Nonpoint Source Control Plan for the Middle Kickapoo Priority Watershed Project

This Plan was prepared under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program by the **Wisconsin Department of Natural Resources**, the **Department of Agriculture, Trade and Consumer Protection**, and the **Land Conservation Departments** of Vernon, Monroe and Richland counties.

Nonpoint Source Control Plan for the Middle Kickapoo River Priority Watershed Project

The Wisconsin Nonpoint Source Water Pollution Abatement Program

June, 1994

This Plan Was Cooperatively Prepared By:

The Department of Natural Resources
Wisconsin Department of Agriculture Trade and Consumer Protection
In cooperation with
The Middle Kickapoo River Watershed Citizens Advisory Committee
Monroe County Department of Land Conservation
Richland County Land Conservation Department
Vernon County Land Conservation Department

Publication WR-364-94

For copies of this document please contact:

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Watershed Plan Credits

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IN REPLY REFER TO: 3200 -

June 9, 1992

Ms. Ann Greenheck
County Board Chair
Route 1
Lone Rock, WI 53556

Dear Ms. Greenheck:

This letter is to notify you that I am approving A Nonpoint Source Control Plan For The Middle Kickapoo River Priority Watershed at this time for use and implementation by Monroe and Vernon counties. This action allows your neighboring counties to begin signing cost share agreements and installing management practices for participating landowners.

My staff will continue to provide whatever assistance you need to resolve your local concerns with the watershed plan. When the Richland County Board approves the plan, I will approve implementation for your county. This action will enable you to enter into a Nonpoint Source Grant Agreement and begin signing cost share agreements with landowners. It is my hope that this approval process can be completed early this summer.

If you are in need of any additional information regarding the watershed plan or the approval process, please contact Rebecca Wallace, Chief of the Nonpoint Source and Land Management Section, at (608) 266-9254.

Sincerely,

C.D. Besadny
Secretary

cc: Dave Jelinski, Department of Agriculture, Trade, and Consumer Protection
Don Winter, DNR Western District Director
Craig Karr, DNR Bureau of Community Assistance Management

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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June 9, 1992

File Ref: 3200

Jack Robinson, Vernon County Board Chair
Courthouse
West Decker
Viroqua, Wisconsin 54665

Dear Mr. Robinson,

I am pleased to approve A Nonpoint Source Control Plan For The Middle Kickapoo River Priority Watershed. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR 120 of the Wisconsin Administrative Code.

The plan has been approved by Monroe and Vernon counties and by the Wisconsin Department of Agriculture, Trade, and Consumer Protection. We expect the Richland County Board to approve the plan later this summer. This letter completes the approval process for Vernon County set forth in Wisconsin Statutes and allows for granting of funds through the Nonpoint Source and Water Pollution Abatement Program to implement the project.

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

This plan, prepared jointly by the Department of Natural Resources, the Department of Agriculture, Trade, and Consumer Protection, and Monroe, Richland, and Vernon County Land Conservation Department staffs, is an example of the cooperative efforts that can help improve and protect the streams, rivers, and wetlands of the Middle Kickapoo River Watershed. I'm confident that the cooperative spirit shown throughout the development of this plan will continue during the implementation of this project.

Sincerely,

C.D. Besadny
Secretary

cc: Dave Jelinski, Department of Agriculture, Trade, and Consumer Protection
Don Winter, DNR Western District Director
Craig Karr, DNR Bureau Community Assistance Management

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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File Ref: 3200

June 9, 1992

Mr. Harv Simmons, Monroe County Board Chair
606 West Wisconsin
Sparta, Wisconsin 54656

Dear Mr. Simmons,

I am pleased to approve A Nonpoint Source Control Plan For The Middle Kickapoo River Priority Watershed. This plan meets the intent and conditions of s. 144.25, Wisconsin Statutes, and Chapter NR 120 of the Wisconsin Administrative Code.

The plan has been approved by Monroe and Vernon counties and by the Wisconsin Department of Agriculture, Trade, and Consumer Protection. We expect the Richland County Board to approve the plan later this summer. This letter completes the approval process for Monroe County set forth in Wisconsin Statutes and allows for granting of funds through the Nonpoint Source and Water Pollution Abatement Program to implement the project.

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

This plan, prepared jointly by the Department of Natural Resources, the Department of Agriculture, Trade, and Consumer Protection, and Monroe, Richland, and Vernon County Land Conservation Department staffs, is an example of the cooperative efforts that can help improve and protect the streams, rivers, and wetlands of the Middle Kickapoo River Watershed. I'm confident that the cooperative spirit shown throughout the development of this plan will continue during the implementation of this project.

Sincerely,

C.D. Besadny
Secretary

cc: Dave Jelinski, Department of Agriculture, Trade, and Consumer Protection
Don Winter, DNR Western District Director
Craig Karr, DNR Bureau Community Assistance Management

State of Wisconsin
Department of Agriculture, Trade & Consumer Protection

Alan T. Tracy
Secretary

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

April 23, 1992

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

Bruce

Dear ~~Mr. Baker~~:

The Department of Agriculture, Trade and Consumer Protection has received your request to approve the "Nonpoint Source Control Plan For The Middle Kickapoo River Priority Watershed Project". I hereby approve the watershed plan.

We look forward to assisting DNR and the Land Conservation Committees in Vernon and Monroe Counties in implementing the project. Richland County is reconsidering approval of the watershed plan. We will continue to work with Richland County to facilitate their enactment of an animal waste storage ordinance.

Please contact Keith Foye (273-6203) if we can be of any further assistance in moving the project to implementation.

Sincerely,

Dave Jelinski

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

cc: Becky Wallace
Jeff Hastings, Vernon County Land Conservation Department
Al Hoff, Monroe County Land Conservation Department
Charles Bolte, Richland County Land Conservation Department

RESOLUTION NO. 191-91

RESOLUTION AUTHORIZING THE ADOPTION OF THE
MIDDLE KICKAPOO RIVER PRIORITY WATERSHED PLAN

WHEREAS, the State Department of Natural Resources designated a priority watershed through the Wisconsin Nonpoint Source Pollution Abatement Program in 1989; and

WHEREAS, the staffs of the Monroe, Vernon, and Richland County Land Conservation Departments have cooperated with state and federal agencies to complete A Nonpoint Source Control Plan for the Middle Kickapoo River Priority Watershed; and

WHEREAS, the watershed plan details actions and resources needed to address water quality problems in the Middle Kickapoo River Watershed; and

WHEREAS, the watershed plan must be reviewed and approved by the county boards of Monroe, Vernon, and Richland Counties prior to receiving state cost-sharing and technical assistance funds for best management practice installation; and

WHEREAS, the Monroe County Land Conservation Committee has reviewed the Middle Kickapoo River Priority Watershed Plan on October 24, 1991 and does recommend to the Monroe County Board of Supervisors that they do adopt the Middle Kickapoo Watershed Plan of which a summary had been distributed to the members in August of 1991, by mail, and the full draft and summary is on file in the Monroe County Clerk's Office for review.

NOW, THEREFORE, BE IT RESOLVED by the Monroe County Board of Supervisors that they do hereby approve the Middle Kickapoo Watershed Plan and they do hereby authorize the implementation of the plan by the Monroe County Department of Land Conservation. Said plan is on file with the Monroe County Clerk which is incorporated herein and made a part hereof.

Dated this 13th day of November, 1991.

OFFERED BY THE LAND CONSERVATION COMMITTEE

Fiscal Note:

99% reimbursement by the state except for approximately $500 or less for certain equipment and supplies. Authorized in the 1992 budget.

Approved by:

David A. Shudlick
Corporation Counsel

STATE OF WISCONSIN } ss
COUNTY OF MONROE

I, DAVID L. HERING, County Clerk, DO HEREBY CERTIFY that the foregoing is a true and correct copy of Res. 191-91 adopted by the County Board of Supervisors at the meeting held NOV 13 1991

DAVID L. HERING, MONROE COUNTY CLERK

RESOLUTION NO. 91-120 (Amended)

A Resolution Approving The Middle Kickapoo River Priority Watershed Plan.

WHEREAS State money is available to county land conservation departments from the State of Wisconsin, Department of Natural Resources' (DNR) non-point source water pollution program for the purpose of controlling water pollution arising, in this case, from farming operations, and

WHEREAS the Land Conservation Committee has determined that it is appropriate for Richland County to engage in such a non-point water pollution control program as part of its Middle Kickapoo Watershed Project and, in order to receive 100% DNR funding, the Committee had to prepare a priority watershed plan which established priorities in terms of which types of water pollution control practices would be utilized to control which types of water pollution control problems, and

WHEREAS the Land Conservation Committee has prepared a Middle Kickapoo Priority Watershed Plan, a copy of which is attached to the original of this Resolution, and DNR's regulations require County Board approval of such a Plan before State funds can be received by the County, and the Committee is now presenting its Plan to the County Board for its approval.

NOW, THEREFORE, BE IT RESOLVED by the Richland County Board of Supervisors that approval is hereby granted to the Middle Kickapoo Priority Watershed Plan, a copy of which is attached to the original of this Resolution, which has been prepared by the Richland County Land Conservation Committee for the purpose of securing DNR non-point water pollution control funds, and

BE IT FURTHER RESOLVED that this Resolution shall be effective immediately upon its passage.

VOTE ON FOREGOING RESOLUTION

AYES 14 NOES 5

RESOLUTION Adopted

Victor V. Vlasak
COUNTY CLERK

DATED June 16, 1992

RESOLUTION OFFERED BY THE LAND CONSERVATION COMMITTEE

	FOR	AGAINST
James Lewis		
Richard Rasmussen		
Arland McKittrick		
Gerald Goplin		
Earl Mellen		

STATE OF WISCONSIN)
)SS
COUNTY OF RICHLAND)

I, Victor V. Vlasak, County Clerk in and for the County of Richland, do hereby certify that the above resolution is a true copy of the original adopted by the Richland County Board of Supervisors at the June meeting held on the 16th day of June, 1992.

Victor V. Vlasak
Victor V. Vlasak
Richland County Clerk

Vernon County Land Conservation Department
Viroqua, Wisconsin 54665

Pioneers in Soil and Water Conservation

RESOLUTION
Approving the Middle Kickapoo
Priority Watershed Plan

WHEREAS, the inventory and planning phases of the project have been completed under the direction of the Vernon, Monroe, and Richland County Land Conservation Committees in cooperation with the Wisconsin Department of Natural Resources and the Department of Agriculture, Trade and Consumer Protection; and

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

WHEREAS, a draft of the plan has been available for review and comments were accepted at a public hearing held August 29th, 1991; and

WHEREAS, the implementation of this plan will provide both technical assistance and cost share monies to eligible landowners within the priority watershed for the installation of conservation practices designed to reduce the sources of non point pollution and protect or improve the quality of water in the Kickapoo River Basin, now therefore be it

RESOLVED the Vernon County Board of Supervisors met in regular session, that "A Nonpoint Source Control Plan for the Middle Kickapoo River Priority Watershed" be approved; and be it further

RESOLVED that the Land Conservation Committee be given the authority and responsibility to act in behalf of Vernon County to administer this Priority Watershed Project as outlined in the plan.

Respectfully submitted,
Land Conservation Committee

George Nettum, Chairman

Robert Kelbel, Vice Chairman

Keith Fiske, Secretary

Raymond Nickelatti, Member

Norman Yttri, Member

Alvin Christianson, ASCS Member

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SUMMARY

Introduction

This priority watershed project plan assesses the nonpoint sources of pollution in the Middle Kickapoo River Watershed and guides the implementation of nonpoint source control measures. These control measures are needed to meet water resource objectives for the Middle Kickapoo River and its tributaries. Nonpoint sources of pollutants most commonly found in this watershed include:

1) polluted runoff from barnyards and feedlots;
2) sediment from cropland erosion;
3) sediment from eroding streambanks and gullies, and
4) nutrients and pesticides from cropland runoff.

The purpose of this project is to reduce the amount of pollutants from nonpoint sources that reach surface water and groundwater within the Middle Kickapoo River Priority Watershed Project area.

The plan was prepared by the Department of Natural Resources (DNR), the Department of Agriculture, Trade and Consumer Protection (DATCP), and the Vernon, Richland, and Monroe County Land Conservation Departments (LCD), with assistance from the University of Wisconsin-Extension. The DNR selected the Middle Kickapoo River Watershed as a priority watershed project through the Wisconsin Nonpoint Source Water Pollution Abatement Program in the fall of 1989. It joins over 50 similar watershed projects statewide in which nonpoint source control measures are being planned and implemented.

The project is administered on the state level by DNR and DATCP. The Vernon, Richland, and Monroe county LCDs administer the project on the local level with assistance from UW-Extension and the Soil Conservation Service (U.S. Department of Agriculture). Participation in the program by the landowners is voluntary. However, all participants must follow the requirements of the program's administrative rules (NR 120) and the Nonpoint Source Control Plan (which this document summarizes).

General Watershed Characteristics

The Middle Kickapoo River Watershed is a 250 square mile drainage basin located in the Driftless Area of Southeastern Wisconsin about 25 miles east of the Mississippi River. The

watershed contains the middle section of the Kickapoo River and all lands draining to it between the village of Ontario to the north and the confluence of the West Fork of the Kickapoo River to the south. Of the 250 square miles in the Middle Kickapoo River Watershed, 168 square miles (67%) lie within Vernon County, 46 square miles (19%) in Richland County, and 36 square miles (14%) in Monroe County.

The watershed has steep, wooded and agricultural lands, and a number of cold water streams that drain into the Kickapoo River. The watershed is divided into 14 smaller drainage areas called subwatersheds. They are: Bear Creek, Billings Creek, Brush Creek, Camp Creek, Chadwick Hollow, Cheyenne Valley, Elk Creek, Goose Creek, Hay Valley, Jug Creek, Otter Creek, Viola, Warner Creek, and Weister Creek.

Land use in the watershed, as shown in table S-1, is dominated by dairy farming. The watershed population is almost entirely rural. The 1990 population is estimated to be about 7,000 persons with only 1,840 residents living in the three incorporated villages of LaFarge, Ontario, and Viola.

Approximately 10,000 acres in the center of the watershed is federally owned and managed by the U.S Corps of Engineers. The federal land is primarily wooded with extensive wetlands. Wildcat Mountain State Park and Mt. Pisgah Scientific Area are also located in this watershed.

table S-1. Land Use in the Middle Kickapoo Watershed

Land Use	Acres	%
Cropland	44,136	30%
Grassland	11,834	8%
Pasture	18,362	12%
Woodlot	70,780	47%
Developed	2,465	2%
Wetland	1,250	1%
	148,827	100%

Water Quality and Objectives

All of the watershed's streams were assessed as to their current recreational and biological uses and their potential recreational and biological uses if nonpoint source pollutants were controlled. Common water resource problems in the watershed include streambank erosion, sedimentation of pool and riffle areas, organic loading from animal waste, elevated water

temperatures and extreme flooding. Recently, this watershed has experienced both drought and unusually severe spring flooding. The result of these extreme conditions has virtually eliminated two year classes of fish from several streams.

Kickapoo River

This part of the river has a marginal warmwater sport fishery consisting of smallmouth bass, channel catfish, northern pike, and panfish. Currently, a few brown trout and numerous rough species can be found. Bacterial sampling in 1990 found fecal coliform levels frequently above the water quality standard of 400 colonies/100ml. It is evident that considerable bacterial loading is received from the upstream watershed. Recreational and biological uses could be improved by reducing sediment and organic loading and fecal coliform bacteria levels.

High Level Management Subwatersheds

Bear Creek, Billings Creek, Camp Creek, Cheyenne Valley, Elk Creek, and Jug Creek are considered high level management subwatersheds. These subwatersheds generally contain some of the highest quality waters in the watershed, or have high potential for significant improvement. Many streams in these subwatersheds are managed as Class I and II brook and brown trout fisheries. Water resource objectives include maintaining and improving trout reproduction and establishing new wild trout fisheries. As a result, these subwatersheds have somewhat stricter control requirements and relaxed easement eligibility criteria.

Moderate Level Management Subwatersheds

Brush Creek, Chadwick Hollow, Goose Creek, Hay Valley, Otter Creek, Viola, Warner Creek, and Weister Creek are considered moderate level management subwatersheds. Streams in these subwatersheds generally contain Class III trout fisheries along with several forage species. Water quality problems common in the watershed are more prevalent in these subwatersheds. Water resource objectives include increasing the carry over of adult trout and maintaining the forage fishery.

Groundwater

Nitrate testing of 162 wells in the watershed found that 93 wells, or 57% of those tested, were in the Preventive Action Range. This indicates that the water is safe for consumption, but should be monitored yearly for quality changes. The survey also shows 7.4% of the wells currently have problems which require action.

Sources of Pollution

The Vernon, Richland, and Monroe County LCDs collected data on all agricultural lands, barnyards, manure storage sites, and streambanks in the watershed. Estimates were made of

the extent of gully erosion throughout the watershed. These data were used to estimate the pollutant potentials from these sources. The results of the investigations of nonpoint sources are summarized below:

1. **Barnyard Runoff Inventory Results**:
   - 358 barnyards were assessed
   - 50 barnyards contribute 50% of the organic pollutants
   - 2 barnyards have potential to adversely impact groundwater

2. **Manure Spreading Inventory Results**:
   - About 3,690 critical acres have manure applied
   - 317 landowners apply manure to critical acres
   - About 2,577 critical acres are spread on by 94 landowners who spread on 15 or more critical acres

3. **Streambank Erosion Inventory Results**:
   - 162 miles inventoried (13 streams)
   - 26,750 tons of sediment from eroding sites
   - There are 138 miles of eroding sites (85% of streambanks inventoried)

4. **Upland Sediment Inventory Results**:
   - 148,827 acres were inventoried
   - 31,811 tons of sediment are delivered to streams (83% from cropland)
   - 17,000 acres contribute 40% of the sediment
   - 20% of sediment is from the Brush Creek Subwatershed

5. **Gully Erosion Estimates**:
   - Gullies are estimated to contribute 27% of all sediment delivered to surface waters
   - 6,556 gullies are estimated to exist in the watershed

Pollutant Reduction Goals

To improve water quality in the tributaries of the Middle Kickapoo River Watershed, this plan calls for:

1. 60% reduction in phosphorus from barnyards in high management subwatersheds and 50% reduction in phosphorus from barnyards in moderate management subwatersheds.
2. 50% reduction in the total sediment reaching streams from the combination of upland field erosion, streambank erosion, and gully erosion.

Management Actions
Eligible Conditions For Cost Sharing

The watershed plan establishes criteria to define which nonpoint sources are eligible for cost sharing through the project. Cost share funds for installing pollutant control measures will be targeted only at those sources which meet these conditions.

These conditions are established because the majority of pollutants that reach surface waters come from less than one-half of the farm operators in the watershed. All landowners eligible to receive cost share funds will be contacted by the Vernon, Richland, and Monroe County Land Conservation Departments during project implementation. All critical sources of nonpoint pollutants must be controlled if a landowner wishes to participate in any aspect of the program.

The following is a brief description of critical nonpoint pollutant source conditions that will be eligible for cost sharing through the project. These conditions are further explained in Chapter 4 of the full Watershed Plan. Practices eligible to control the identified nonpoint sources are listed on table S-3.

Upland Runoff

All lands with sediment rates greater than 0.20 t/ac/yr (according to the WIN model) and an erosion rate greater than the soils "T" value (according to the USLE equation) will be eligible for cost sharing and must be brought down to an erosion rate equal to the soils "T" value. Fields meeting these conditions must be controlled for a landowner to participate in the program.

Lands with either

a) sediment rates less than .20 t/ac/yr and erosion rates greater than "T" ; or b) sediment rates greater than .20 t/ac/yr and erosion less than "T", are eligible for cost sharing. Controls on fields meeting these conditions are optional for a participating landowner.

Barnyard Runoff

Barnyards with phosphorus loading values of 20 pounds or greater (according to BARNY model) are required to control the barnyard runoff to a value of 10 pounds or less to participate in the program. Barnyards with phosphorus loading values less than 20 pounds may also be required to reduce runoff depending on the specific subwatershed management criteria contained in Chapter 4 of the Watershed Plan. In addition, participants who install barnyard control systems will also be required to develop a SCS 590 nutrient management plan for their operation.

Manure Spreading

Middle Kickapoo River project participants who winter-spread manure on more than 15 acres of "unsuitable" land will be targeted for control measures. In this project "unsuitable" lands for winter spreading of manure are those lands with greater than six percent slope or which are flood prone. The Vernon, Richland, and Monroe County LCDs will assist farm operators in preparing a SCS 590 nutrient management plan for their farm operation. A nutrient management plan identifies the proper spreading periods, application rates, and acceptable fields for manure spreading.

Some of the nutrient management plans may identify the need for manure storage facilities to prevent winter spreading of manure on unsuitable lands. If a storage system is cost shared through the watershed project, then no critical lands (as defined by the plan and SCS Specification 590) may be winter spread.

In addition, Monroe, Richland, and Vernon counties will be required to enact a manure management ordinance implementing requirements outlined by the DATCP before the end of the eight year implementation phase of this project.

Streambanks

All participating landowners throughout the watershed project will be required to control 60% of the sediment loading and 40% of the length of streambank sites adjacent to agricultural lands.

Easements to support critical area stabilization and shoreline buffer practices along perennial streams in the high level management subwatersheds will be considered using relaxed eligibility criteria.

Limited term grazing will be required as a management practice throughout the watershed project where bottomland pastures are used for grazing and the streambanks are eroded, trampled or slumped.

Gully Erosion

Gully erosion control measures are eligible for cost share funding throughout the watershed if the gully is determined to be contributing sediment to surface waters. Participating landowners will be required to control 60% of the gullies on their property.

Logging and Access Roads

Erosion control measures will be eligible for cost-sharing assistance throughout the watershed where it is determined that a road is contributing significant amounts of sediment to surface waters. These practices may be required of participating landowners based on specific criteria contained in Chapter 4 of the Watershed Plan.

Funds Needed For Cost Sharing, Staffing, and Educational Activities

Grants will be awarded to Vernon, Richland and Monroe counties by the DNR for cost sharing, staff support, and educational activities. Table S-2 shows estimates of the financial assistance needed to implement nonpoint source controls in the Middle Kickapoo River Watershed, assuming a 75% participation rate of landowners.

table S-2. Total Project Costs at 75% Landowner Participation Rate

Item	Costs (State Share)
Cost Share Funds: Practices	$3,935,558
Cost Share Funds: Easements	$75,000
Local Assistance Staff Support *	$1,164,192
Information/Education Direct	$17,430
Other Direct (travel, supplies, etc.):	$59,832
Total:	$5,252,012

* Salary + Indirect = $30,000/person/year

Project Implementation Procedures

The following is an outline of the steps in carrying out this plan:

1. "Nonpoint Source Control Plan for the Middle Kickapoo River" is formally approved by the Vernon, Richland, and Monroe County Boards, the Dept. of Agriculture, Trade and Consumer Protection, and the Dept. of Natural Resources.

2. DNR awards two grants to each of the counties in the watershed:
   a. Local Assistance Grant Agreement - Amendment: This provides funds to the county to hire the staff and support needed to carry out the plan.
   b. Nonpoint Source Grant Agreement: This provides funds for the county to pay landowners cost sharing for the proper installation of approved Best Management Practices (BMPs).

3. County LCDs contact eligible landowners (as identified in the plan) to explain the program and encourage the signing of a Cost Share Agreement. Landowners may enter into Cost Share Agreements with the county only during the first 3 years of the project. The Cost Share Agreement defines the types and amounts of BMPs needed, the estimated costs, the cost share amount, the schedule for installation, and the landowner's responsibilities for maintaining the BMPs.

4. Upon entering into a Cost Share Agreement, the county LCD schedules practice installation (no more than 5 years after signing of agreement), designs the BMPs, and insures that the BMPs are installed in compliance with the approved designs.

5. After paying for the BMPs, the landowner submits proof of payment to the County LCD and the landowner is reimbursed the cost share amount.

Information and Education

An information and education program will be conducted throughout the project period with the Vernon, Richland, and Monroe County LCDs having overall responsibility for the program. University of Wisconsin-Extension in the county will also have major responsibilities for assistance. This program will be most intensive during the first three years of the project and activities will taper off during the rest of the project. The activities will include Best Management Practice demonstrations, tours, newsletters, and public meetings.

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:

Administrative

This includes the progress in providing technical and financial assistance to eligible landowners, and carrying out education activities identified in the plan. Progress in this area will be tracked by the LCD and reported to the DNR and DATCP quarterly.

Pollutant Reduction Levels

Reductions in nonpoint source pollutant loadings resulting from changes in land use practices will be calculated by the LCD and reported to DNR and DATCP at an annual review meeting.

Water Resources

Changes in water quality, habitat, and water resource characteristics will be monitored by the DNR during implementation and at the end of the project period.

table S-3. Eligible Management Practices & State Cost-Share Rates

Best Management Practice	State Cost Share Rate	
Contour Farming	50%	(1)*
Contour Strip Cropping	50%	(1)*
Field Diversions and Terraces	70%	
Grassed Waterways	70%	
Reduced Tillage (No-till)	50%	(1)*
Critical Area Stabilization +	70%	(2)
Grade Stabilization Structures +	70%	
Agricultural Sediment Basins	70%	
Shoreline and Streambank Stabilization +	70%	(1)
Shoreline Buffers +	70%	(2)
Wetland Restoration +	70%	
Barnyard Runoff Management	70%	
Animal Lot Relocation +	70%	
Manure Storage Facilities	70%	**
Sinkhole & Crevice Treatment	70%	
Livestock Exclusion from Woodlots	50%	(1)
Wetland Restoration	70%	(2)
Nutrient and Pesticide Management	50%	(3)
Logging and Access Road Treatment	70%	

(1) Flat rates for these BMPs can be found in table S-4 (below)
(2) Easements may be entered into with landowners identified in the watershed plan in Chapter 4 with these BMPs. See Chapter 4 for where easements apply.
(3) Spill control basins have a state cost-share rate of 70%
* Wildlife habitat restoration components of this practice are cost shared at 70%
** Maximum cost share is $10,000 including nor more than $5,000 for manure transfer equipment
\+ State share can be raised to 80% if County provides 10% cost sharing

table S-4. Practices Using a Flat Rate for State Cost-Share Funding

Best Management Practice	Flat Rate	
Contour Farming	$6.00/ac.	
Strip Cropping	$12.00/ac.	
Reduced Tillage	$15.00/ac.	(1)
Fencing		

(1) Reduced tillage systems for short crop rotations, and establishment of forages and small grains (includes no-till methods). One year only.

CHAPTER ONE
Introduction, Purpose, and Legal Status

Nonpoint Source Water Pollution Abatement Program

The Wisconsin Nonpoint Source Water Pollution Abatement Program was created in 1978 by the State Legislature. The goal of the 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 168 square-mile Middle Kickapoo River Watershed, located in Monroe, Richland, and Vernon Counties, was designated a "priority watershed" in 1989.

Nonpoint sources of pollution include: eroding agricultural lands, streambanks, roadsides, and developing urban areas, runoff from livestock wastes, and established urban areas. 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 Program:

1) The Program is administered by the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP). It focuses on critical hydrologic units called priority watersheds. The program is implemented through priority watershed projects.

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

3) Upon approval by state and local authorities, the plan is implemented by local units of government. Water quality improvement is achieved through voluntary implementation of nonpoint source controls (Best Management Practices) and the adoption of ordinances. Landowners, land renters, counties, cities, villages, towns, metropolitan Sewerage Districts, sanitary districts, lake districts, and regional planning commissions are eligible to participate.

4) Technical assistance is provided to aid in the design of Best Management Practices. State level cost share assistance is available to help offset the cost of installing these practices. Eligible landowners and local units of government are contacted by the County Land Conservation Departments to determine their interest in voluntarily installing the Best Management Practices identified in the plan. Cost share agreements are signed listing the practices, costs, cost share amounts and a schedule for installation of management practices.

5) Informational and educational activities are offered to encourage participation.

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

Legal Status Of The Nonpoint Source Control Plan

The Middle Kickapoo 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 DNR, DATCP, the Monroe, Richland, and Vernon County Land Conservation Departments, local units of government, and the Middle Kickapoo River Priority Watershed 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 plan was written with the best information available at the time of its preparation. Situations and conditions may change during the implementation of this plan, requiring changes in this document. Any revisions to this document must be approved by the counties involved and the DNR.

Plan Organization

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

Part 1 - The Watershed Assessment

Chapter 2: "Description of Watershed," is an overview of the cultural and natural resource features pertinent to planning and implementation efforts for the priority watershed project.

Chapter 3: "Water Quality Conditions, Objectives and Nonpoint Pollution Sources," presents field inventory results and identifies the water quality or water resource problems and improvements that can be obtained through implementation of a nonpoint source control project. The chapter discusses the level of pollutant control needed to achieve the water resource objectives, and describes the nonpoint sources and other sources of pollution.

Chapter 4: "Management Actions," identifies the level of urban and rural nonpoint source pollution control needed to meet the water quality objectives. Eligibility criteria for funding to control nonpoint sources under the priority watershed project are also presented.

Part 2 - Detailed Program for Implementation

Chapter 5: "Local Governments Implementation Program," describes the means by which the local units of government administer the project, estimates a local assistance and management practice cost share budget, and identifies an information and education program.

Chapter 6: "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 Middle Kickapoo River Watershed.

Part 3 - Project Evaluation

Chapter 7: "Progress Assessments," discusses the means for assessing the amount of nonpoint source control gained through installation of best management practices in the watershed.

Chapter 8: "Evaluation Monitoring," presents a strategy and schedule for monitoring to determine the water quality impacts of implementing nonpoint source controls in the Middle Kickapoo River Watershed.

CHAPTER TWO
General Watershed Characteristics

Location

The Middle Kickapoo River Watershed is a 250 square mile drainage basin located in the Driftless Area of Southwestern Wisconsin about 25 miles east of the Mississippi River. The watershed contains the middle section of the Kickapoo River and all lands draining to it between the village of Ontario to the north and the confluence of the West Fork of the Kickapoo River to the south (see map 2-1). It includes rural portions of Monroe, Richland, and Vernon Counties.

The Kickapoo River is the largest tributary to the Wisconsin River and as such is part of the Lower Wisconsin River Basin. The Kickapoo River Valley is an important state resource for canoeing and other forms of outdoor recreation and tourism.

Cultural Features

Governmental Units

Of the 250 square miles in the Middle Kickapoo River Watershed, 168 square miles (67%) lie within Vernon County. Richland County contains 46 square miles (19%) while the remainder, 36 square miles (14%), is located in Monroe County.

Incorporated areas include the villages of La Farge, Ontario, and Viola. A portion of the village of Ontario lies outside the watershed boundary. Unincorporated areas include all or portions of 13 surrounding townships.

Significant public land areas include Wildcat Mountain State Park, Mt. Pisgah Scientific Area, and considerable land holdings in the Kickapoo River Valley (nearly 10,000 acres) by the U.S. Army Corps of Engineers.

Population

The 1990 population is estimated to be about 7,000 persons with the majority residing in Vernon County. Most of this population lives outside incorporated areas, in small areas of residential development or on farmsteads. An estimated 26% (1840 residents) of the

population live in the three incorporated villages. The fastest growing villages are La Farge and Ontario which experienced population increases of about 11% in the last decade. Regional trends suggest that the population will remain about the same or increase slightly over the next 20 years.

Land Use

Agricultural and related open space are the most important land uses, comprising 50% of the land area. Woodlands are also abundant and cover nearly 48% of the land area. Urban land uses occupy less than 2% of the Watershed. See table 3-1 for land use distribution.

Sanitary Sewer Service

Sanitary sewer service is available in the villages of La Farge, Ontario, and Viola. All three sewage treatment plants deliver treated effluent directly, or via feeder creeks, to the Kickapoo River. The remainder of the watershed residents rely on private onsite systems.

Public Water Sources

All potable water in the watershed is obtained from groundwater sources. The principal aquifers are the Prairie du Chien dolomite and Upper Cambrian sandstone in the uplands, and the alluvial sands and gravel in the valleys. Water obtained from these aquifers is either pumped from individual wells owned by homeowners or businesses, or is obtained by municipal pumping facilities. All three incorporated villages operate municipal water supply systems.

Physical Setting

Climate and Precipitation

The frequency, duration, and amount of precipitation influences quality of surface and groundwater. The Middle Kickapoo River Watershed lies in the temperate continental zone. Winters are cold and snowy and summers are mostly warm with periods of hot humid conditions. Average annual precipitation for the region is about 32 inches of rain and melted snow. The majority of precipitation falls in the form of thunderstorms during the growing season (May-September).

The deep ridge and valley topography of the area is conducive to fast runoff and often results in flash flooding. Runoff averages about 8 inches per year; however, enough water percolates to the water table to insure maintenance of abundant spring flow during normal

periods. Most runoff occurs in March, April, and May when the land surface is either frozen or saturated following the spring thaw.

Topography

The Middle Kickapoo Watershed is located entirely within the unglaciated Wisconsin Driftless Area and lies within the geographical province known as the Western Uplands. In general, topography in the watershed is characterized by an upland plateau dissected by a maze of steep ridges, deep narrow valleys, and numerous small springfed streams. The "coulee region" ridges rise as high as 400 feet above the valley floor. Agricultural production on the steep slopes of the region often results in severe erosion.

Soils and Geology

Most of the Middle Kickapoo River Watershed is underlain by soils derived from sedimentary rocks. Dolomitic limestone and sandstone are the two basic bedrocks of the region. The oldest underlying rock formation is the Cambrian sandstone which is evident along the deepest valleys. Above this sandstone layer is the Prairie du Chien dolomite. The dolomite underlies the ridges in the watershed, and outcroppings are common. All of the watershed is covered by a layer of loess (or silt) spread over the region by westerly winds following glaciation of surrounding lands. In valley areas, loess, alluvium, and colluvium form the uppermost deposits. These materials, in addition to weathered bedrock, are the parent materials for the soils in the region.

The predominant soils in the Middle Kickapoo River Watershed are the silty loams of the uplands and the sands and sandy loams of the valleys. Soils of the valley slopes and upland ridges are generally rapid to well-drained with a high potential for soil loss. Valleys widen in the lower portion of the watershed. Steam terraces and bottom lands in this region are composed of fine-textured material washed down from uplands and are moderate to poorly drained loams and silty loams.

Surface Water Resources

Land drainage patterns in the Middle Kickapoo River Watershed are delineated as 14 individual subwatersheds. All convey surface water directly, or via tributaries, to the Kickapoo River. Major tributaries, associated streams, and subwatershed divides are shown on map 2-1.

Streams

Perennial and intermittent streams are the predominant surface water features. Perennial streams, which have a combined length of about 150 miles, maintain at least a small continuous flow throughout most of the year. The middle section of the Kickapoo River, from Ontario to the confluence of the West Fork Kickapoo River is 40.5 miles long. The primary streams in the watershed contributing flow to the Kickapoo River are Elk, Camp, Bear, Warner, Cheyenne Valley, Billings, Brush, Weister, and Otter creeks. Altogether, there are about 50 perennial streams in the watershed. See table 2-1 for a list of named perennial streams in the watershed and their length. Water quality in the Kickapoo River is characterized as generally fair to good, although the river often has high suspended solids and nutrient concentrations following peak runoff events. Fecal coliform levels are high, especially in the northern reaches of the river near Ontario, suggesting contribution of pollutants from the upstream sections of the Kickapoo River beyond the northern boundaries of the watershed. The entire Kickapoo River is classified as a Warm Water Sport Fishery.

Water quality in tributaries to the Middle Kickapoo is generally good. Stream temperatures and dissolved oxygen levels are generally suitable for trout. Siltation from high water, and streambank and habitat degradation are widespread problems.

Most of the tributary streams contain significant reaches of Class III and Class II trout water. Elk and Camp Creeks are classified as Class I trout waters. Brown trout is the primary sport fish species. Many streams are not reaching their highest potential use due to pollution from nonpoint sources. (See Chapter 3 for detailed information on water quality condition of individual streams.)

Flooding is a frequent occurrence in the Kickapoo River watershed. Many 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 and contributing sediment to the streambed during high water events. Excessive flooding in the watershed is primarily due to a combination of steep topography and the predominance of agricultural land use. It is expected that high water extremes could be reduced to some extent by improved land management practices that would increase infiltration and reduce peak runoff rates.

Intermittent streams flow only when there is runoff or when groundwater discharge is highest. These streams are particularly susceptible to nonpoint source pollution in the Middle Kickapoo River watershed due to their small size and the flashy nature of runoff events in this watershed. Intermittent waterways make up the headwaters of the larger perennial streams.

Lakes

Lakes are not a common feature of the driftless landscape. A few large ponds are present in the Middle Kickapoo River Watershed. These ponds may contain seasonal populations of

various sport fish species; however, their shallow depths make them subject to winterkill conditions.

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 comprise 1250 acres, or 1.0 percent, of the Watershed.