeau Subwatershed (BT)

Water Quality Conditions

The Trempealeau River above Blair is managed as a Class II brook and brown trout fishery. Fishing pressure is very heavy during the early part of the fishing season, but moderate during the remainder of the season.

Lake Henry is used for swimming. Bacteriological sampling conducted in Lake Henry found fecal coliform levels consistently about 400 colonies/100ml, the state water quality standard for body contact recreational use.

Lake Henry is shallow, eutrophic and experiences considerable sedimentation from the upper Trempealeau River watershed. In 1979, a 17-acre portion of the lake was dredged to a depth of 10 feet. Since the dredging project, lake volume has decreased approximately 40 percent and is currently filling-in at a rate of about 10,000 cubic feet per year (DNR, 1991).

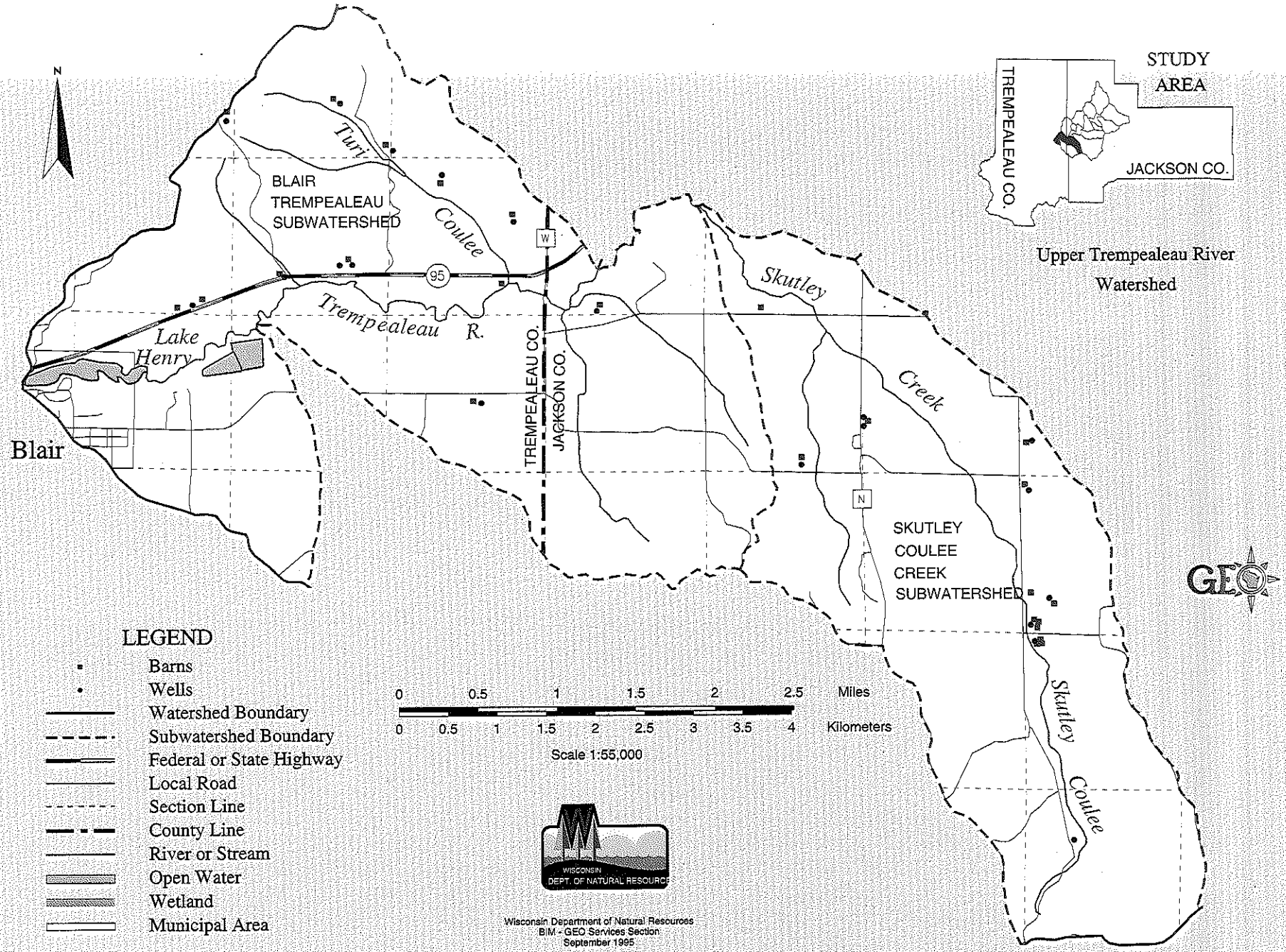
North Branch (NB)

Most of the stream corridor is currently in a DNR Fishery Area, and there have been several Department easements and acquisitions. Livestock have been excluded from about 90% of the stream corridor and habitat improvements have been completed on 11 stream miles.

Trump Coulee (TR)

This stream is limited by elevated water temperatures, organic loading, sedimentation and lack of suitable cover for trout. Monitoring conducted in 1992 found dissolved oxygen conditions during a 1.13 inch rainfall event on September 14th below the state water quality standard of 5.0 mg.l for fish and aquatic life. A barnyard located near the stream may be a significant source of organic loading.

Map 3- 1. Blair - Trempealeau and Skutley Coulee Creek Subwatersheds



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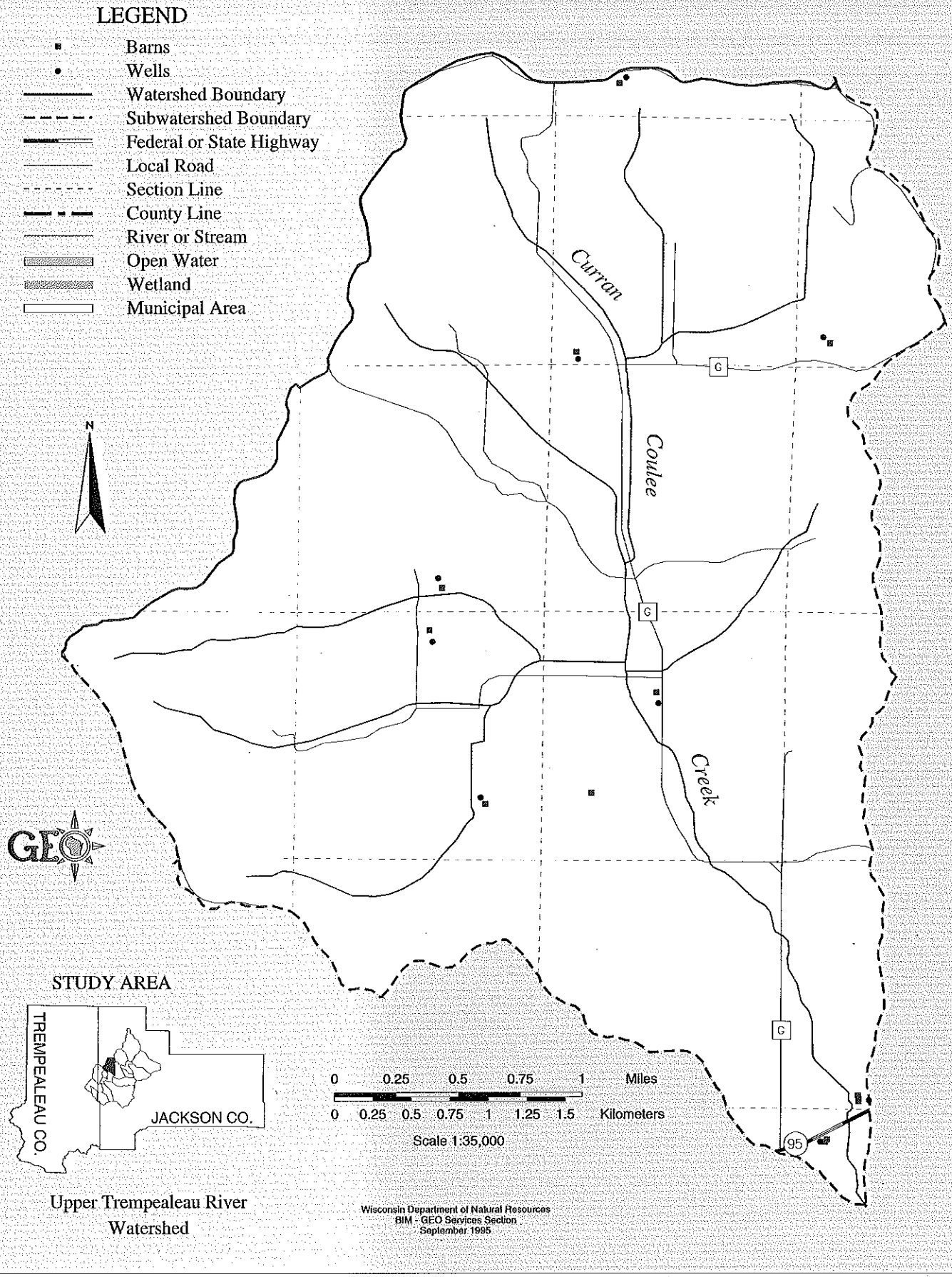
Map 3- 2. Curran Coulee Creek Subwatershed



Upper Trempealeau River Watershed

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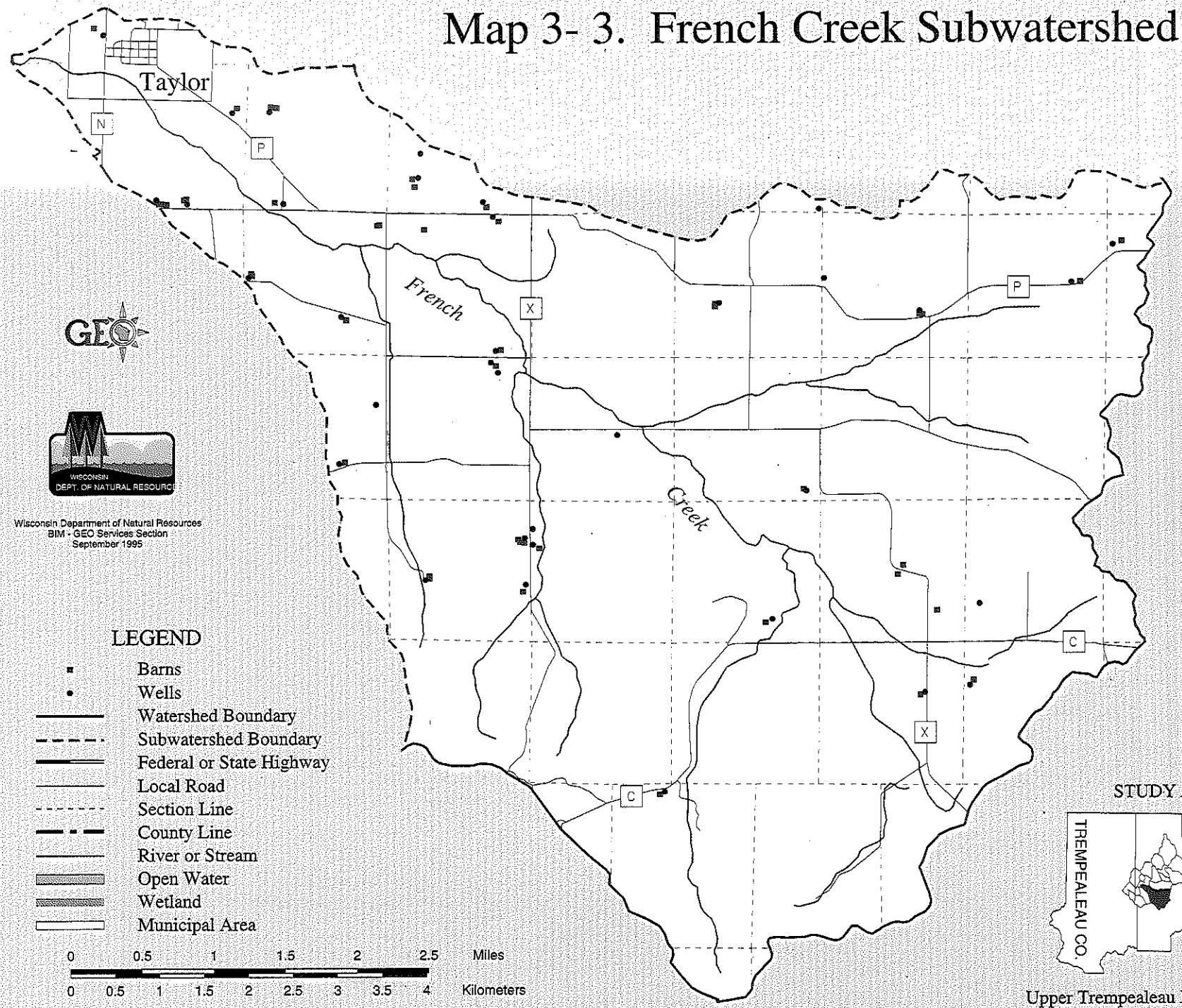
Map 3- 3. French Creek Subwatershed



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September 1995

N

LEGEND

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

0 0.5 1 1.5 2 2.5 Miles

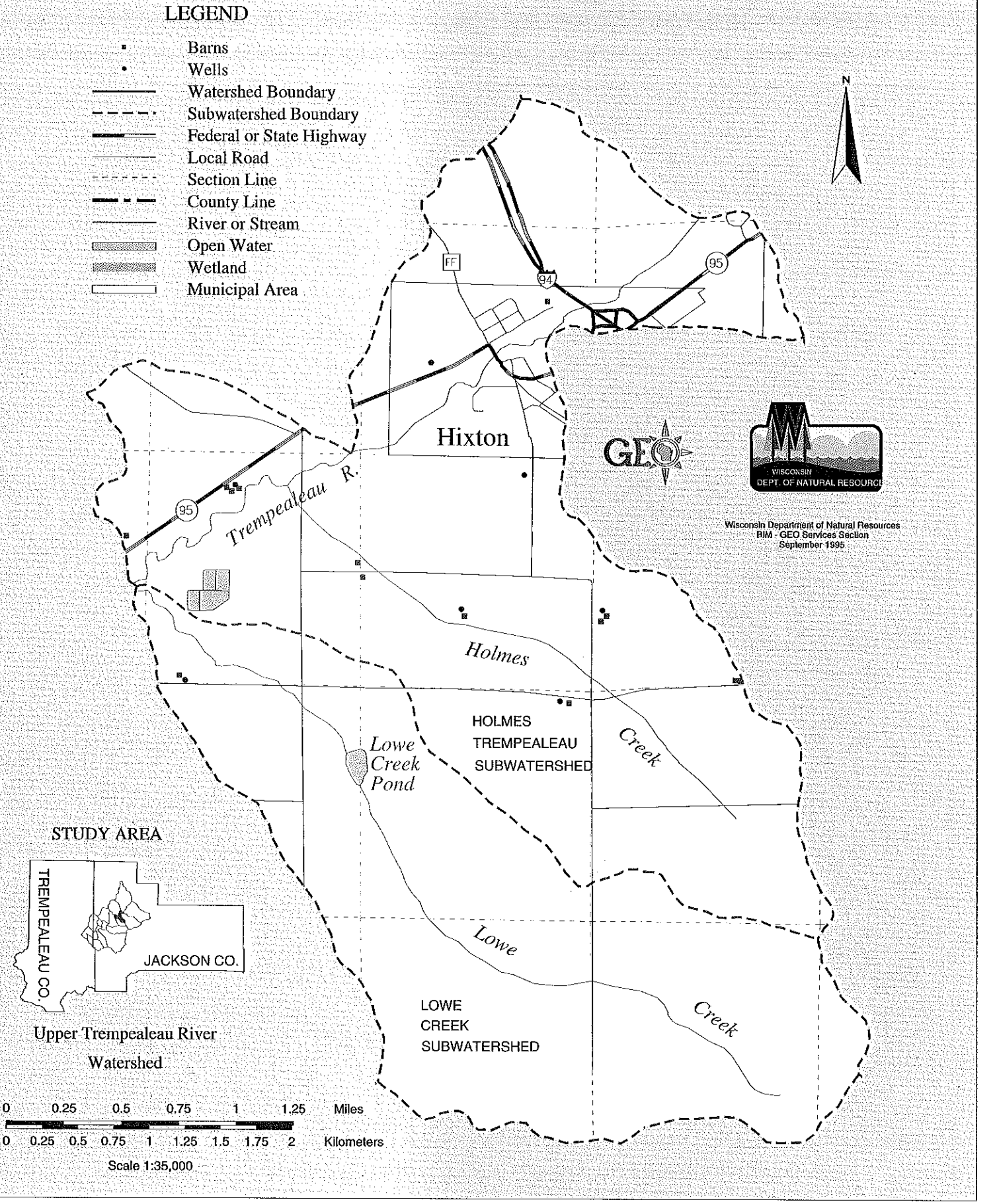
0 0.5 1 1.5 2 2.5 3 3.5 4 Kilometers

Scale 1:60,000

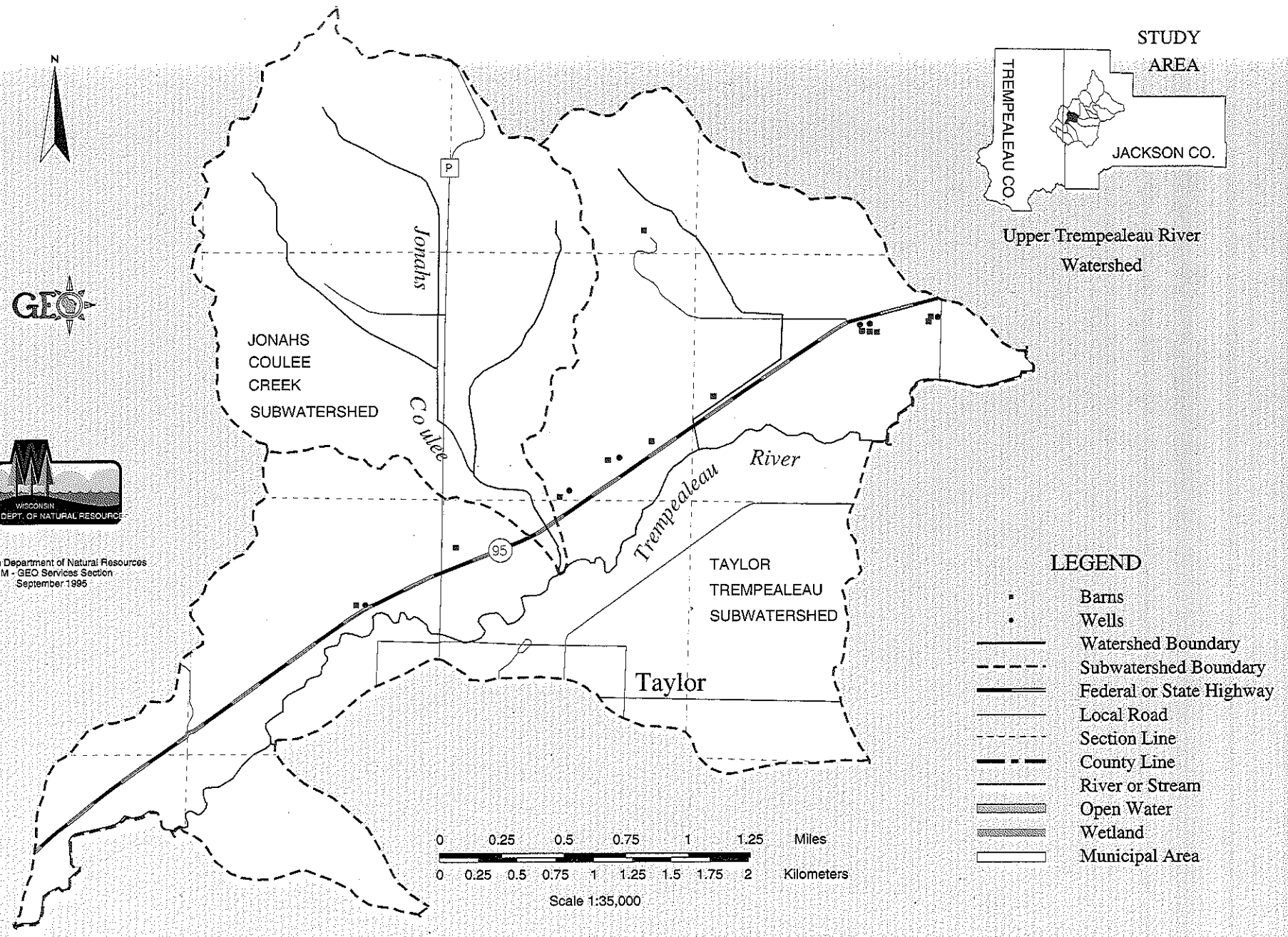
STUDY AREA

Upper Trempealeau River Watershed

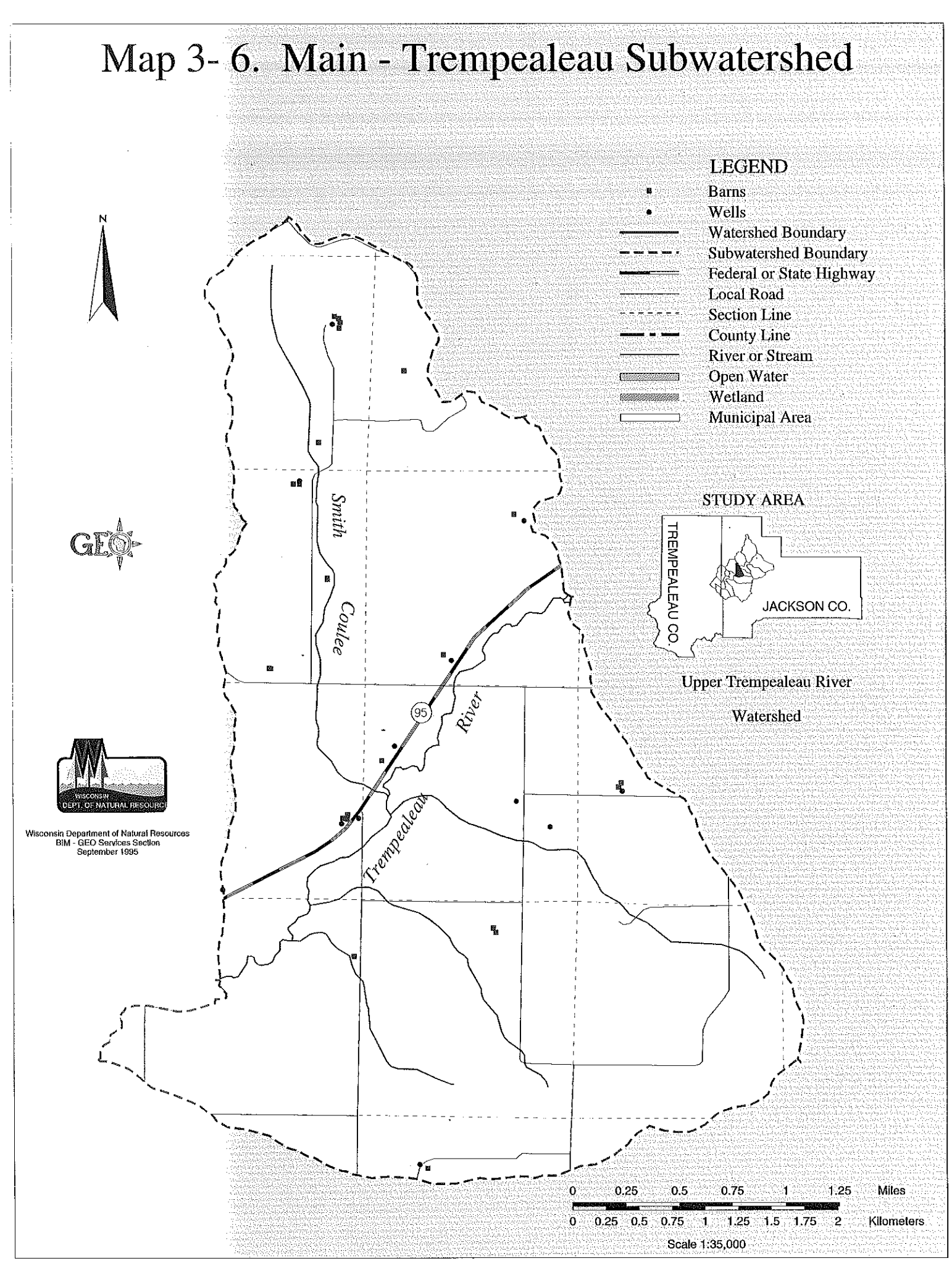
Map 3- 4.
Holmes - Trempealeau and Lowe Creek Subwatersheds



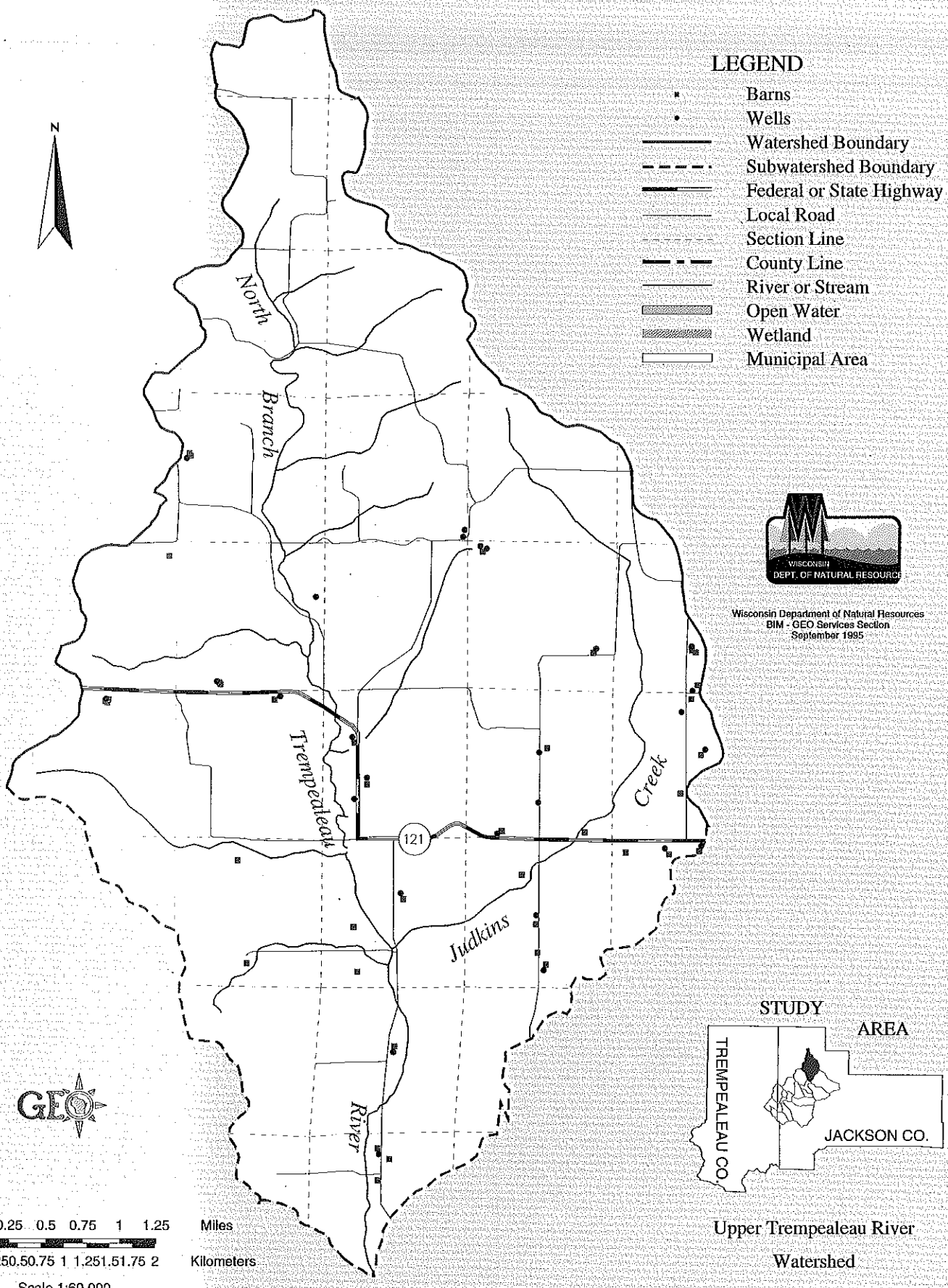
Map 3- 5. Jonahs Coulee Creek and Taylor - Trempealeau Subwatersheds



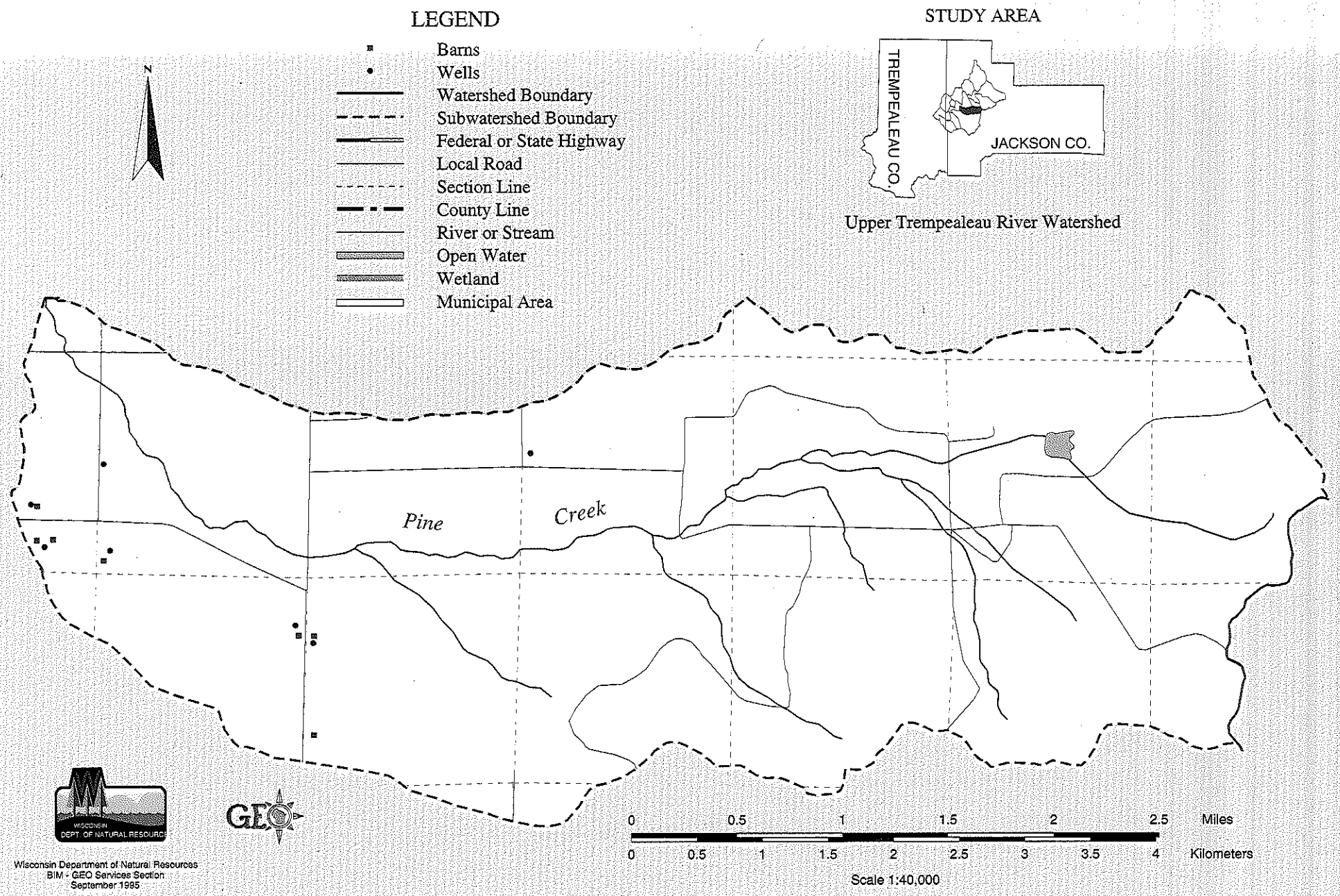
Map 3- 6. Main - Trempealeau Subwatershed



Map 3- 7. North Branch Trempealeau River Subwatershed



Map 3- 8. Pine Creek Subwatershed



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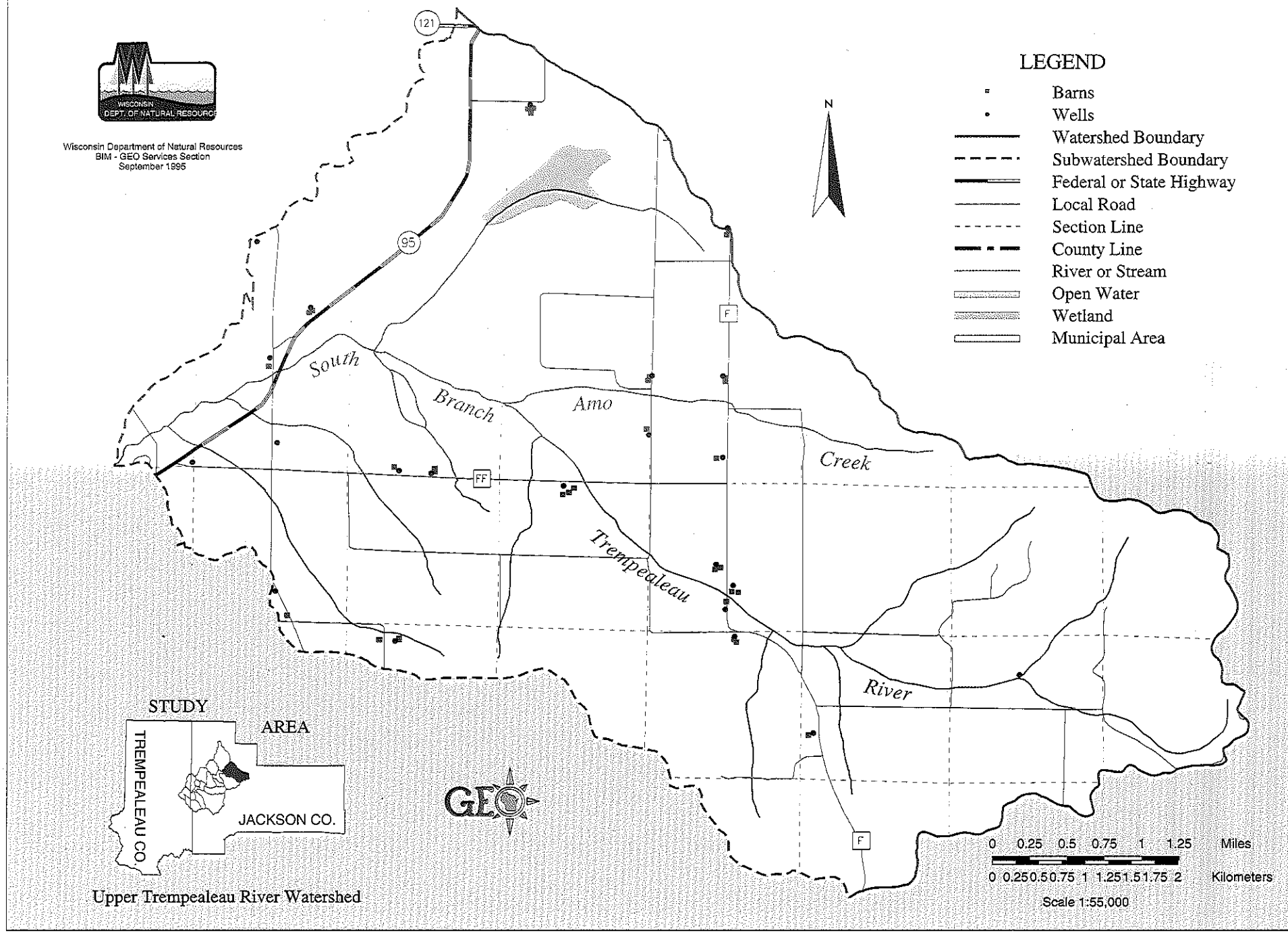
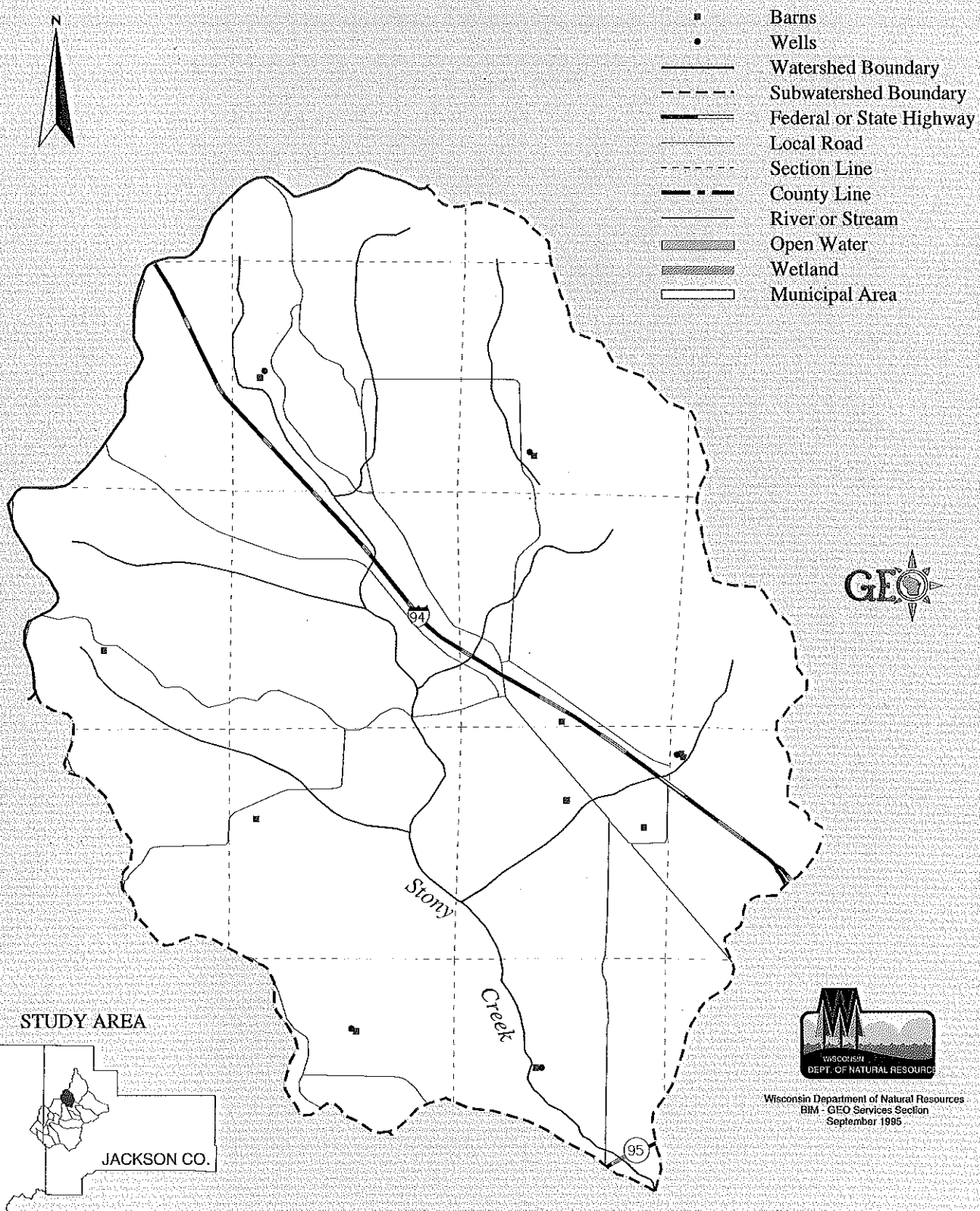
Map 3- 9. South Branch Trempealeau River Subwatershed



Map 3- 10. Stony Creek Subwatershed



Upper Trempealeau River Watershed

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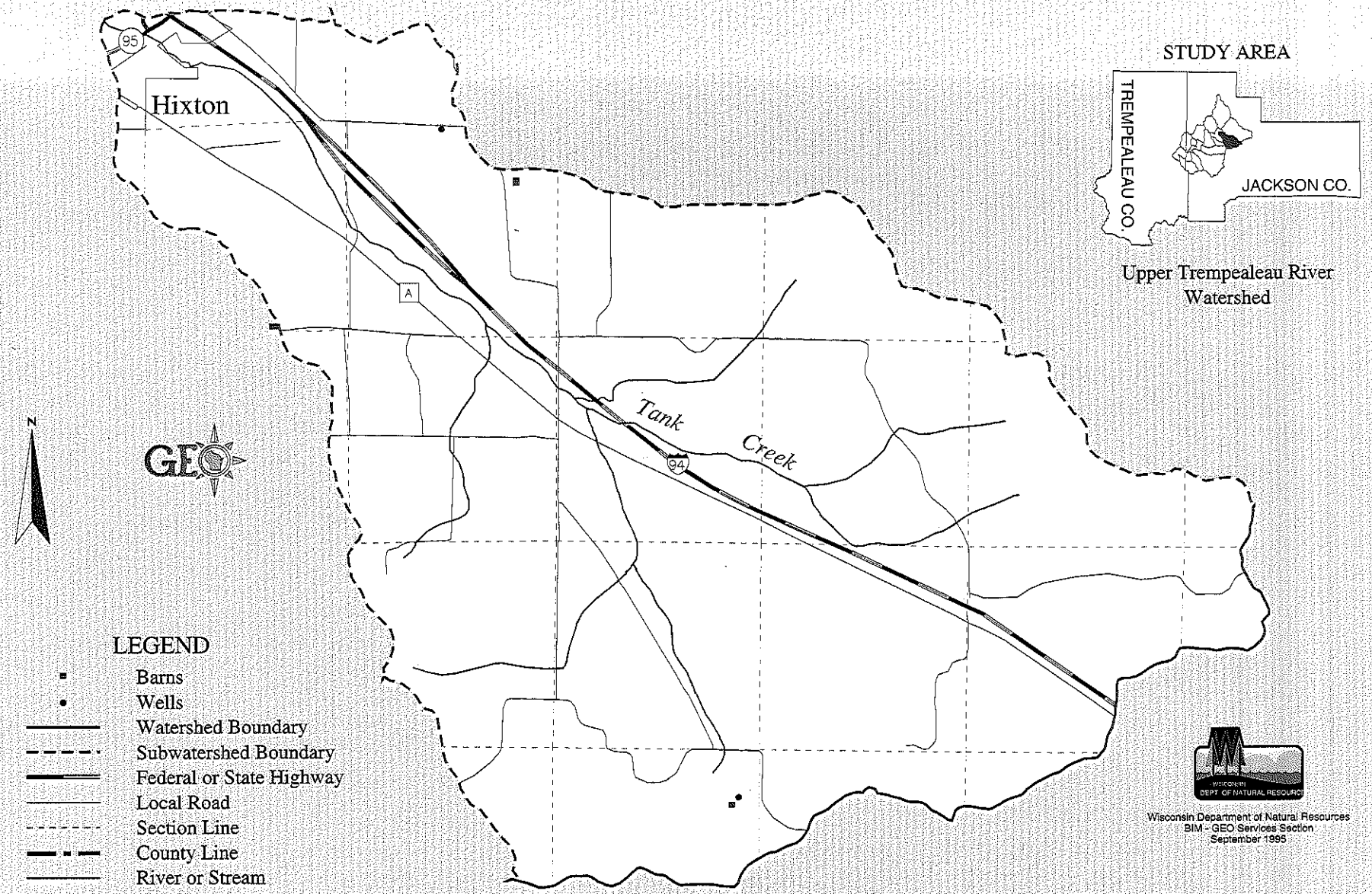
Map 3- 11. Tank Creek Subwatershed

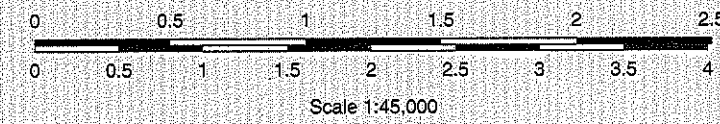


STUDY AREA

Upper Trempealeau River Watershed

LEGEND

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



Scale 1:45,000

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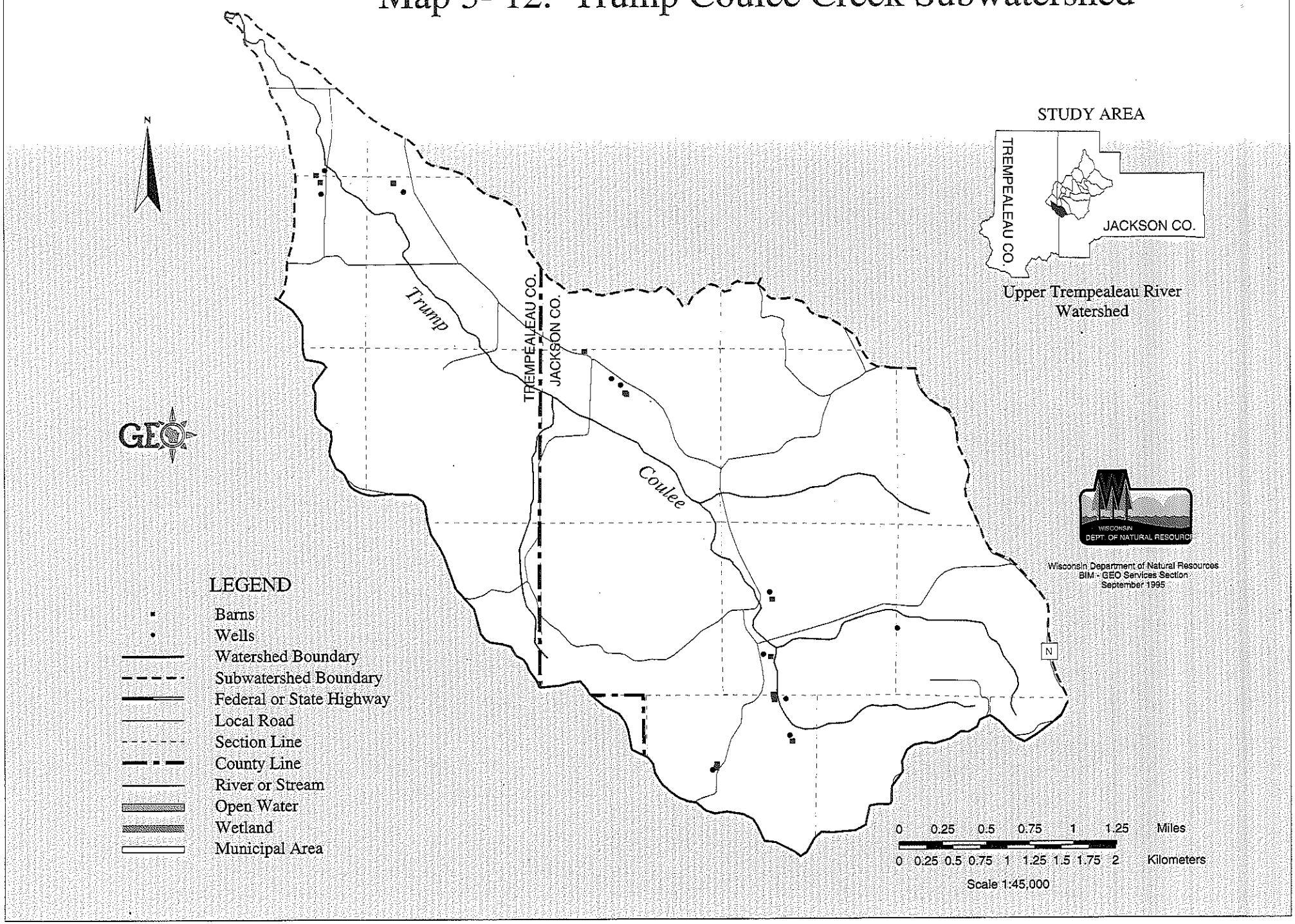
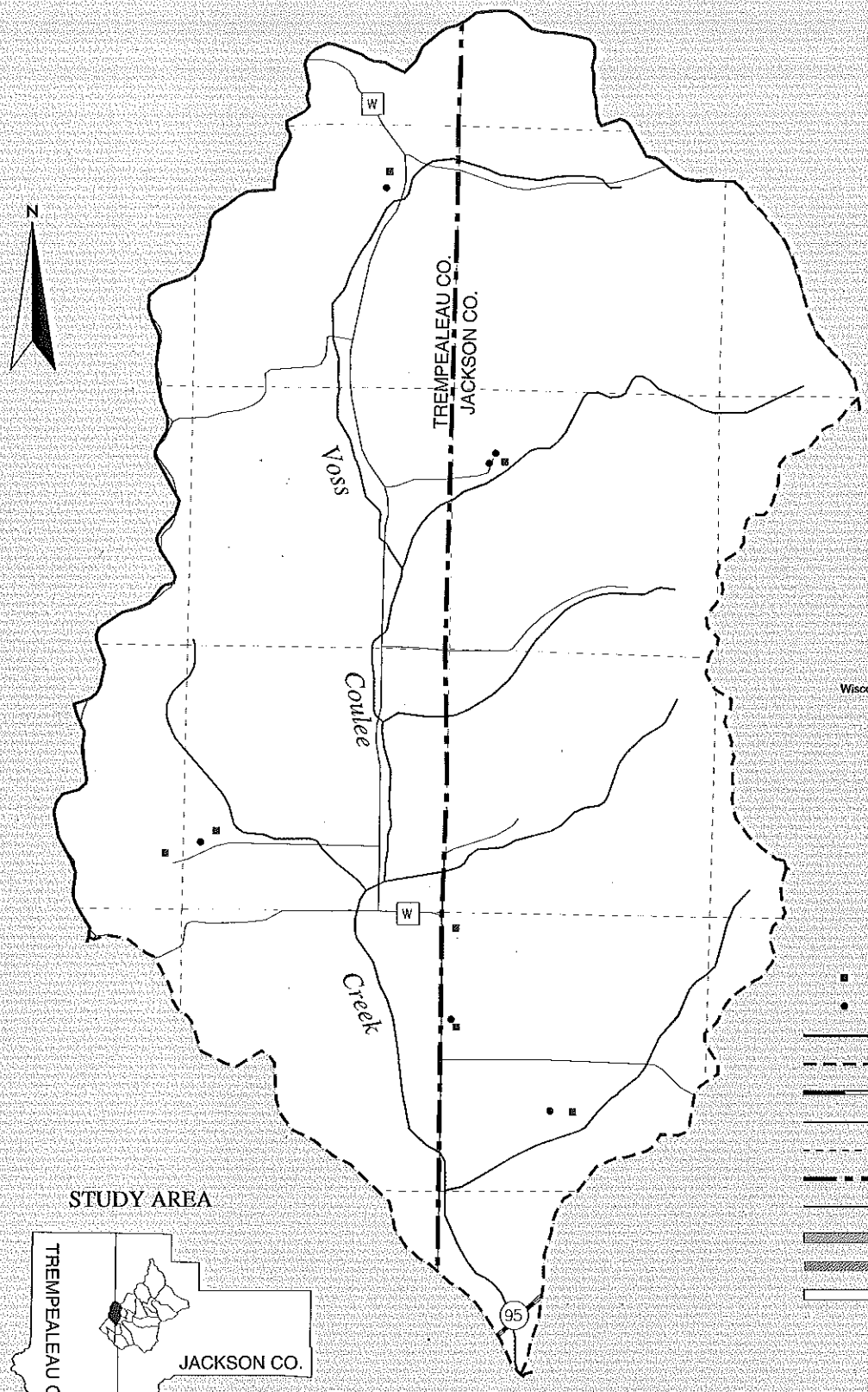
Map 3- 12. Trump Coulee Creek Subwatershed



Map 3- 13. Voss Coulee Creek Subwatershed



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LEGEND

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

STUDY AREA

Upper Trempealeau River Watershed

0 0.25 0.5 0.75 1 1.25 Miles

0 0.25 0.5 0.75 1 1.25 1.5 1.75 2 Kilometers

Scale 1:40,000

A DNR fish rearing pond is located on an unnamed, intermittent tributary in the headwater area of Trump Coulee Creek. This facility is used to raise various gamefish fingerlings, including muskellunge, walleye and largemouth bass. Water in the pond is typically managed by slowly releasing water in late fall after fish are harvested, then closing the dam gates to allow the pond to fill with spring runoff. The only pond discharge during the summer is bottom leakage through the dam stop logs.

Monitoring conducted during summer 1993 found mean water temperatures in the unnamed tributary elevated about 5 degrees Celsius by the rearing pond, but temperatures in Trump Coulee Creek were not impacted. Seepage from the rearing pond is a small proportion of the total streamflow in Trump Coulee Creek during summer.

Water Resource Objectives

Water Resource Objectives are listed in table 3-1.

Results of Nonpoint Source Inventories

Barnyard Runoff

Runoff carrying a variety of pollutants from barnyards and other livestock feeding, loafing, and pasturing areas is a significant source of pollutants in the streams of the Upper Trempealeau River Watershed. Livestock operations comprised of 256 animal lots are a source of 7,508 pounds of phosphorus, per year (table 3-2). Most of the oxygen-demanding pollutants and nutrients associated with these operations drain via concentrated flow to creeks and wetlands.

Table 3-2. Barnyard Inventory Results: Upper Trempealeau River Watershed

Subwatershed	Number of Barnyards	Total Phosphorous* (lbs)	Percent Watershed P Load
Blair Trempealeau-Jackson County	12	874	12
Blair Trempealeau-Trempealeau County	1	63	1
Curran Creek	14	246	3
French Creek	41	716	10
Holmes Trempealeau	6	65	1
Jonah's Coulee Creek	1	3	0
Lowe Creek	4	27	0

Subwatershed	Number of Barnyards	Total Phosphorous* (lbs)	Percent Watershed P Load
Main Trempealeau	37	604	8
North Branch Trempealeau	39	1,179	16
Pine Creek	9	112	2
South Branch Trempealeau	34	1,494	20
Skutley Creek	15	402	5
Stony Creek	14	412	6
Tank Creek	6	75	1
Trump Coulee Creek Jackson County	11	537	7
Trump Coulee Creek-Trempealeau County	3	568	8
Taylor Trempealeau	1	31	0
Vosse Coulee Creek-Jackson County	4	16	0
Vosse Coulee Creek-Trempealeau County	4	87	1
Totals	256	7,508	100

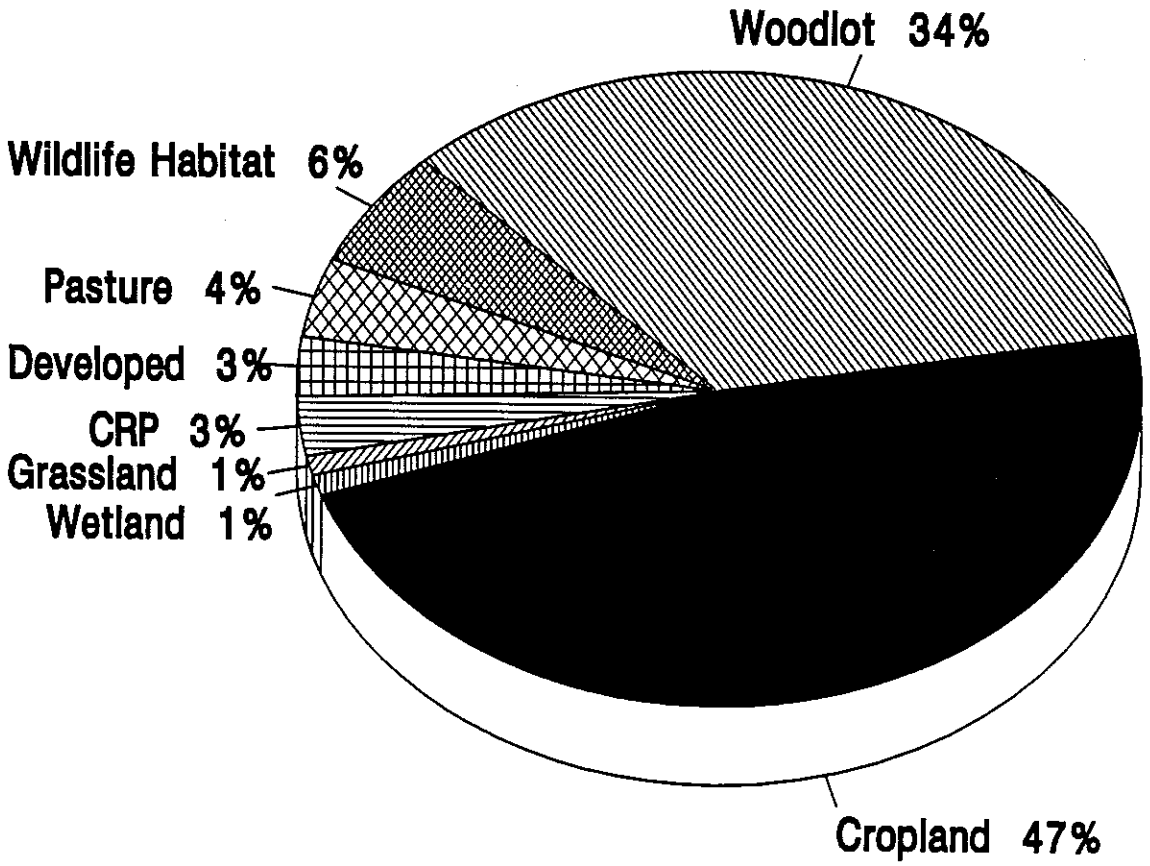
* Based on Annual Phosphorus Loads
Sources: Jackson and Trempealeau County Land Conservation Departments, DNR and DATCP

Upland Sediment

Intensive agricultural practices have caused considerable amounts of eroded soil to reach streams, ponds, and wetlands in the Upper Trempealeau River Watershed. Upland erosion is the major source of the sediments that are carried downstream, beyond individual subwatershed boundaries.

Upland sediment sources were evaluated through subarea sampling and extrapolation for the entire 112,338 acre watershed. The results of this inventory are summarized in table 3. An estimated 5,848 tons of soil per year are delivered to wetlands or streams in the watershed from croplands. Uplands are the source of 70% percent of the sediment delivered to surface waters. Figure 3-1 summarizes upland sediment loading by land use for all subwatersheds.

Figure 3-1. Summary of Upland Sediment Loading by Landuse: All Subwatersheds



Source: DNR

Table 3-3. Summary of Upland Sediment Loading By Land Use: Upper Trempealeau River Watershed

Subwatershed		Cropland	Cropped Alter-native[1]	Developed	Grassland	Pasture	Gr. Woodlot	Woodlot	Wetland	Farmstead	Hayland	Totals
Blair Tremp.	Acres	1725	0	505	0	0	0	3623	3673	0	0	6305
	Sediment	42	0	3	0	0	0	5	1	0	0	51
Curran Creek	Acres	1627	0	70	0	47	1043	2614	606	124	166	6297
	Sediment	101			0	0	5	4	2	1	0	113
French Creek	Acres	8318	0	90	0	651	203	6370	1830	260	0	17722
	Sediment	574	0	1	0	3	1	8	4	3	0	594
Holmes Tremp.	Acres	2385	0	30	0	188	120	345	204	24	208.9	45937
	Sediment	622	0		0	116.6	53.4	102.0		0	0	29778
Jonah's Creek	Acres	777	0	25	0	0	0	630	30	0	0	1462
	Sediment	26	0		0	0	0	3	0	.0	0	29
Lowe Creek	Acres	491	0	30	0	22	26	1517	0	10	28	2124
	Sediment	9	0	0	0	0	0	6	0	0	0	15
Main Tremp.	Acres	3097	0	680	0	87	0	778	429	95	0	5166
	Sediment	487	0	7	0	0	0	1	1	1	0	497
North Branch Tremp.	Acres	1010	0	190	0	483	59	2021	667	220	27	13769
	Sediment	1926	0	2	0	2	1	0	1	2	0	1935
Pine Creek	Acres	3453	0	80	0	496	196	2326	346	148	0	7045
	Sediment	280	0	1	0	2	3	1	0	2	0	289
South Branch Tremp.	Acres	7337	540	260	0	176	216	498	1107	186	319	14214
	Sediment	540	27	2	0	1	0	2	2	2	1	577
Skutley Creek	Acres	1301	0	90	0	229	325	1754	654	64	0	4417
	Sediment	121	0	1	0	1	6	6	1	0	0	1310
Stony Creek	Acres	4024	0	105	0	600	0	1521	94	91	0	6435
	Sediment	522	0	1	0	3	0	6	0	0	0	532

Subwatershed		Cropland	Cropped Alter-native[1]	Developed	Grassland	Pasture	Gr. Woodlot	Woodlot	Wetland	Farmstead	Hayland	Totals
Tank Creek	Acres	2169	0	310	0	0	0	5396	199	31	104	8209
	Sediment	78	0	3	0	0	0	4	0	0	0	85
Trump Coulee Creek-Jackson	Acres	1761	798	100	0	696	82	3030	0	48	19	6534
	Sediment	58	148	0	0	3	2	2	0	0	0	223
Taylor Tremp.	Acres	1797	215	425	6	188	109	213	169	62	17	3195
	Sediment	125	40	4	0	1	3	0	0	0	0	173
Vosse Coulee Creek	Acres	2607	0	40	0	635	495	1986	274	97	0	6134
	Sediment	337	0	0	0	3	19	9	0	0	0	368
Totals	Acres	52966	15613	3030	0	4498	2874	38212	7011	1460	694	12338
	Sediment	5848	215	25	0	20	41	68	13	11	1	6242

Sources: Jackson and Trempealeau County LCDs, DNR.

* Sediment is reported in tons/year.
** Data was extrapolated from subarea sampling.
n.a Not additive.
[1] Cropland planned by NRCS "alternative" systems.

Table 3-4. Sediment Loadings

Subwatershed	Upland Inventories	Stream bank	Gullies	% Upland	% Stream-bank	% Gully	Total Sediment by Subwatershed
Blair Tremp.	51	140	239	12	32	56	430
Curran Creek	113	141	0	44	56	0	254
French Creek	594	407	80	55	38	7	1081
Holmes Tremp.	625	18	0	97	3	0	643
Jonah's Creek	29	21	0	58	42	0	50
Lowe Creek	15	3	0	83	17	0	18
Main Tremp.	497	517	0	49	51	0	1014
North Branch Tremp.	1935	115	46	93	5	2	2096
Pine Creek	289	68	10	79	19	2	367
South Branch Tremp.	577	85	107	75	11	14	769
Skutley Creek	136	197	60	35	50	15	393
Stony Creek	532	27	33	90	5	5	592
Tank Creek	85	2	0	98	2	0	87
Trump Coulee Creek-Jackson	223	145	9	59	39	2	377
Taylor Tremp.	173	90	3	65	34	1	266
Vosse Coulee Creek	368	141	1	72	28	0	510
Total Sediment	6242	2117	588	70%	24%	6%	8947 T/yr

Streambank Erosion

Streambank erosion contributes 24 percent of the total sediment to surface waters in the Upper Trempealeau River Watershed. Approximately 113.9 miles of streams were evaluated. Significant erosion has occurred and/or aquatic habitat and water quality were degraded along approximately 11.6 miles of streambank. An estimated 2117 tons of sediment are eroding into streams annually. See table 3-5 for streambank inventory results.
Manure spread on frozen or saturated ground is a significant water quality problem in this watershed. The water quality concern happens in the spring when manure has not been incorporated into the soil, surface water runoff is high, and manure is carried to lakes and streams. Although the amount of phosphorus and organic runoff in the spring cannot be easily predicted, it is assumed to be a significant pollutant.

The percentage of the manure, and hence phosphorus and organic load, spread in the winter that reaches surface waters is unclear. Scientific opinion ranges from 25% to 75% delivery rate. As a rough estimate, phosphorus and organic loading from winterspread manure is usually thought to be at least as great as from barnyards or uplands. Landowners are strongly encouraged to follow a nutrient management plan, and all livestock owners are eligible for cost-sharing to have a nutrient management plan written.

See figure 3-2 for summary of nonpoint sources of sediment in the Upper Trempealeau River Watershed.

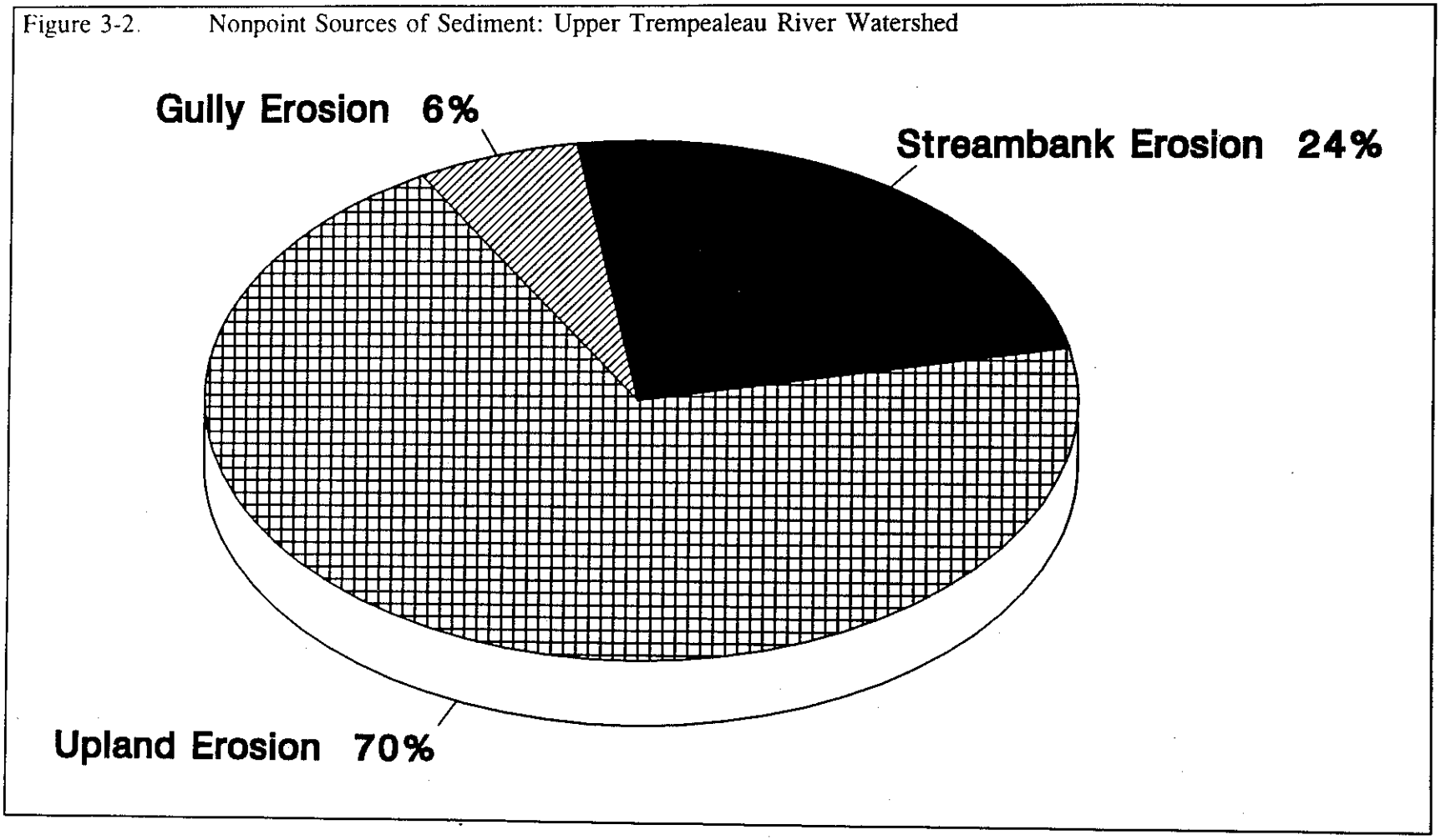
Table 3-5. Streambank Inventory Results: Upper Trempealeau River Watershed Streambank Erosion and Habitat Degraded

Subwatershed	Inventoried Streambank Length (feet)	Eroded Sites (feet)	Trampled Sites (feet)	Slumped Sites (feet)	Cattle Access (feet)	Total Sediment Loss Tons/Year	% Bank Degraded From E,T,S	% of Total Bank Erosion in Watershed	Subshed Rank for Bank Erosion	Subshed Rank for Cattle Access
Blair Trempealeau Jackson County	12672	2820	0	50	00	95.21	22.6	5.4	6	19
Blair Trempealeau Trempealeau County	58080	2640	925	36	1448	40.0	6.2	95.1	13	14
Curran Creek	52800	2480	35	0	14030	141.46	4.76	4.8	4	2
French Creek	164736	9451	260	0	3520	407.40	5.89	18.1	2	8
Holmes Trempealeau	50688	1390	4180	0	5570	43.34	10.99	2.7	12	5
Jonah's Creek	24288	625	45	00	525	20.65	2.76	1.2	17	17
Lowe Creek	28512	370	0	0	1520	3.39	1.30	.7	18	11
Main Trempealeau	60720	5947	770	0	8985	517.22	11.1	11.4	1	3
North Branch Trempealeau	179520	2790	375	0	1500	115.26	1.77	5.4	5	13
Pine Creek	58080	330	100	0	1030	68.09	.57	.6	10	15
South Branch Trempealeau	116160	1390	0	30	2090	84.51	1.23	2.7	9	10
Skutley Creek	63360	4828	1025	0	5110	197.05	2.71	9.3	3	7
Stony Creek	52800	709	0	0	7360	26.70	1.34	1.3	16	4
Tank Creek	52800	350	0	0	25	1.63	.67	.7	19	18
Trump Coulee Creek Jackson County	29568	735	142	0	14692	33.12	3.0	1.4	15	1
Trump Coulee Creek Trempealeau County	54912	4320	280	100	2520	86.31	8.6	8.3	8	9

Subwatershed	Inventoried Streambank Length (feet)	Eroded Sites (feet)	Trampled Sites (feet)	Slumped Sites (feet)	Cattle Access (feet)	Total Sediment Loss Tons/Year	% Bank Degraded From E,T,S	% of Total Bank Erosion in Watershed	Subshed Rank for Bank Erosion	Subshed Rank for Cattle Access
Blair Trempealeau Jackson County	12672	2820	0	50	00	95.21	22.6	5.4	6	19
Taylor Trempealeau	42210	2330	50	0	5210	90.49	5.64	4.5	7	6
Vosse Coulee Creek Jackson County	15840	2050	20	0	650	45.09	13.07	3.9	11	16
Vosse Coulee Creek Trempealeau County	85536	6530	410	90	1510	39.71	8.2	12.5	14	12
Totals	1203282	52085	8617	306	77295	2056.63	5.1	100%		

Source: Jackson and Trempealeau County Land Conservation Departments

Figure 3-2. Nonpoint Sources of Sediment: Upper Trempealeau River Watershed



Pollutant Reduction Goals

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

Sediment Goal: Reduce overall sediment delivered by 38 percent to meet this goal, the following is needed:

- ★ Thirty-nine percent reduction in sediment reaching streams from agricultural uplands in all subwatersheds.
- ★ Forty percent reduction in streambank sediment delivered to all streams and a 40 percent overall repair of streambank habitat in all subwatersheds.

Organic Loading Goal: Reduce overall phosphorus and organic load by 69 percent to meet this goal, the following is needed:

- ★ Sixty-nine percent reduction in organic pollutants from barnyards in all subwatersheds.
- ★ A reduction in organic pollutants from winterspread manure on "unsuitable" acres in all subwatersheds.

Note: These goals assume 100% landowner participation, and that all of Category I and half of Category II sources are controlled. The only exception to this is the upland sediment model, which assumes 50% participation.

Other Pollution Sources

This section describes pollution sources that have an impact on water quality in the Upper Trempealeau River Watershed, but which are beyond the scope of this project. Control of these pollution sources occurs through other state and county regulatory programs, as described below.

Municipal and Industrial Point Sources of Pollution

Discharges of wastewater from permitted municipal and industrial sources are important considerations for improving and protecting surface water resources. The villages of Hixton and Taylor have municipal wastewater treatment plants that discharge to surface water. Chapter 147, Wis. Stats., requires any person discharging pollutants into the waters of the state to obtain a Wisconsin Discharge Elimination System (WPDES) Permit.

Village of Hixton Wastewater Treatment Plant

The village of Hixton WWTP discharges to groundwater. Treatment of wastewater is through a stabilization pond and absorption pond system. The system is presently operating at 50% of its design capacity.

Village of Taylor Wastewater Treatment Plant

The village of Taylor WWTP discharges to surface water.

Wisconsin Dairies Coop Wastewater Treatment Plant

The Wisconsin Dairies Coop WWTP discharges to surface water in the South Branch subwatershed.

Wisconsin Dairies Cooperative operates a wastewater treatment system that discharges to groundwater along South Branch. Past and recent Department studies have found adequate dissolved oxygen levels in the stream to protect aquatic life. However, the discharge appears to be causing elevated dissolved iron concentrations below the treatment system. The ecological significance of the iron deposits has not been determined.

Badger Silica Mine Wastewater Treatment Plant

Badger Silica Mine WWTP discharges to surface water in Jonah Coulee Creek and Vosse Coulee subwatershed. Badger Mining is a Company that produces silica sand near Taylor, Wisconsin. The mine is an open pit operation and is extensive in its land disturbing activities. In 1982, some complaints were received by the DNR concerning sedimentation in nearby streams that apparently was caused by uncontrolled soil erosion at the mine. In 1990, the Department received more complaints of a similar nature and then proceeded to collect information on water quality and the impact the area had on nearby waters. The suspected sources of sediment observed in the streams were water control structures, reclamation piles and parking areas at the mine. Documentation of the problem was completed in 1992 and at that time, Badger Mining installed a system of erosion control structures. DNR inspection in 1993 found the control structures to be working and the loss of sediment has been greatly reduced. The Company appears to have a long term commitment to controlling erosion and sediment loading from this source should remain minimal.

Sand Distribution Operation in Stony Creek Subwatershed

A trucking business is located northeast of the intersection of Stony Creek and State Highway 95 just west of Hixton. The trucking business stockpiles lime, sand, gravel and other

materials on the east bank of Stony Creek. During flood events these materials may be delivered to Stony Creek. Water resource problems include sedimentation of riffles and pools from these runoff materials.

Refer to the Buffalo-Trempealeau River Areawide Water Quality Management Plan for additional details on municipal and industrial pollution sources.

Failing Septic Systems

Septic systems consist of a septic tank and a soil absorption field. Septic systems fail due to soil type, location of system, poor design or maintenance. Generally, in the Upper Trempealeau River Watershed, the majority of soils are not suitable for conventional septic tank soil absorption systems. The soils of this watershed do not accept enough moisture for an effective absorption system due to the high groundwater table. As a result, throughout the watershed there are many surface discharge systems where soil absorption systems have failed. This presents a surface water quality problem. Landspreading of septage waste during the winter months can also create surface water quality problems. Pollutants from septic system discharges are nitrates, bacteria, viruses and hazardous materials from household products.

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

Superfund Sites

There are no known superfund sites in the Upper Trempealeau watershed.

Solid Waste Disposal Sites

Village of Hixton Landfill

According to DNR files, the village of Hixton has two closed landfills. There are no active landfill sites in the Upper Trempealeau River Watershed.

Petroleum Storage: Leaking Underground Storage Tank (LUST) Sites

The Wisconsin Remedial Response Site Evaluation Report (PUBL-SW-144-91) lists the sites identified through the LUST program. The sites are listed under table 3-5 with locations, project status, and substances found.

Table 3-6. Leaking Underground Storage Tanks (April, 1992)

Site Name	Location	Status	Substance
Sechlerville Gas Contam	Sechlerville	Remedial Action	Other
Nelson Farm	Taylor	Unknown	Unknown hydrocarbons

Remedial Action - Cleanup in progress.
No Action - No action taken yet.
Investigation - Field investigation of source and extent of contamination.
Unknown - No status report at time of printing.

Other Contaminated Sites

The Wisconsin Remedial Response Site Evaluation Report also has the Inventory of Sites or Facilities Which May Cause or Threaten to Cause Environmental Pollution and the Spills Program List which includes sites or facilities identified under the Hazardous Substance Spill Law. See table 3-7 for list of spill sites (six sites).

Table 3-7. Spills (April, 1991)

Location	Action	Substance
Hixton	Investigation	Milk
Hixton	Investigation	Benzene
Hixton	Investigation	Gasoline
Hixton	Investigation	#2 Diesel Fuel
Hixton	Investigation	Fuel Oil
Taylor	Investigation	Fuel Oil

No Action - No on-site investigation.
Investigation - On-site assessment to confirm release, identify potential responsible parties, assess environmental harm and direct potential responsible party to take action.
Cleanup - DNR hired cleanup contractor.

Land Application of Municipal and Industrial Wastes

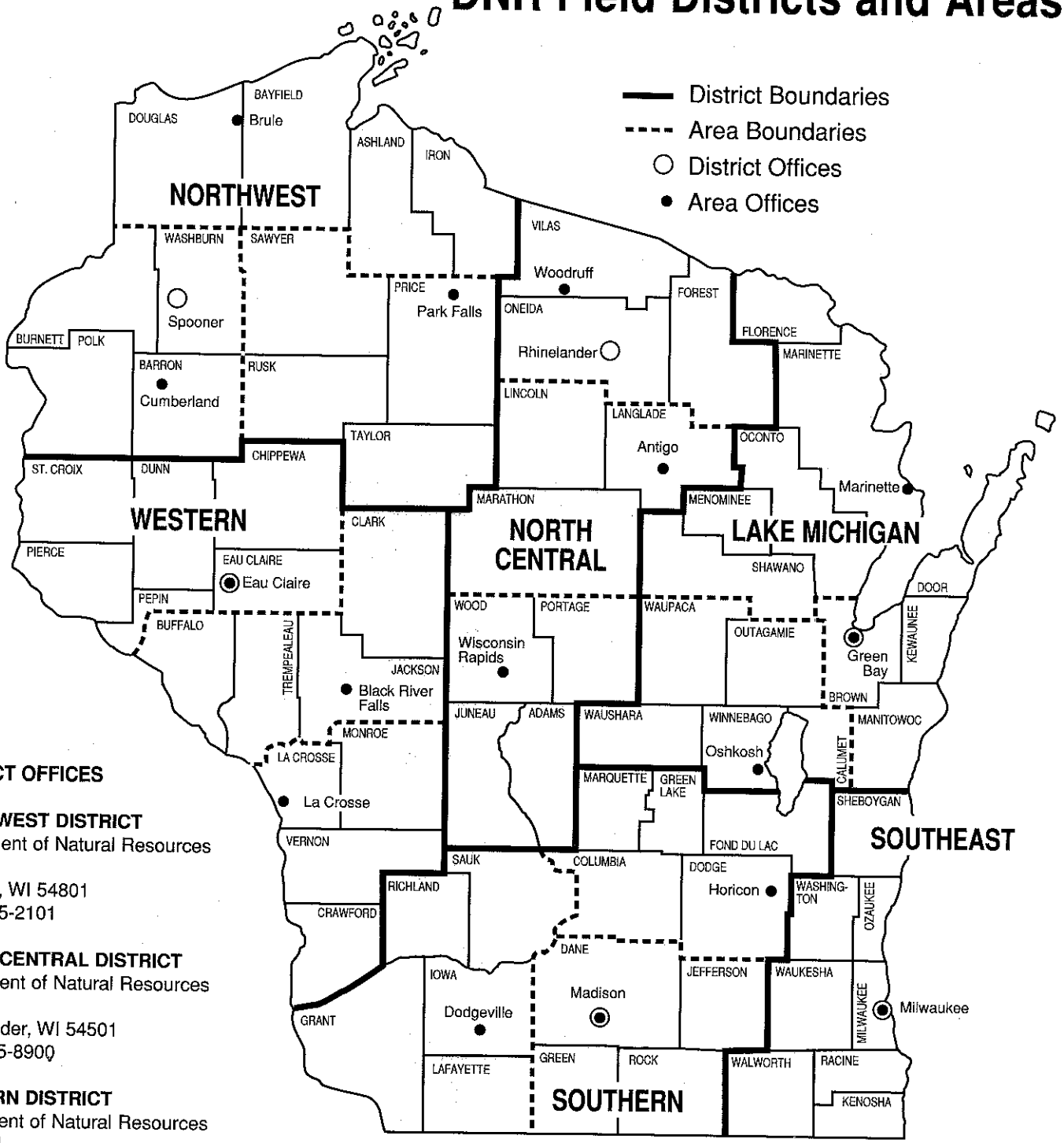
Sludge is an organic, non-sterile, by-product of treated wastewater, composed mostly of water (up to 99 percent). The re-use of sludge through land application is considered a beneficial recycling of nutrients and a valuable soil conditioner. Use of sludge in this manner is also considered to be the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

Land application of municipal and industrial sludge is regulated under NR 204 and NR 214 respectively which require a WPDES permit, site criteria, minimum distances from wells,

application rates to ensure that environmental and public health concerns such as proper soil types, depth to groundwater, distance from surface water, and the type of crop to be grown on sludge amended fields are taken into consideration when the DNR approves agricultural fields for sludge application.

Land application of whey does occur in the Upper Trempealeau watershed, with whey produced by Wisconsin Dairies Cooperative in Alma Center. Whey is a by-product of the conversion of milk to cheese. Typically, whey consists of about 93% water, 5% lactose (milk sugar) and smaller quantities of fat, protein and minerals. The major reason for separating whey for wastewater streams is its high BOD (biochemical oxygen demand) loading. Whey is high in salts, and can adversely affect crops.

DNR Field Districts and Areas



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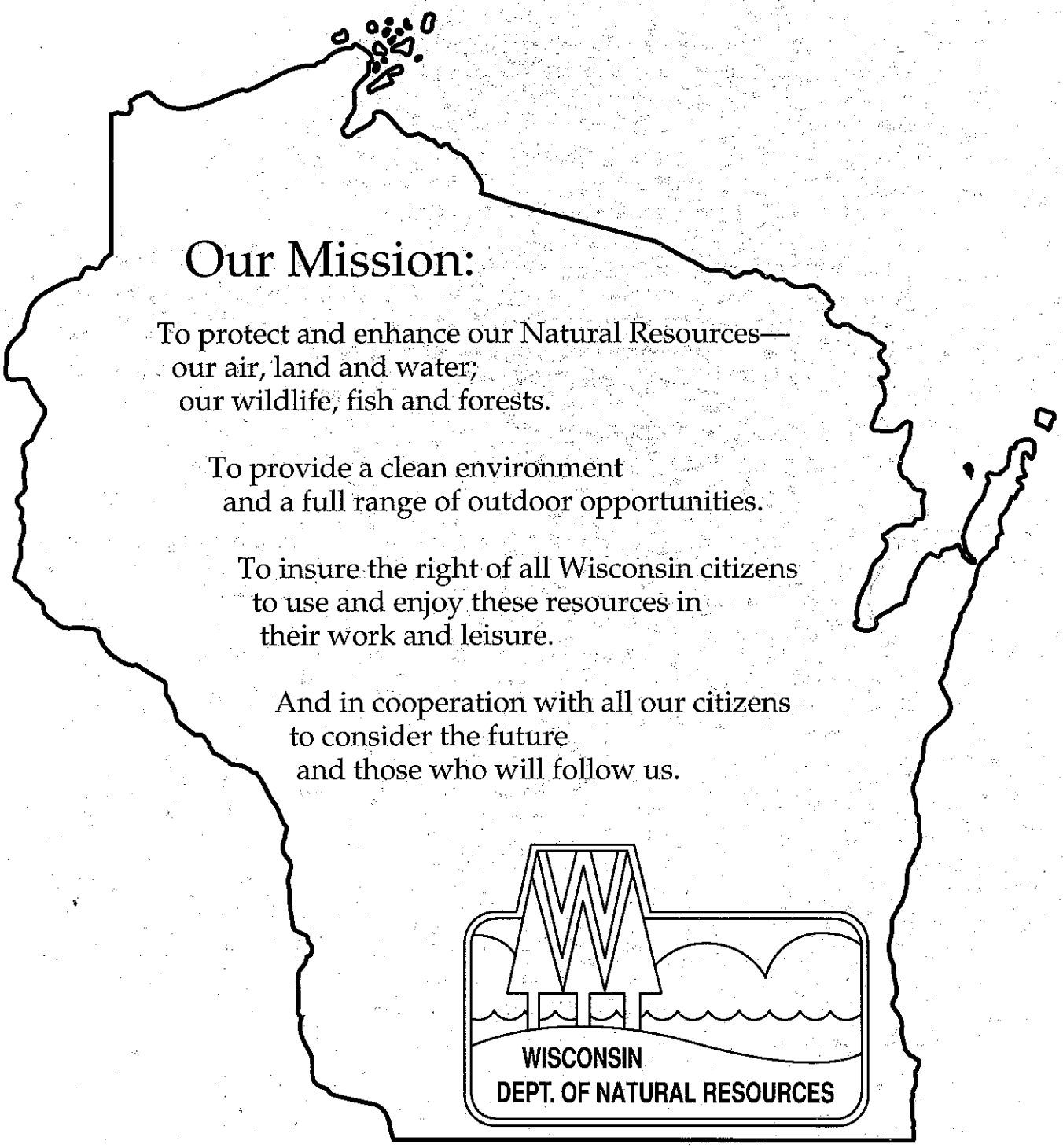

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