The sediment contribution to surface water from upland sources in the Trotter Branch Subwatershed is 1,276 tons per year, or about seven percent of the entire watershed load. Ninety percent of this load originates from cropland, which covers 81 percent of the subwatershed.

***Water Resource Objectives***: Objectives are to reduce organic loading and erosion, increase aquatic diversity, protect and restore wetlands and improve wildlife habitat.

## WIOTA EAST SUBWATERSHED (WE)

***Description***: Wiota East (Map 11) lies in the southeastern portion of the watershed and contains 4,869 acres. This subwatershed has the highest percentage of wetland acres of any subwatershed at 18 percent or 896 acres. The small community of Woodford lies within Wiota East in the northwestern corner. Highway Y delineates the northern border with Trotter and the Pecatonica itself as the western boundary.

***Water Resource Conditions***: Unnamed spring-fed streams drain this subwatershed flowing westward and emptying into the Lower East Branch Pecatonica River. The actual surface waters represent an insignificant resource and therefore were not appraised.

***Nonpoint Pollutant Sources***: Two livestock operations in the Wiota East Subwatershed account for 68 percent of the organic load (126 pounds). Wiota East contains a total of 19 livestock operations.

The streambanks in the Wiota East Subwatershed contribute one percent of the watershed sediment load, or 59 tons, annually. This comes out to a sediment rate of 7.4 tons per mile. Nineteen percent or 7,910 feet of streambanks are either eroded, slumped, or trampled by livestock.

The Wiota East Subwatershed supplies 1,082 tons of sediment per year to the Lower East Branch Pecatonica system. This is six percent of the sediment in the entire watershed. Eighty-five percent of this load (915 tons) is derived from 2,399 cropland acres, or 54 percent of the land area. Wiota East has the largest sediment delivery to wetland areas at 51 tons annually.

***Water Resource Objectives***: To protect and restore wetlands and to improve wildlife habitat.

## WIOTA WEST SUBWATERSHED (WW)

***Description***: Wiota West (Map 11) is a relatively small subwatershed with only 2,939 acres making up three percent of the watershed. Wiota West is located on the very southern tip of the Lower East Branch of the Pecatonica. Wiota West drains directly into the Pecatonica. Sixty-five percent of the subwatershed is cropped. Highway 78 runs along the western edge of the Wiota West Subwatershed.

***Water Resource Conditions***: Unnamed spring-fed streams drain this subwatershed flowing eastward and emptying into the Lower East Branch Pecatonica River. The actual surface waters represent an insignificant resource and therefore were not appraised.

***Nonpoint Pollutant Sources***: Wiota West Subwatershed has the second highest phosphorus load of the entire watershed. Twenty barnyards generate 418 pounds of phosphorus. Eighty-seven percent of the total load is coming from only six yards.

A total of 28,800 feet of streambank were inventoried in the Wiota West Subwatershed. Approximately 2,250 feet were found to deliver 32 tons of soil annually into the stream. Twenty-two percent of the total length inventoried contained areas that were trampled by cattle.

Runoff from cropland delivers 605 tons of sediment annually to the surface waters of the Wiota West Subwatershed. This is 89 percent of the upland sediment load with pastureland and grazed woodlots supplying another eight percent. Cropland accounts for 62 percent of the land use. Wiota West adds less than four percent of the entire upland sediment load.

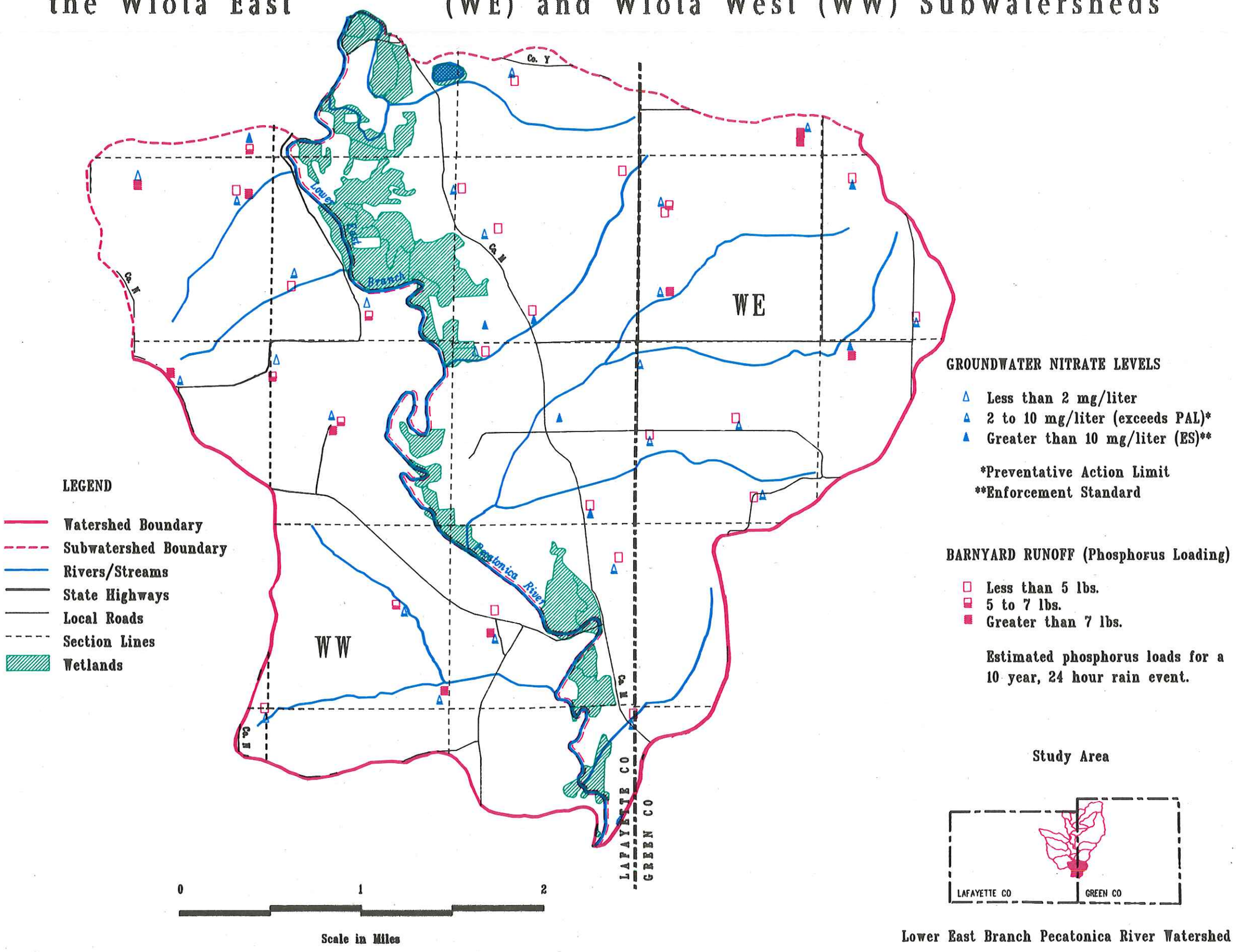
***Water Resource Objectives***: To protect and restore wetlands and improve wildlife habitat.

## 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.

* Upland Sediment Erosion: reduction goal of 25 percent of sediment.
* Gully Erosion: control gullies producing over 30 tons sediment/site/year.
* Barnyard Runoff: reduction goal of 60 percent of phosphorous load.
* Winterspreading of Manure: reduction goal of 50 percent of the critical acres spread.
* Streambank Erosion: reduction goal of 40 percent sediment delivered to streams and 25 percent overall repair of bank habitat.
* Wetlands: restoration of 30 percent of degraded wetlands.

# Map 11: Groundwater Nitrate Levels and Barnyard Runoff Results in the Wiota East (WE) and Wiota West (WW) Subwatersheds




Lower East Branch Pecatonica River Watershed

## OTHER POLLUTION SOURCES

### MUNICIPAL AND INDUSTRIAL POINT SOURCES OF WATER POLLUTION

Possible sources of pollution in the watershed include three cheese factories and one dairy. In addition, discharges of wastewater from permitted municipal and industrial sources are important considerations for improving and protecting surface water resources. Refer to the Sugar-Pecatonica River Basin Areawide Water Quality Management Plan (November, 1988) for additional details on potential point sources. Treated effluent enters from municipal sewage plants located at Blanchardville and Argyle. Most of these point sources are controlled through permits which the DNR issues under the Wisconsin Pollution Discharge Elimination System (WPDES) permit system.

# CHAPTER IV
# RECOMMENDED MANAGEMENT ACTIONS: CONTROL NEEDS AND ELIGIBILITY FOR COST-SHARE FUNDING

## INTRODUCTION

This chapter describes the management actions developed to meet the pollution reduction goals established during the water resource appraisal process. Also, the criteria which determine the eligibility of each pollutant source for cost-share funding through the nonpoint source program are described in this chapter.

## MANAGEMENT CATEGORIES

Nonpoint source control needs are addressed by assigning "management categories" to each major nonpoint source pollution site (barnyards, manure spreading, upland fields, streambank erosion or habitat degradation sites). Management categories define which nonpoint sources are eligible for financial and technical assistance under the priority watershed project. Categories are based on the amount of pollution generated by a source, and the feasibility of controlling the source. Management category eligibility criteria are expressed in terms of **tons of sediment** delivered to surface waters from eroding uplands and streambanks; **pounds of phosphorus** delivered to surface waters during a 10-year, 24-hour storm; **the number of unsuitable acres** winter-spread with manure annually; and the feet of streambank trampled by cattle. A definition of each management category is given below. Following this are the criteria used to define the management categories for each pollutant source.

**The criteria used to define these management categories must be confirmed at the time that the county staff visit the site. A source may change management categories depending on the conditions found at the time of the site visit. A source may be revised up to the point that a landowner signs a cost-share agreement. Any sources, created by a landowner, requiring controls after the signing of a cost-share agreement must be controlled at the landowners expense.**

***Management Category I***: Nonpoint sources included in this category contribute a significant amount of the pollutants impacting surface waters. A reduction in their pollutant load is essential for achieving the water quality objectives in the watershed project.

Nonpoint sources in Category I are eligible for funding and/or technical assistance under the priority watershed project. As a condition of funding, all sources in Management Category I must be controlled if a landowner wishes to participate in any aspect of the watershed project.

***Management Category II***: Nonpoint sources in this category collectively contribute less of the pollutant load than those in Management Category I. These nonpoint sources are identified and included in cost-sharing eligibility to further insure that water quality objectives for pollutant controls are met. Nonpoint sources in this category are eligible for funding and/or technical assistance under the priority watershed project. Controlling sources in this category is not mandatory for a landowner to be funded for controlling other sources.

***Management Category III***: Nonpoint sources of pollution in this category do not contribute a significant amount of the pollutants impacting surface waters and are not eligible for funding and/or technical assistance under the priority watershed project. Other Departmental programs (e.g. wildlife and fisheries management) can, if warranted, assist county project staff to control these sources as implementation of the integrated resource management plan for this watershed. Other federal programs may also be applicable to these lands.

Conclusions from the Lower East Branch Pecatonica Water Resources Appraisal Report (January, 1991) indicate that the control of organic matter from barnyard runoff is critical to the success of this project. While reduction of sediment from all sources is a goal of the project, phosphorus reduction will be the primary objective of this project.

## CRITERIA FOR ELIGIBILITY AND MANAGEMENT CATEGORY DESIGNATION

### CROPLANDS AND OTHER UPLAND SEDIMENT SOURCES

***Upland Erosion***: Upland erosion represents 68 percent (17,897 tons) of the total sediment load to streams in the watershed. A 25 percent reduction in sediment from eroding fields was targeted for agricultural lands. This translates into bringing all lands that are contributing sediment to streams at a rate greater than "T" (the tolerable soil loss) down to "T". To be in Category I, landowners' fields must be above "T" and contributing greater than 0.26 tons/acre/year of sediment. The average sediment delivery rate for all subwatershed is 0.26 tons/acre/year. This category will control an estimated 10,670 "critical" acres of cropland, 19 percent of the total sediment load (3,429 tons) of the watershed.

An additional 16 percent of the sediment load delivered to the stream will be controlled through Category II, which includes an estimated 17,458 critical acres, controlling 2,507 tons. Category II includes those landowners with fields below "T" but delivering sediment at a rate over 0.26 tons/acre/year and landowners with fields above "T" but below the sediment delivery rate. While fields in this category are few, including these will allow for a more holistic approach to sediment control. See Table 10.

***Gully Erosion***: Note: A complete field inventory for gully erosion was not done for this project. Data are estimates, based mainly on office review of air photos.

Gully erosion produces approximately nine percent (2,361 tons) of the sediment being delivered to streams in the watershed, and so is a relatively minor sediment source. Gullies producing over 30 tons of sediment per site per year will require control. Those producing between 30 and 1.5 tons per site per year will be eligible for control. The majority of gullies in Category II are in croplands and can be controlled with waterways and other non-structural means. Gullies producing less than 1.5 tons per site per year will not be eligible for cost sharing.

County staff will take into account technical feasibility and cost effectiveness when determining which gullies are in Management Category I. See Table 10.

Table 10. Upland Sediment and Gully Erosion Eligibility Criteria in the Lower East Branch Pecatonica River

**Upland Erosion**

| Management Category | Eligibility Criteria Sediment Delivery (tons/acre/year) | | Soil Loss (tons/acre/year) | Percent Control |
|---|---|---|---|---|
| I | over 0.26* | & | over "T" | 19% |
| II | over 0.26* | & | under "T" | 14% |
| | Fields in upper left quadrant are below sediment delivery and above "T" | | | 2% |

*The average sediment delivery rate of all subwatersheds is 0.26 tons/acre/year

**Gully Erosion**

| Management Category | Eligibility Criteria (tons sediment/site/year) |
|---|---|
| I | over 30 |
| II | between 30 and 1.5 |
| III | less than 1.5 |

Sources: Green and Lafayette Land Conservation Departments, DNR, DATCP

## ANIMAL LOT RUNOFF

A high level of control of animal lot runoff is required in order to achieve the water quality objectives in the Lower East Branch Pecatonica project. A 60 percent reduction of organic loading is necessary in all subwatersheds to meet stated objectives. Category I landowners are those whose operations produce over seven pounds of phosphorous. These landowners will need to reduce loads down to five pounds or less in order to reach water quality goals. Ninety-seven landowners fall into this category, yielding 70 percent control. Landowners whose operations produce between seven and five pounds phosphorous will need to reduce this load to five pounds or less to be eligible for cost sharing. Thirty-eight barnyards fall into this category, yielding five percent control. See Table 11.

County personnel should focus on getting higher control in high priority subwatersheds. These include the following cold water streams: Apple Branch, Brennan Creek, Dougherty Creek, Erickson Creek, Mud Branch, Sawmill Creek, and Whiteside Creek.

Table 11. Animal Lot Runoff Eligibility Criteria in the Lower East Branch Pecatonica River

| Management Category | Phosphorus Load per barnyard | # Barnyards | Phosphorus Reduction |
|---|---|---|---|
| I | greater than 7 lbs | 97 | 70% |
| II | between 7 and 5 lbs | 38 | 5% |
| III | less than 5 lbs | 235 | ~ |

* This is the phosphorus load result from the Wisconsin revised ARS model under a 4.2" rainfall.

Source: Green and Lafayette County Land Conservation Departments, DNR, DATCP

## MANURE-SPREADING RUNOFF

A 50 percent reduction in the total "critical acres" was deemed essential to meet water quality goals. Critical acres are defined as those lands of greater than six percent slope or which are flood prone.

Category I project participants (approximately 95) are those who winter-spread manure on more than 20 acres of "unsuitable" land. These landowners are required to implement and adhere to a Soil Conservation Service (SCS) Technical Guide Standard "590 Nutrient Management Plan". Category II participants (approximately 65), are those who spread manure on land between 10 and 20 acres.

The actual critical acres that a landowner winterspreads must be confirmed during the county staff's farm visit. This confirmation is based on an evaluation of the actual acres that a landowner spreads in the winter. The decision on whether an operation needs a storage facility or not is based upon an individuals ability to safely spread manure in the winter through the SCS "590 Nutrient Management Plan". If a landowner is unable to meet this plan, then a short or long term storage system may be necessary. If a storage system is cost shared through the watershed project then no critical lands (as defined by the SCS Specification 590) may be winterspread. See Table 12 for estimated acres and operations that this project will affect.

Table 12. Manure Spreading Runoff Eligibility Criteria

| Management Category | Number of Critical Areas Winterspread* | Acres/Landowners | Percent Reduction |
|---|---|---|---|
| I | 20 or more | 2,433/95 | 51% |
| II | between 10 and 20 | 364/65 | 8% |

* These acreages apply to individual landowners.

Sources: Green & Lafayette County Land Conservation Departments, DNR, DATCP

## STREAMBANKS

***Streambank Erosion***: Streambanks contribute 23 percent of the overall sediment delivered to streams in the watershed. Category I participants are those with identified sites eroding at a rate of 0.07 tons per linear foot per year. County staff will evaluate site accessibility/feasibility on Category I sites. If all Category I streambanks are controlled, the goal of a 40 percent reduction in streambank erosion will be achieved. Category II participants are also eligible for streambank erosion control practices.

Eligible streambanks are those with an erosion rate between 0.07 and .015 tons per linear foot of eroding bank per year.

Category III streambanks are those with an erosion rate of less than .015 tons per linear foot of eroding bank per year.

***Livestock Access:*** Category I (essential) streambanks include trampled sites over 2,000 feet per property owned. Category II (eligible) streambanks are all other sites. The amount of 2,000 feet was chosen because this will control 40 percent of the trampled feet of streambank in the watershed. There are 12 landowners whose properties (40,940 streambank feet) fall into Category I. These landowners have property where several long segments of the stream are trampled on both sides.

Access restrictions will be outlined in a grazing management plan, which county staff will develop, and may include fencing, allowing the cattle access to the stream only during limited times of the year, or limiting herd size. The timing and period of access allowed is determined by the County Land Conservation Department (LCD) with agreement from the Department of Natural Resources (DNR) and the Department of Agriculture, Trade, and Consumer Protection (DATCP). Participating landowners with Category I sites will develop these grazing management plans as part of the cost-share agreement.

The purpose of the grazing management plan is to protect and stabilize areas immediately adjacent to streams. County staff will use their discretion concerning cost effectiveness and feasibility when applying best management practices (BMPs) to protect and stabilize agriculturally affected streambanks. See Table 13.

In addition, eroding streambanks on the main stem of the Pecatonica are limiting canoeing and fishing opportunities in the river. Riprapping and logjam removal are needed in several locations to control future erosion.

## WETLAND RESTORATION

There will be no Category I for wetland restoration. All inventoried wetlands (131 sites) will be Category II (eligible) for restoration. The targeted goal is to restore 30 percent (40 sites) of the wetlands sites inventoried. See Chapter II for inventory details.

Wetland restoration is an eligible BMP for the purpose of controlling nonpoint sources of pollution. Secondary benefits of wetland restoration may be enhancement of fish and wildlife habitat.

Wetland restoration includes: the plugging or breaking up of existing tile drainage systems, the plugging of open channel drainage systems, other methods of restoring the pre-development water levels of an altered wetland, or fencing of livestock out of a wetland.

Wetland restoration is an eligible practice when applied to any of the following:

1. Cultivated hydric soils with tile or open channel drainage systems discharging to a stream or tributary.

   Wetland restoration will reduce the amount of nutrients and pesticides draining from the altered wetland to a water resource either by establishing permanent vegetation or altering the drainage system.

Table 13. Streambank Eligibility Criteria for the Lower East Branch Pecatonica River Watershed

| Management Category | Criteria |
|---|---|
| **Streambank Erosion** | |
| I | Streambanks with an erosion rate of 0.07 tons per linear foot of eroding bank per year.* |
| II | Streambanks with an erosion rate of between 0.07 and 0.015 tons/linear foot of eroding bank per year.* |
| III | Streambanks with an erosion rate of less than 0.015 tons/linear foot of eroding bank per year.* |

* Sediment load reductions are applied on a riparian landowner basis.

| | |
|---|---|
| **Streambank Habitat** | |
| I | Trampled sites over 2,000 feet/landowner. |
| II | All other sites. |

Sources: Green and Lafayette Land Conservation Departments, DNR, DATCP

2. Pastured wetlands riparian to streams, or tributaries.

   Eliminating livestock grazing within wetlands will reduce the organic and sediment loading to the wetland and adjacent water resource, and reduce the direct damage to the wetland from the livestock. Streambank fencing to exclude livestock will control the pollutants and restore the wetland.

3. Previously converted wetlands downslope or upslope from fields identified as Management Category I upland sediment sources through the WIN model.

   Restoration of wetlands in these situations accomplishes either: creates a wetland filter which reduces the pollutants from an upslope field(s) to a water resource; or reduces the volume and/or velocity of water flowing from an up-slope wetland to a down-slope critical field. Two eligibility conditions must be met to use wetland restoration in this situation:

   * All upland fields draining to the wetland must be controlled to a soil loss rate that is less than or equal to the soils "T" value.

   * One or more of these same fields must still have a sediment loss rate (after the application of any erosion control measures) greater than the "average sediment delivery rate".

## EASEMENTS

Nonpoint source program funds may be used to purchase land easements in order to support specified BMPs. These practices, all of which involve the establishment of permanent vegetative cover, include:

* Shoreline buffers.
* Critical area stabilization.
* Wetland restoration.

In addition to supporting the above named practices, easements may also be purchased for the support of a wetland restoration practice. These two applications are described below.

***Easements to Protect Critical Area Stabilization and Shoreline Buffers***: The following guidelines and criteria are for the purchase of easements used to protect critical area stabilization, and shoreline buffers exclusive of wetland restoration. However, critical wetlands could be protected from nonpoint source pollution with a shoreline buffer easement. Guidelines for using easements in conjunction with wetland restoration are presented later on in this plan.

1. Land adjacent to "high priority" water resources: These are the highest priority areas for obtaining easements to support critical area stabilization and shoreline buffers. These water resources are those streams and

wetlands that are most sensitive to nonpoint pollution. Additional benefits include enhancements to aquatic habitat and, if the landowner agrees, public access to surface waters.

In this watershed "high priority" waters include Apple Branch, Brennan Creek, Dougherty Creek, Erickson Creek, Mud Branch, Sawmill Creek, and Whiteside Creek in addition to existing wetlands. These creeks have the highest potential to respond to streambank erosion control and habitat improvement measures. These creeks also have a high potential to receive public use.

Easements to allow the establishment of permanent vegetative cover in these subwatersheds will be considered even though other lower cost practices, such as changes in crop rotation, reduced tillage, contour plowing, or contour strips may provide an adequate level of control. Easements in these areas will also be considered as a cost-effective alternative to more expensive practices such as cropland terraces or agricultural sedimentation basins.

2. Other Portions of the Watershed: Easements may also be used to support critical area stabilization and shoreline buffers in other portions of the watershed, although additional restrictions apply.

   In these areas, the easement must offer pollution control at a cost that is competitive with that of other controls, as required by NR 120. For example, the easement should be lower or similar in cost to expensive practices (such as terraces or agricultural sediment basins) for continuous row crops where the only other alternative is retiring the land.

   Easements may not be purchased with program funds to establish shoreline protection or critical area stabilization practices outside high priority areas if significantly lower cost practices (i.e. changes in crop rotation, reduced tillage, contour plowing, or contour strips) provide an adequate level of control.

***Easements to Support Wetland Restoration***: Easements may be used to support eligible wetland restoration projects. The cost-effectiveness criterion for using wetland restoration is relaxed everywhere in the watershed, being similar to the criterion for easements for shoreline buffers and critical area stabilization in areas adjacent to "high priority waters".

If wetland restoration does not involve the purchase of an easement, then the LCD may sign a cost-share agreement for the required costs and proceed to implement the practice.

***Estimated Need for Easements***: The estimated number of acres needed to control targeted pollution sources located adjacent to "high priority waters" is shown in Chapter V. No estimate is available for other easement needs.

## ORDINANCES

### MANURE STORAGE ORDINANCE

Green and Lafayette Counties are to enact a manure storage ordinance which implements requirements outlined in Chapter 92.16 Wisconsin Statutes by DATCP. This ordinance will be required for grant eligibility. Green County developed a draft ordinance that is in the review process. Lafayette County is expected to begin drafting a manure storage ordinance soon after the approval of the Green County ordinance.

Green and Lafayette Counties are to administer ordinances. These ordinances need to be developed before the end of the project period.

### CONSTRUCTION SITE EROSION ORDINANCE

Green and Lafayette counties have researched the significance of nonpoint source pollution from construction site erosion. Data was collected on the number of building permits issued per year, both within the county and within the watershed. The number of permits issued in the watershed area of both counties is low--an average of four permits per year. Population trends over the past decade were reviewed and the population is declining in all towns and villages with the exception of Argyle. In light of this information, the DNR, strongly suggests that Green and Lafayette Counties pass an ordinance for preventative reasons. However, review of existing data reveals that construction sites do not represent a significant pollutant source in the project area at this time to warrant requiring an ordinance for grant eligibility.

The DNR will require the county to submit an annual review of building permits and population trends. If these data indicate water quality impacts to have the potential to interfere with the goals of this plan, a construction site erosion control ordinance will be required at that time.

The DNR suggests that the Wisconsin Construction Site Erosion Best Management Handbook (DNR Publication WR-222-89) be used as a reference for any development that does occur in Green and Lafayette Counties.

# PART TWO

## DETAILED PROGRAM FOR IMPLEMENTATION

CHAPTER V: DETAILED PROGRAM FOR IMPLEMENTATION
CHAPTER VI: INFORMATION AND EDUCATION PROGRAM
CHAPTER VII: INTEGRATED RESOURCE MANAGEMENT PROGRAM

# CHAPTER V
# DETAILED PROGRAM FOR IMPLEMENTATION

## INTRODUCTION

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

More specifically this chapter identifies:

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

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

3. The cost-share budget.

4. The cost containment policies.

5. The cost-share agreement reimbursement procedures including administrative procedures for carrying out the project.

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

7. Schedules for implementing the project.

8. The involvement of other programs.

9. The project budget including the expense for cost-sharing, and staffing for technical assistance, administration and the information and education program.

## PRIORITY WATERSHED PROJECT PARTICIPANTS: ROLES AND RESPONSIBILITIES

### LANDOWNERS AND LAND OPERATORS

Owners and operators of public and private lands are important participants in the priority watershed program. They will adopt BMPs that reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources. Landowners and land operators in the Lower East Branch Pecatonica Watershed eligible for cost-share assistance through the priority watershed program include: individuals; Green and Lafayette Counties; other governmental units described in NR 120.02(19); corporations; and the state of Wisconsin.

Green and Lafayette Counties are the primary units of government responsible for implementing this plan in rural areas.

The Green and Lafayette County Land Conservation Committees (LCC) will act for the respective County Boards and be responsible contractually and financially to the State of Wisconsin for management of the project in areas with rural land uses. The County LCCs will coordinate the activities of all other local agencies involved with the rural portion of the project.

The specific responsibilities for these counties are defined in the Wisconsin Administrative Rules, s. NR 120.04, and are summarized below:

1. Identify in writing a person to represent the county during implementation of the project.

2. Contact all owners or operators of lands identified as significant nonpoint sources within one year of signing the nonpoint source grant agreement. The counties' strategies for contacting landowners are included in this chapter.

3. Develop farm conservation plans consistent with the needs of the project.

4. Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and conditions of cost-share agreements as defined in s. NR 120.13, Wisconsin Administrative Code.

5. For lands the county owns or operates, to enter into cost-share agreements with DNR to correct identified nonpoint sources and fulfill their obligations as a cost-share recipient.

6. Design BMPs and verify proper practice installation.

7. Reimburse cost-share recipients for the eligible costs of installing BMPs at the rates consistent with administrative rules and established in this plan.

8. Prepare and submit annual work plans for activities necessary to implement the project. The Green and Lafayette County LCDs shall submit a workload analysis and grant application to the Department of Agriculture, Trade and Consumer Protection (DATCP) as required in s. Ag. 166.50.

9. Prepare and submit to the DNR and the DATCP the annual resource management report. This report is required under s. NR 120.21(7) to monitor project implementation by tracking changes in the nonpoint source inventory, and quantifying pollutant load reductions which result from installing BMPs.

10. Participate in the annual watershed project review meeting.

11. Conduct the information and education activities identified in this plan for which they are responsible.

12. Consult with DNR's wildlife management and fisheries management staff to optimize the wildlife and fish management benefits of nonpoint source control BMPs. Specifically, the county staff will contact DNR staff if:

    * Streambank protection practices, agricultural sediment basins, or critical area stabilization practices are being considered.

    * Fence rows, hedgerows, wetlands, or other wildlife habitat components will be adversely affected by installation of agricultural BMPs.

    The DNR staff will assist county staff by:

    * Identifying streambank protection practices that benefit fish and wildlife.

    * Identifying wildlife habitat components that could be incorporated into vegetative filter strips along streams or in upland areas.

    * Reviewing placement of agricultural sediment basins to assure that negative impacts on stream fish and aquatic life do not occur and recommending wildlife habitat components.

    * Providing technical assistance when the installation of BMPs will require the removal of obstructions or other wildlife habitat by proposing measures to minimize impact or mitigate the loss of wildlife habitat.

    * Assisting to resolve questions concerning effects of agricultural nonpoint source BMPs on wetlands.

## DEPARTMENT OF NATURAL RESOURCES

The role of the Department of Natural Resources (DNR) is identified in s. 144.24, Stats. and s. NR 120, Wis. Adm. Code. (NR 120) The DNR has been statutorily assigned the overall administrative responsibility for the Wisconsin Nonpoint Source Pollution Abatement Program. The DNR's role is summarized below.

***Project Administration.*** Project administration includes working with the counties to ensure work commitments, which were required during the eight-year project implementation phase, can be met. The DNR will participate in the annual work planning process with the county.

The DNR reviews cost-share agreements signed by the county and the participating landowners for installing BMPs. The DNR provides guidance when questions arise concerning the conformance of proposed activities with the statutes, administrative rules, and the watershed plan.

***Financial Support.*** Financial support for implementation of the priority watershed project is provided to each county in two ways; a local assistance grant agreement, and a nonpoint source grant agreement. These agreements are described later in this chapter.

The DNR may also enter into cost-share agreements directly with local or state units of government for the control of pollution sources on land the governments own or operate.

***Project Evaluation.*** The DNR has responsibility for priority watershed project monitoring and evaluation activities. These efforts determine if changes in water quality occur as BMPs and other pollution controls are installed or implemented. The water quality evaluation and monitoring strategy for the Lower East Branch Pecatonica Watershed are included in Chapter VIII. The DNR documents the results of monitoring and evaluation activities in interim and final priority watershed project reports.

***Technical Assistance.*** The DNR provides technical assistance to the county on the design and application of BMPs.

***Other Responsibilities.*** These include:

1. Assisting county staff with site reviews to determine the impacts of nonpoint sources on wetlands and/or groundwater quality.

2. Assisting county staff to integrate wildlife and fish management concerns into selection and design of BMPs.

## DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

The role of the Department of Agriculture, Trade and Consumer Protection (DATCP) is identified in s. 144.25, stats., ch. 92 stats., and NR 120. In summary, the DATCP will:

1. Manage a training program for the staff involved with project implementation.

2. Cooperate with the University of Wisconsin - Extension to act as a clearinghouse for information related to agricultural BMPs, sustainable agriculture, and nutrient and pest management.

3. Assist the counties to carry out the information and education activities or tasks described in this plan.

4. Assist county staff to identify watershed participants subject to federal or state conservation compliance programs.

5. Assist counties, if requested, to develop a manure storage ordinance.

6. Assist county staff to complete annual workload analyses and grant applications for work conducted under the priority watershed project.

7. Participate in the annual project review meetings.

8. If the need arises, assist in developing technical standards for agricultural BMPs, and provide technical assistance to county staff concerning application of these practices.

9. Assist county staff to evaluate the site specific practicality of implementing rural BMPs.

## OTHER AGENCIES

The Lower East Branch Pecatonica River Priority Watershed Project will receive assistance from the agencies listed below.

***Soil Conservation Service (SCS).*** This agency works through the local LCC to provide technical assistance for planning and installing conservation practices. The local SCS personnel will work with the county staff to provide assistance with technical work. Personnel from the Area SCS office will provide staff training and engineering assistance for BMPs. The DATCP will make efforts to assist SCS in coordinating the Lower East Branch Pecatonica Watershed Project with the conservation compliance and other conservation provisions of the 1985 and subsequent Federal Farm Bills.

***University of Wisconsin Extension (UWEX).*** County and Area Extension agents will provide support in developing and conducting a public information and education program, which aim at increasing voluntary participation in the project. This will include assistance to carry out the information and education activities identified in this plan.

***Agricultural Stabilization and Conservation Service (ASCS).*** ASCS administers most of the federal programs aimed at the stabilization of the prices paid producers for agricultural products and administers federal funds for rural soil and water and other

resource conservation activities. The Agricultural Conservation Program (ACP), which is administered by ASCS, will be coordinated with the watershed project to the best extent possible. In addition, other conservation incentives such as the Conservation Reserve Program (CRP) will be used whenever possible to control critical nonpoint sources of pollution.

## AGRICULTURAL BEST MANAGEMENT PRACTICES (BMPs)

### BMPs ELIGIBLE FOR COST-SHARING AND THEIR RATES

Best management practices are those practices identified in NR 120 which are determined in this watershed plan to be the most effective controls of the nonpoint sources of pollution. The practices eligible for cost-sharing under the Lower East Branch Pecatonica River Priority Watershed Project are listed in Table 14. The cost-share rates for each BMP are in the table below.

Design and installation of all BMPs must meet the conditions listed in NR 120. Generally, these practices use specific standard specifications included in the SCS Field Office Technical Guide. In some cases additional specifications may apply. The applicable specifications for each BMP can be found in NR 120.14.

The following is a brief description of some of the most commonly used cost-shared BMPs. A more detailed description of these practices can be found in NR 120.14.

1. ***Contour Farming:*** the farming of sloped land so that all operations from seedbed preparation to harvest are done on the contour.

2. ***Contour and Field Stripcropping:*** the growing of crops in a systematic arrangement, usually on the contour, in alternate strips of close grown crops, such as grasses or legumes, and tilled row crops.

3. ***Reduced Tillage:*** a system which leaves a roughened surface or substantial amounts of crop residue in or on the soil surface after crops are planted. The system consists of no more then one primary tillage pass in the fall or spring and no more than two passes with light or secondary tillage equipment prior to planting. It is utilized for continuous row crops or long corn rotations.

4. ***Critical Area Stabilization:*** the planting of suitable vegetation on critical nonpoint source sites.

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

**TABLE 14. State Cost-share Rates for Best Management Practices**

| 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 | 50% (1.)* |
| Critical Area Stabilization | 70% (2.) |
| Grade Stabilization Structures | 70% |
| Agricultural Sediment Basins | 70% |
| Shoreline and Streambank Stabilization | 70% |
| Shoreline Buffers | 70% (2.) |
| Barnyard Runoff Management | 70% |
| Animal Lot Relocation | 70% |
| Manure Storage Facilities | 70% ** |
| Livestock Exclusion from Woodlots | 50% |
| Wetland Restoration | 70% (2.) |
| Roofs for Barnyard Runoff Management and Manure Storage Facilities | 70% |
| Nutrient and Pesticide Management | 50% (3.) |

1. Flat rates for these BMPs can be found in Table 18.

2. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs. See Chapter IV for where easements may 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 amount is $10,000 including no more than $5,000 for manure transfer equipment

6. ***Grade Stabilization Structure:*** a structure used to reduce the grade in a channel to protect the channel from erosion or to prevent the formation or advancement of gullies.

7. ***Livestock Exclusion from Woodlots:*** the exclusion of livestock from woodlots to protect the woodlots from grazing by fencing or other means.

8. ***Shoreline and Streambank Stabilization:*** the stabilization and protection of stream and lake banks against erosion and the protection of fish habitat and water quality from livestock access. This practice includes streambank fencing.

9. ***Terraces:*** a system of ridges and channels with suitable spacing and constructed on the contour with a suitable grade to prevent erosion in the channel.

10. ***Field Diversions:*** the primary purpose of this practice is to divert water—from areas where it is in excess or where it is doing damage—to where it can be managed more efficiently.

11. ***Barnyard Runoff Management:*** structural measures such as gutters, downspouts, or diversions to redirect surface runoff around the barnyard, and collect, convey and temporarily store runoff from the barnyard. Cattle mounds are eligible for cost sharing if the mounds meet the criteria for eligibility agreed upon by the DATCP, the DNR and the county LCD.

12. ***Manure Storage Facility:*** a structure for manure storage that stores manure for a period of time to reduce the impact of manure as a nonpoint source of pollution. Livestock operations that apply this practice are those where manure is winterspread on fields having a high potential for runoff to lakes, streams and groundwater. The facility is needed to store and properly spread manure according to a management plan.

13. ***Agricultural Sediment Basins:*** a structure designed to reduce the transport of sediment eroded from critical agricultural fields to surface waters and wetlands.

14. ***Shoreline Buffers:*** a permanently vegetated area immediately adjacent to lakes, streams, and wetlands designed and constructed to manage critical nonpoint sources or to filter pollutants from nonpoint sources.

15. ***Animal Lot Relocation:*** relocation of an animal lot from a critical site, such as a floodway, to a suitable site to minimize the amount of pollutants from the lot to surface or groundwater.

16. ***Wetland Restoration:*** the construction of berms or destruction of the function of tile lines or drainage ditches to create conditions suitable for wetland vegetation.

17. ***Roofs for Barnyard Runoff Management and Manure Storage Facilities:*** construction of roofs to prevent rain and snow from contacting manure.

18. ***Nutrient Management:*** the management and crediting of nutrients for the application of manure and commercial fertilizers, and crediting for nutrients from legumes. Management includes the rate, method and timing

of the application of all sources of nutrients to minimize the amount of nutrients entering surface or groundwater.

19. ***Pesticide Management:*** the management of the handling, disposal and application of pesticides, including the rate, method and timing of application to minimize the amount of pesticides entering surface and groundwater.

## BMPs NOT COST SHARED

BMPs that are not cost shared, but which shall be included if necessary in the cost-share agreement to control the nonpoint sources, are listed in NR 120.17. Several examples are included below.

* Practices to be funded through other programs.
* Practices previously installed and necessary to support cost-shared practices.
* Changes in crop rotations and other activities normally and routinely used in growing crops or which have installation costs that can be passed on to potential consumers.
* Changes in location of unconfined manure stacks that involve no capital cost.
* Manure-spreading management.
* Other activities that the DNR determines necessary to achieve the objectives of the watershed project.

## ACTIVITIES AND SOURCES OF POLLUTION NOT ELIGIBLE FOR COST-SHARE ASSISTANCE

Priority watershed cost-share funds cannot be used to control sources of pollution and land management activities specifically listed in NR 120.10(2). The following is a partial list of ineligible activities most often inquired about for cost-sharing in rural areas.

* Operation and maintenance of cost-shared BMPs.
* Actions which have drainage of land or clearing of land as the primary objective.
* Practices already installed.
* Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) Program or covered in other ways by Chapter 147 of

Wis. Stats. (including livestock operations with more than 1,000 animal units, or livestock operations issued a notice of discharge under ch. NR 243).

* Septic system controls or maintenance.

* Dredging activities.

* Silvicultural activities.

* Bulk storage of fertilizers and pesticides.

* Activities and structures intended primarily for flood control.

* Practices required to control sources which were adequately controlled at the time the cost-share agreement was signed.

* Other practices or activities determined by the DNR not to meet the objectives of the program.

## COST-SHARE BUDGET

### COSTS OF INSTALLING BMPs

The quantity and type of management practices that are required to meet this project's water quality objectives are listed in Tables 15, 16, and 17. The capital cost of installing the BMPs are listed in this table assuming landowner participation rates of 100 percent and 75 percent. Also included are the units of measurement and cost share amount per unit for the various BMPs.

The capital cost of installing the BMPs in Green and Lafayette Counties is approximately $2.9 million and $3.4 million dollars, respectively, assuming 100 percent participation.

* State funds necessary to cost-share this level of control would be about $1.9 million and $2.2 million for Green and Lafayette Counties, respectively.

* The local share that landowners and other cost-share recipients provide would be about $0.8 million and $1.0 million, respectively.

At a 75 percent level of participation, the state funds needed to cover capital installation is estimated at about $1.4 million and $1.7 million for Green and Lafayette Counties, respectively.

## Table 15. Cost-Share Budget Needs for Rural Management Practices in the Lower East Branch Pecatonica Watershed

| Management Needs | Number | Cost/Unit | Total Cost (1) | 100% Participation State Share | 100% Participation Local Share | 75% Participation State Share | 75% Participation Local Share |
|---|---|---|---|---|---|---|---|
| *Best Management Practices | | | | | | | |
| Upland Sediment Control | | | | | | | |
| Change in Crop Rotation | 12,600 ac | NA(3) | 0 | 0 | 0 | 0 | 0 |
| Contour Cropping | 2,700 ac | $6 | 16,200 | 16,200 | (2) | 12,150 | (2) |
| Contour Strip Cropping | 7,200 ac | $12 | 86,400 | 86,400 | (2) | 64,800 | (2) |
| Reduced Tillage (4) | 3,600 ac | $45 | 162,000 | 162,000 | (2) | 121,500 | (2) |
| Critical Area Stabilization | 900 ac | $275 | 247,500 | 173,250 | 74,250 | 129,938 | 55,688 |
| Grass Waterways | 150 ac | $1,175 | 176,250 | 123,375 | 52,875 | 92,531 | 39,656 |
| Field Diversions & Terraces | 25,000 ft | $3 | 68,750 | 48,125 | 20,625 | 36,094 | 15,469 |
| Grand Stabilization | 40 ea | $3,000 | 120,000 | 84,000 | 36,000 | 63,000 | 27,000 |
| Agricultural Sediment Basin | 8 ea | $3,000 | 24,000 | 16,800 | 7,200 | 12,600 | 5,400 |
| Woodlot Fencing | 6,400 rod | $10 | 64,000 | 44,800 | 19,200 | 33,600 | 14,400 |
| Shoreline Buffers(5) | 400 ac | $250 | 100,000 | 70,000 | 30,000 | 52,500 | 22,500 |
| Wetland Restoration | 121 ea | $500 | 60,500 | 42,350 | 18,150 | 31,763 | 13,613 |
| Animal Waste Management | | | | | | | |
| Barnyard Runoff Control | | | | | | | |
| Complete System | 77 ea | $22,500 | 1,732,500 | 1,212,750 | 519,750 | 909,750 | 389,813 |
| Clean Water Diversion | 58 ea | $4,000 | 232,000 | 162,400 | 69,600 | 121,800 | 52,200 |
| Manure Storage Facility (6) | 50 ea | $25,000 | 1,250,000 | 500,000 | 375,000 | 375,000 | 281,250 |
| Manure Spreading Management | 4,795 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Streambank Erosion Control | | | | | | | |
| Pasture Management | 5000 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Shape and Seeding | 108,125 ft | $3 | 324,375 | 227,063 | 97,313 | 170,297 | 72,984 |
| Fencing | 11,385 rod | $10 | 113,850 | 79,695 | 34,155 | 59,771 | 25,616 |
| Rip-Rap | 118,400 ft | $12 | 1,420,800 | 994,560 | 426,240 | 745,920 | 319,680 |
| Livestock/Machinery | | | | | | | |
| Crossing | 64 ea | $1,150 | 73,600 | 51,520 | 22,080 | 38,640 | 16,560 |
| TOTALS: | | | $6,272,725 | $4,095,288 | $1,802,438 | $3,071,466 | $1,351,828 |
| *Easements | 1,196 ac | $400 | 478,400 | 478,400 | 0 | 358,800 | 0 |
| TOTALS: | | | $6,751,125 | $4,573,688 | $1,802,438 | $3,430,266 | $1,351,828 |

(1) Total Cost to control identified critical pollution sources.
(2) Local share consists of labor and any additional equipment costs.
(3) NA means that cost share funds are not available for this practice.
(4) This practice is reduced tillage, including no-till, for continuous row crops.
(5) Shoreline Buffer practice needs will be determined during implementation.
(6) Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

## Table 16. Cost-Share Budget Needs for Rural Management Practices in Green County

| Management Needs | Number | Cost/Unit | Total Cost (1) | 100% Participation State Share | 100% Participation Local Share | 75% Participation State Share | 75% Participation Local Share |
|---|---|---|---|---|---|---|---|
| *Best Management Practices | | | | | | | |
| Upland Sediment Control | | | | | | | |
| Change in Crop Rotation | 5,600 ac | NA(3) | 0 | 0 | 0 | 0 | 0 |
| Contour Cropping | 1,200 ac | $6 | 7,200 | 7,200 | (2) | 5,400 | (2) |
| Contour Strip Cropping | 3,200 ac | $12 | 38,400 | 38,400 | (2) | 28,800 | (2) |
| Reduced Tillage (4) | 1,600 ac | $45 | 72,000 | 72,000 | (2) | 54,000 | (2) |
| Critical Area Stabilization | 400 ac | $275 | 110,000 | 77,000 | 33,000 | 57,750 | 24,750 |
| Grass Waterways | 65 ac | $1,175 | 76,375 | 53,463 | 22,913 | 40,097 | 17,184 |
| Field Diversions & Terraces | 11,000 ft | $3 | 30,250 | 21,175 | 9,075 | 15,881 | 6,806 |
| Grand Stabilization | 18 ea | $3,000 | 54,000 | 37,800 | 16,200 | 28,350 | 12,150 |
| Agricultural Sediment Basin | 4 ea | $3,000 | 12,000 | 8,400 | 3,600 | 6,300 | 2,700 |
| Woodlot Fencing | 2,800 rod | $10 | 28,800 | 20,160 | 8,640 | 15,120 | 6,480 |
| Shoreline Buffers(5) | 250 ac | $250 | 62,500 | 43,750 | 18,750 | 32,813 | 14,063 |
| Wetland Restoration | 44 ea | $500 | 22,000 | 15,400 | 6,600 | 11,550 | 4,950 |
| Animal Waste Management | | | | | | | |
| Barnyard Runoff Control | | | | | | | |
| Complete System | 31 ea | $22,500 | 697,500 | 488,250 | 209,250 | 366,188 | 156,938 |
| Clean Water Diversion | 21 ea | $4,000 | 84,000 | 58,800 | 25,200 | 44,100 | 18,900 |
| Manure Storage Facility (6) | 23 ea | $25,000 | 575,000 | 230,000 | 172,500 | 172,500 | 129,375 |
| Manure Spreading Management | 2,100 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Streambank Erosion Control | | | | | | | |
| Pasture Management | 2,200 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Shape and Seeding | 60,850 ft | $3 | 182,550 | 127,785 | 54,765 | 95,839 | 41,074 |
| Fencing | 2,335 rod | $10 | 23,350 | 16,345 | 7,005 | 12,259 | 5,254 |
| Rip-Rap | 64,700 ft | $12 | 776,400 | 543,480 | 232,920 | 407,610 | 174,690 |
| Livestock/Machinery | | | | | | | |
| Crossing | 30 ea | $1,150 | 34,500 | 24,150 | 10,350 | 18,113 | 7,763 |
| SUBTOTALS: | | | $2,886,825 | $1,883,558 | $830,768 | $1,412,668 | $623,076 |
| *Easements | 431 ac | $400 | 172,400 | 172,400 | 0 | 129,300 | 0 |
| TOTALS: | | | $3,059,225 | $2,055,958 | $830,768 | $1,541,968 | $623,076 |

(1) Total Cost to control identified critical pollution sources.
(2) Local share consists of labor and any additional equipment costs.
(3) NA means that cost share funds are not available for this practice.
(4) This practice is reduced tillage, including no-till, for continuous row crops.
(5) Shoreline Buffer practice needs will be determined during implementation.
(6) Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

## Table 17. Cost-Share Budget Needs for Rural Management Practices in Lafayette County

| Management Needs | Number | Cost/Unit | Total Cost (1) | 100% Participation State Share | 100% Participation Local Share | 75% Participation State Share | 75% Participation Local Share |
|---|---|---|---|---|---|---|---|
| *Best Management Practices | | | | | | | |
| Upland Sediment Control | | | | | | | |
| Change in Crop Rotation | 7,000 ac | NA(3) | 0 | 0 | 0 | 0 | 0 |
| Contour Cropping | 1,500 ac | $6 | 9,000 | 9,000 | (2) | 6,750 | (2) |
| Contour Strip Cropping | 4,000 ac | $12 | 48,000 | 48,000 | (2) | 36,000 | (2) |
| Reduced Tillage (4) | 2,000 ac | $45 | 90,000 | 90,000 | (2) | 67,500 | (2) |
| Critical Area Stabilization | 500 ac | $275 | 137,500 | 96,250 | 41,250 | 72,188 | 30,938 |
| Grass Waterways | 85 ac | $1,175 | 99,875 | 69,913 | 29,963 | 52,434 | 22,472 |
| Field Diversions & Terraces | 14,000 ft | $3 | 38,500 | 26,950 | 11,550 | 20,213 | 8,663 |
| Grand Stabilization | 22 ea | $3,000 | 66,000 | 46,200 | 19,800 | 34,650 | 14,850 |
| Agricultural Sediment Basin | 4 ea | $3,000 | 12,000 | 8,400 | 3,600 | 6,300 | 2,700 |
| Woodlot Fencing | 3,520 rod | $10 | 35,200 | 24,640 | 10,560 | 18,480 | 7,920 |
| Shoreline Buffers(5) | 150 ac | $250 | 37,500 | 26,250 | 11,250 | 19,688 | 8,438 |
| Wetland Restoration | 77 ea | $500 | 38,500 | 26,950 | 11,550 | 20,213 | 8,663 |
| Animal Waste Management | | | | | | | |
| Barnyard Runoff Control | | | | | | | |
| Complete System | 46 ea | $22,500 | 1,035,000 | 724,500 | 310,500 | 543,375 | 232,875 |
| Clean Water Diversion | 37 ea | $4,000 | 148,000 | 103,600 | 44,400 | 77,700 | 33,300 |
| Manure Storage Facility (6) | 27 ea | $25,000 | 675,000 | 270,000 | 202,500 | 202,500 | 151,875 |
| Manure Spreading Management | 2,695 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Streambank Erosion Control | | | | | | | |
| Pasture Management | 2,800 ac | NA | 0 | 0 | 0 | 0 | 0 |
| Shape and Seeding | 47,275 ft | $3 | 141,825 | 99,278 | 42,548 | 74,458 | 31,911 |
| Fencing | 9,050 ft | $10 | 90,500 | 63,350 | 27,150 | 47,513 | 20,363 |
| Rip-Rap | 53,700 ft | $12 | 644,400 | 451,080 | 193,320 | 338,310 | 144,990 |
| Livestock/Machinery | | | | | | | |
| Crossing | 34 ea | $1,150 | 39,100 | 27,370 | 11,730 | 20,528 | 8,798 |
| SUBTOTALS: | | | $3,385,900 | $2,211,730 | $971,670 | $1,658,798 | $728,753 |
| *Easements | 765 ac | $400 | 306,000 | 306,000 | 0 | 229,500 | 0 |
| TOTALS: | | | $3,691,900 | $2,517,730 | $971,670 | $1,888,298 | $728,753 |

(1) Total Cost to control identified critical pollution sources.
(2) Local share consists of labor and any additional equipment costs.
(3) NA means that cost share funds are not available for this practice.
(4) This practice is reduced tillage, including no-till, for continuous row crops.
(5) Shoreline Buffer practice needs will be determined during implementation.
(6) Maximum cost-share is $10,000 of which a maximum of $5,000 can be for waste transfer.

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

### EASEMENT COSTS

Chapter IV identifies where nonpoint source program funds can be used to purchase easements. The estimated cost to purchase easements on eligible lands in Green and Lafayette Counties is shown in Tables 15, 16, and 17. At 100 percent participation, the estimated purchase price of easements on eligible lands would be$117,400 and $306,000 in Green and Lafayette Counties, respectively. At 75 percent participation, the cost would be $129,300 and $229,500; respectively. The easement costs would be paid entirely by the state.

## COST CONTAINMENT

### COST CONTAINMENT PROVISIONS

The following provisions will be used to control the costs of installing best management practices (BMPs) in the Lower East Branch Pecatonica River Priority Watershed Project.

Practice cost estimates will be based on average unit cost. These average unit costs will be submitted to DNR and DATCP for approval and revised and updated as needed by counties.

Where special circumstances warrant, practice costs may exceed the cost share maximum identified by these provisions. In no case, however, may the amount paid the grantee exceed actual installation cost times the specified cost share rate.

BMPs cost-shared using flat rates are shown in Table 18. The rates shown are the state's share of the practice installation cost.

Table 18. 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. |
| Fencing . . . . . | $10.00/rod. |
| Reduced Tillage . . . . . | $45.00/ac. (1.) |

(1.) Reduced tillage systems for continuous row cropping or long rotations (includes no-till).

BMPs estimated under $5,000 will be bid only at the discretion of the project manager. Bidding will be required for practices estimated at or above $5,000. The Land

Conservation Department must approve the selected bid. If no bids are received or if the selected bid is deemed not appropriate, the cost-share payment will be based on the practice's cost estimate.

Cost-share payments will be based on the cost that the LCD approved prior to construction initiation. If installation costs exceed the approved cost for the practice, the amount paid the grantee may be increased with the approval of the appropriate LCD. Documentation regarding the need for changes will be submitted as required.

Payments for "In Kind" contributions will be based on each county's guidelines. Cost-share recipients who wish to install a BMP using their own labor, materials, and equipment must submit a bid plus one bid from a qualified contractor for the practice installation.

The Wisconsin Conservation Corps may be used to install BMPs for cost-share recipients.

## COST-SHARE AGREEMENT REIMBURSEMENT PROCEDURES

### NONPOINT SOURCE GRANT AGREEMENT AND ADMINISTRATION

***General Information.*** The Nonpoint Source Grant Agreement is the means for transmitting funds from the DNR (through the nonpoint source program) to Green and Lafayette Counties for use in funding the state's share of cost-share agreements. Cost-share agreements are the means to transmit funds from the counties to the landowners.

A portion of the Nonpoint Source Grant is forwarded to Green and Lafayette Counties to allow the county to set up an "up front" account. The county uses the funds from this account to pay landowners after practices are installed under the project. As this account is drawn down, the county will request reimbursements from the DNR to replenish the account. The counties will submit reimbursement requests on a quarterly basis. This reimbursement schedule will insure that the "up front" account balance is maintained at an adequate level. The Nonpoint Source Grant Agreement will be amended annually to provide funding needed for cost sharing for the year. The funds obligated under cost-share agreements must never exceed the total funds in the grant agreement.

***Fiscal Management Procedures, Reporting Requirements.*** NR 120 requires counties to maintain a financial management system that accurately tracks the disbursement of all funds used for the Lower East Pecatonica River Priority Watershed Project. The records of all watershed transactions must be retained for three years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26.

## COST-SHARE AGREEMENT AND ADMINISTRATION

***Purpose and Responsibilities.*** Consistent with s. 144.25, Stats. and NR 120, Wis. Adm. Code, cost-share funding is available to landowners for a percent of the costs of installing BMPs to meet the project objectives. Landowners have three years after formal approval of the watershed plan to enter into cost-share agreements. Practices included on cost-share agreements must be installed within the schedule agreed to on the cost-share agreement. Unless otherwise approved, the schedule of installing BMPs will be within five years of signing the cost-share agreement. Practices must be maintained for a minimum of ten years from the date of installing the final practice included in the cost-share agreement.

The cost-share agreement is a legal contract between the landowner and the county. The agreement includes the name and other information about the landowner and grant recipient, conditions of the agreement, the practices involved and their location, the quantities and units of measurement involved, the estimated total cost, the cost-share rate and amount, the timetable for installation, and number of years the practice must be maintained. The agreements also identify and provide information on practices not cost-shared through the nonpoint program but that are essential to controlling pollution sources (such as crop rotations). Once both parties sign the agreement, they are legally bound to carry out the provisions in it.

If land ownership changes, the cost-share agreement remains with the property and the new owner is legally bound to carry out the provisions. NR 120.13(9) and (10) has more information on changes of land ownership and the recording of cost-share agreements.

Local, state, or federal permits may be needed prior to installation of some BMPs. The areas most likely to need permits are zoned wetlands and the shoreline areas of lakes and streams. These permits are needed whether the activity is a part of the watershed project or not. Landowners should consult with the County Planning and Zoning Department or the LCD offices to determine if any permits are required. The landowner is responsible for acquiring the needed permits prior to installation of practices.

The cost-share agreement binds the county to provide the technical assistance needed for the planning, design, and verification of the practices on the agreement, and to provide the cost-share portion of the practice costs.

Counties are responsible for enforcing compliance of cost-share agreements to which they are a party. Where DNR serves as a party to an agreement with a unit of government, the DNR will take responsibility for monitoring compliance. The responsible party will insure that BMPs installed through the program are maintained in accordance with the operation and maintenance plan for the practice for the appropriate length of time. Green and Lafayette Counties will check for compliance with practice maintenance provisions once every three years after the last practice has been installed. The county must check maintenance at its own expense after the Nonpoint Source Agreement has lapsed.

***Landowner Contact Strategy.*** The following procedure will be used to make landowner contacts.

1. During the first three months of the implementation period, the county will send all landowners or operators with eligible nonpoint sources of pollution a mailing explaining the priority watershed project and how they can become involved.

2. After the initial landowner mailings, county staff will make personal contacts with all landowners that have been identified as having critical nonpoint sources of pollution (Management Category I). These contacts will occur within a year of receiving the Nonpoint Source Agreement.

3. The county will continue to make contacts with eligible (Management Category I and II) landowners and operators until they make a definite decision regarding participation in the program.

4. The county will contact all eligible landowners (as defined in (3) above) who do not sign cost-share agreements by personal letter six months prior to the end of the sign-up period.

***Procedure for Developing a Cost-Share Agreement.*** Eligibility for cost-sharing is verified following a site visit, using the criteria described in Chapter IV.

The development of farm conservation plans will be the primary method used to develop cost-share agreements. These plans are specific to a particular landowner and are a comprehensive approach to the abatement of the nonpoint sources of pollution, and the conservation of soil and other resources. The farm plan takes into consideration the sustainability of the agricultural resources and the management decisions of the owner or operator.

Landowners, who spread livestock manure on critical acres (defined in Chapter IV) during the winter and are in Management Category I, will have a manure spreading plan developed for their livestock operation if they elect to participate in the program. Landowners in Management Category II may have a spreading plan developed. Participants in the watershed project will be required to limit winterspreading of livestock manure in accordance with the criteria listed in Chapter IV.

If manure storage facilities are cost shared a manure-spreading plan is required. The plan will not allow winterspreading of manure on any critical acres for landowners receiving cost sharing for manure storage facilities.

The cost-share agreement specifies the items listed in the farm conservation plan that are necessary to reduce the nonpoint sources of pollution. The conservation plan and cost-share agreement will document existing management that must be maintained to protect water quality.

The county will use the following procedure for developing and administering agreements. Below are the steps from the initial landowner contact through the completion of BMP maintenance.

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

2. Landowner agrees to participate with the watershed project.

3. The county prepares a farm conservation plan.

4. The landowner agrees with the plan, a Cost-Share Agreement is prepared, and the landowner and county sign both documents. Two copies of the Cost-Share Agreement (CSA) are sent to the DNR Southern District Nonpoint Source Coordinator and a copy given to the landowner. The county will record the CSA with the county register of deeds.

5. The county or their designee designs the practices, and a copy of the design is provided to the landowner.

6. The landowner obtains the necessary bids or other information required in the cost containment policy.

7. Amendments to the CSA are made if necessary.

8. The county staff oversee practice installation.

9. The county verifies the installation.

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

11. LCC and, if required, county boards, approve cost-share payments to landowners.

12. The county issues checks to the respective landowners, and project ledgers are updated.

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

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

***Submittal to the DNR.*** Cost-share agreements do not need prior approval from the DNR, except in the following instances:

* Where cost-share funds are to be used for practices on county-owned or controlled land.

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

* For grade stabilization structures and agricultural sediment basins with embankment heights between 15 and 25 feet and impoundment capacities of 15 to 50 acre feet.

* For streambanks to be controlled using riprap or other materials with banks over six feet high.
* For animal lot relocation.

* For roofs over barnyards or manure storage facilities.

## LOCAL ASSISTANCE GRANT AGREEMENT ADMINISTRATION

***General Information.*** The Local Assistance Grant Agreement (LAGA) is a grant from the DNR to Green and Lafayette Counties for supporting their staffing and support costs of carrying out this watershed plan. Each county will have its own agreement. Consistent with NR 120, the counties will use funds from the LAGA for additional staff to implement the project and conduct information and education activities. The LAGA also supports other items such as travel, training, and certain office supplies. Further clarification of eligible costs which this grant supports is given in NR 120.14(4) and (6).

***Grant Agreement Application Procedures.*** An annual review of the Local Assistance Grant Agreement is conducted through the development of an annual workload by the county. This workload estimates the work needed to be accomplished each year. The workload is provided to the DATCP and the DNR for review and clarification. Along with the workload analysis, a grant application form is sent. Funds needed to complete the agreed upon annual workload are amended to the local assistance grant agreement.

***Fiscal Management Procedures, Reporting Requirements.*** NR 120 requires Green and Lafayette Counties to maintain a financial management system that accurately tracks the disbursement of all funds used for the Lower East Branch Pecatonica Watershed Project. The records of all watershed transactions must be retained for three years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26.

NR 120 requires quarterly reports to the DATCP from each county in accordance with s. Ag. 166.40(4) accounting for staff time, expenditures, and accomplishments regarding activities funded through the watershed project. Reimbursement requests may be included with the submittal of the quarterly project reports.

***Administration of Easements.*** Easements shall be for a period of no less than 20 years, although perpetual easements are preferred. The easement will be developed as an agreement separate from the cost-sharing agreement for the BMPs.

Easements may be contracts between the landowner and the DNR, or between the landowner and the local unit of government. The local unit of government will retain

responsibility for identifying how the easement will be used in controlling targeted pollution sources. Final approval of the easement rests with the DNR's Bureau of Water Resources Management.

To initiate the process, the local unit of government shall fill out an appraisal request form and forward it to the DNR district nonpoint source coordinator. The nonpoint source coordinator will be responsible for obtaining review comments from local DNR staff including those from the Bureaus of Wildlife Management, Fish Management, and Water Regulation and Zoning. The nonpoint source coordinator will then forward the proposal to DNR bureau and district personnel of Water Resources Management, Property Management, and other disciplines as appropriate.

## STAFFING NEEDS

### BUDGET AND STAFFING NEEDS

This section estimates the funding and staffing required to provide technical assistance for the rural portion of this project. These estimates are based on needs identified for Green and Lafayette Counties.

1. Costs of Installing BMPs

   The quantity and type of BMPs that are needed to meet this project's water quality objectives are listed in Tables 15, 16, and 17. The cost of installing the BMPs which are listed in this table assume landowner participation rates of 100 percent and 75 percent. Also included are the units of measurement and cost share amount per unit for the various BMPs.

   The total cost of installing the BMPs in the watershed in order to achieve water quality objectives is approximately $6.3 million dollars. The state funds necessary to cost share this level of control would be about $4.1 million dollars, or about 69 percent of the total. The local share provided by landowners and other cost share recipients would be about $1.8 million dollars, or about 30 percent of the total.

2. Staff Needs

   Table 19 lists the total estimated staff needed to implement the management objectives assuming that 75 percent or 50 percent of eligible BMPs are adopted. A total of approximately 44 staff years (calculated at 1,840 hours per staff year) will be needed to implement this plan at a 75 percent landowner participation rate. Included are the 1.4 staff years required to carry out the information and education program. The estimated total cost for staff for the entire project would be $1.4 million if 75 percent of the significant nonpoint sources are controlled. Counties will hire three staff in Green County and three staff in Lafayette County.

Table 19. Estimated County LCD Staff Needs for Project Implementation

| Activity | Project Years When Work Will Be Done | GREEN COUNTY 75% Landowner Participation (Staff Hours) | GREEN COUNTY 50% Landowner Participation (Staff Hours) | LAFAYETTE COUNTY 75% Landowner Participation (Staff Hours) | LAFAYETTE COUNTY 50% Landowner Participation (Staff Hours) |
|---|---|---|---|---|---|
| Project & Financial Mgmt. | 1-8 | 3,120 | 3,120 | 3,120 | 3,120 |
| Information & Education Program | 1-8 | 2,002 | 2,002 | 2,002 | 2,002 |
| Pre-Contact Office Inventory Landowner Contacts, & Progress Tracking | 1-3 | 1,913 | 1,275 | 2,550 | 1,700 |
| Conservation Planning; Cost Share Agrmt. Development | 1-3 | 5,063 | 3,375 | 6,750 | 4,500 |
| Practice Design & Installation | 1-8 | | | | |
| Upland Sediment Control | | 6,540 | 4,360 | 8,585 | 5,723 |
| Barnyard Runoff Control | | 3,168 | 2,112 | 4,116 | 2,744 |
| Manure Spreading Mgmt. & Storage | | 3,060 | 2,040 | 2,310 | 1,540 |
| Streambank Erosion Control | | 12,290 | 8,193 | 10,334 | 6,890 |
| Training | 1-8 | 1,250 | 1,040 | 1,250 | 1,040 |
| TOTAL LCD WORKLOAD: | | 38,405 | 27,517 | 41,017 | 29,259 |
| Estimated Staff Required for Years 1-3: | | 6,277 per yr | 4,419 per yr | 6,934 per yr | 4,890 per yr |
| Estimated Staff Required for Years 4-8: | | 3,945 per yr | 2,852 per yr | 4,043 per yr | 2,918 per yr |

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

# SCHEDULES

## GRANT DISBURSEMENT AND PROJECT MANAGEMENT SCHEDULE

Implementation may begin upon approval of this watershed plan by the Green County Board; Lafayette County Board; Wisconsin Department of Agriculture, Trade and Consumer Protection; and the Wisconsin Department of Natural Resources. The priority watershed project implementation period lasts eight years. It includes an initial three-year period for contacting eligible landowners and signing cost-share agreements. Practices on any cost-share agreement must be installed within a five-year period.

Under extenuating circumstances, the DNR can extend the initial period for entering into cost-share agreements for a limited period of time if it will result in a significant increase in nonpoint source pollution control. The DNR and the DATCP must also

Table 20. Grant Disbursement Schedule at 75% Landowner Participation Rate for Green County

| Item | Project Year 1 | 2 | 3 | 3-8 |
|---|---|---|---|---|
| Cost-Share Funds: Practices | $282,534 | $565,067 | $565,067 | $0 |
| Cost-Share Funds: Easements | 25,860 | 51,720 | 51,720 | 0 |
| Local Assistance Staff Support | 107,678 | 107,678 | 107,678 | 344,680 |
| Information/Education: Direct | 500 | 500 | 500 | 502 |
| Other Direct: (travel, supplies, etc.) | 20,000 | 20,000 | 20,000 | 40,000 |
| TOTAL | $436,572 | $744,965 | $744,965 | $385,182 |

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

Table 21. Grant Disbursement Schedule at 75% Landowner Participation Rate for Lafayette County

| Item | Project Year 1 | 2 | 3 | 3-8 |
|---|---|---|---|---|
| Cost-Share Funds: Practices | $331,760 | $663,519 | $663,519 | $0 |
| Cost-Share Funds: Easements | 76,500 | 76,500 | 76,500 | 0 |
| Local Assistance Staff Support | 119,903 | 119,903 | 119,903 | 353,411 |
| Information/Education: Direct | 500 | 500 | 500 | 502 |
| Other Direct: (travel, supplies, etc.) | 20,000 | 20,000 | 20,000 | 40,000 |
| TOTAL | 548,663 | $880,423 | $880,423 | $393,913 |

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of: Green and Lafayette Counties

approve limited extensions for the installation period for practices on individual cost-share agreements.

The disbursement of the grants (Local Assistance and Nonpoint Source) to Green and Lafayette counties will be based on an annual workload analysis and grant application process. The estimated grant disbursement schedule based on 75 percent participation by eligible landowners can be found in Tables 20 and 21; for the entire watershed, Green County, and Lafayette County, respectively.

## INVOLVEMENT OF OTHER PROGRAMS

### COORDINATION WITH STATE AND FEDERAL CONSERVATION COMPLIANCE PROGRAMS

The Lower East Branch Pecatonica River Priority Watershed Project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by the DATCP, and the Federal Food Security Act (FSA) administered by the Soil Conservation Service. DATCP will assist Green and Lafayette County and the SCS offices to identify landowners within the watershed that are subject to the compliance provisions of FPP and FSA. Conservation Farm Plans were completed for all landowners in FSA on December 31, 1989. Green and Lafayette Counties completed FPP plans in 1988.

There will be a need to implement the conservation plans and in the future amend these plans during the implementation phase of the watershed project. The watershed project-supported staff will revise the conservation plans developed for FPP and FSA to include management decisions and the installation of necessary BMPs for nonpoint source pollution abatement while addressing other resource conservation problems. This comprehensive approach to farm planning will facilitate consideration of the various goals and objectives for all the programs in which the landowner participates.

Some eroding uplands in Management Categories II and II may need control, in addition to that required for meeting sediment delivery targets, in order to meet soil erosion program goals established through other state and federal programs. Where this occurs, technical and financial assistance from the nonpoint source program can be used to support practice design and installation on these critical lands. This assistance applies only where the additional control needed to meet soil erosion goals can be achieved using low cost practices.

## PROJECT BUDGET

### COST-SHARE BUDGET COSTS

The total budget for cost-sharing is shown in Table 22. The capital cost of installing the BMPs in Green and Lafayette Counties is approximately $2.9 million and $3.4 million dollars, respectively, assuming 100 percent participation.

* State funds necessary to cost-share this level of control would be about $1.9 million and $2.2 million for Green and Lafayette Counties, respectively.
* The local share provided by landowners and other cost-share recipients would be about $0.8 million and $1.0 million, respectively.

At a 75 percent level of participation, the state funds needed to cover capital installation would be about $1.4 million and $1.7 million for Green and Lafayette Counties, respectively.

Table 22. Total Project Costs at 75% Landowner Participation Rate

| Item | GREEN COUNTY Costs (State Share) | LAFAYETTE COUNTY Costs (State Share) | WATERSHED Costs (State Share) |
|---|---|---|---|
| Cost-Share Funds: Practices | $1,412,668 | $1,658,798 | $3,071,466 |
| Cost-Share Funds: Easements | $129,300 | $229,500 | $358,800 |
| Local Assistance Staff Support | $667,714 * | $713,121 * | $1,380,835 |
| Information/Education: Direct | $2,002 | $2,002 | $4,004 |
| Other Direct: (travel, supplies, etc.) | $100,000 | $100,000 | $200,000 |
| TOTAL | $2,311,684 | $2,703,421 | $5,015,105 |

* Salary + Indirect = $32,000/year

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection; and Land Conservation Departments of Green and Lafayette Counties.

## EASEMENT COSTS

Chapter IV identifies where nonpoint source program funds can be used to purchase easements. The estimated cost of purchasing easements on eligible lands in Green and Lafayette Counties is shown in Table 15, 16, and 17. At 100 percent participation, the estimated purchase price of easements on eligible lands would be $117,400 and $306,000 in Green and Lafayette Counties, respectively. At 75 percent participation, the cost would be $129,300 and $229,500; respectively. The state would pay entirely for the easement costs.

### STAFFING COSTS

The estimated cost for staff at a 75 percent landowner participation rate is approximately $670,000 and $710,000; respectively, in Green and Lafayette Counties. All of these costs, with the exception of some direct cost items, would be paid for by the state.

## INFORMATION & EDUCATION COSTS

### TOTAL PROJECT COST

The total state funding required to meet the rural nonpoint source pollution control needs at a 75 percent level of landowner participation is presented in Table 22. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated cost to the state would be $2.3 million and $2.7 in Green and Lafayette Counties, respectively.

# CHAPTER VI
# INFORMATION AND EDUCATION PROGRAM

## OBJECTIVES AND GOALS

The Information and Education (I&E) program objectives are to gather support for the Lower East Branch Pecatonica River Priority Watershed Project and to maximize landowner participation in the project.

To achieve its objectives, the I&E program was structured around the following goals:

1. Increased awareness, understanding and appreciation of the water resources in the Lower East Branch Pecatonica River Priority Watershed Project.

2. Increased understanding of the principles of nonpoint source pollution as experienced in the watershed project.

3. Increased awareness and understanding of best management practices (BMPs) that are promoted through the watershed project--including how these practices can lead to cleaner water and improved farm management.

4. Increased awareness and understanding of the purpose, operation and benefits of the watershed project.

## AUDIENCE

The primary audience of the I&E program are priority watershed landowners who are eligible for project participation. Secondary audiences are priority watershed landowners and residents who are not eligible for project participation; suppliers of services to the priority watershed; interest groups; and the general public.

## DELIVERY TEAM

Lafayette County Land Conservation Department and the Green County Land Conservation Department (LCD) will take the lead responsibility for delivering the I&E program along with the University of Wisconsin Cooperative Extension (UWEX), the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP) providing supporting assistance.

## ACTIVITIES

### NEWSLETTERS

***Description***: Newsletters will be a major component of the I&E program for this priority watershed project. During the sign-up period, newsletters will focus on eligibility requirements, BMPs, and the benefits from their application. The implementation period newsletters will focus on the operation and maintenance of BMPs, the water quality improvements resulting from BMP application, and the overall progress in the watershed. In addition, existing publications of agencies such as UWEX and U.S. Agricultural Stabilization and Conservation Service (ASCS) will be used to distribute information on the watershed project.

***Schedule***: Three per year.

### PUBLIC ANNOUNCEMENT SHEETS

***Description***: Fact sheets will be descriptive narratives announcing upcoming events in the watershed, such as tours, public meetings, etc. Demonstration plot results will be distributed through fact sheets.

***Schedule***: As activities occur.

### NEWS RELEASES

***Description***: News releases will be sent to local newspapers. Topics of the news releases will include the purpose and progress of the watershed project.

1. Description of the water resources and the impacts of nonpoint source pollutants in the watershed.
2. Current status of watershed project progress.
3. Explanation of BMPs.
4. Success stories of improved water quality.
5. Bid invitations for demonstrations or large projects.

***Schedule***: Minimum of two releases per year.

## RADIO

***Description***: Radio coverage of project activities and progress will be aired on local stations.

***Schedule***: Minimum of six per year.

## PUBLIC INFORMATION MEETINGS AND PRESENTATIONS

***Description***: A series of public information meetings will be held to cover the following topics:

1. The nature of nonpoint source water pollution and effectiveness of BMPs.
2. Goals and objectives of the watershed plan.
3. Administrative rules of the watershed project, including eligibility and cost sharing.

***Schedule***: Approximately ten meetings will be held throughout the duration of the project.

## ADVISORY COMMITTEE

***Description***: A committee of community leaders, agribusinesses, farm organizations, schools and elected officials formed to provide a local link between the many watershed interests and to advise the counties of landowner concerns.

***Schedule***: Meetings will be held quarterly.

## FIELD DAYS

***Description***: Field days and display areas will be organized at the demonstrations for nutrient and pest management, barnyard runoff control, and manure storage. Watershed tours will be given in both counties to demonstrate BMPs, their maintenance, and to encourage project participation.

***Schedule***: 1992-1993: Two per year.
1993-1999: One every year.

## NUTRIENT/PESTICIDE MANAGEMENT (NPM) DEMONSTRATION PLOT

***Description***: An NPM demonstration plot has been established at two sites in an eight-acre field. One site will operate under the present system of management for nitrogen fertilization and the other site will address manure and soil nitrate credits. Both sites

will address herbicide management with full rates--broadcasted, half rates--broadcasted, full rates--banded, and mechanical practices alone for weed control.

***Schedule***: The plot was established in the spring of 1990 and will be monitored through 1994.

In addition, related Nutrient Pest Management (NPM) information & education materials will be made available to landowners.

## STREAMBANK MANAGEMENT DEMONSTRATION

***Description***: Streambank erosion has been identified as a primary source to be controlled in order to achieve the water resource objectives. A streambank improvement project has been established showing the various measures used to control erosion and enhance fish habitat. These practices demonstrate fencing, a stream crossing, riprap, and lunker structures.

***Schedule***: Construction of this demonstration site was completed by November 1990.

## ANIMAL WASTE MANAGEMENT DEMONSTRATIONS

***Description***: Two sites have been selected for animal waste management demonstrations. One site will address barnyard runoff control and the other will address runoff control and manure storage. At one site, a field day will be held in conjunction with the NPM Demonstration.

***Schedule***: Construction of these demonstrations will start in the spring of 1991.

## SIGNS

***Description***: Watershed boundary and project participation signs will be utilized to increase awareness of project activity:

1. "Working with Farmers and Landowners for Better Water Quality" signs marking project boundaries on major roads.

2. "Lower East Branch Pecatonica Watershed Project Participant" signs for display at each participant's farm.

**SCHEDULE**: Boundary signs will be posted beginning in May 1991. Participation signs will be posted during implementation.

## POSTERS

***Description***: Posters with the Lower East Branch logo will be developed and used for the purpose of announcing upcoming events and meetings. These posters will be displayed at locations within the watershed that are frequented by priority watershed landowners such as agribusinesses, stores and banks.

***Schedule***: Twenty-five posters will be placed when activities warrant.

## PROMOTIONAL ITEMS

***Description***: The following items will be produced and distributed in the watershed. Project staff will use these promotional items as well as distribute them to project participants and at county fair information booths.

1. Four hundred baseball-style caps with project logo.

2. Four hundred coffee cups with project logo.

***Schedule***: Production of caps and cups is scheduled for spring 1991.

## PICNIC/BARBECUE

***Description***: A picnic/barbecue will be held for priority watershed residents and agency staff working with the project. Project staff and landowners gather to socialize, exchange ideas, and discuss project activities.

***Schedule***: Each fall for the duration of the project.

## PARADE FLOAT

***Description***: A float or truck will represent the watershed project in local parades.

***Schedule***: Fifteen parades will be attended over the entire project.

## FAIR DISPLAY

***Description***: Each county will be represented at their respective fairs. A display representing the watershed or a particular component of the watershed will be exhibited.

***Schedule***: Exhibits will be at the Green and Lafayette County fairs during the project.

## PRIVATE WELL SAMPLING

***Description***: Private wells were sampled during the inventory stage of the watershed. Results were returned to landowners who participated. Informational meetings were held in conjunction with UWEX to educate landowners on groundwater principles and the effects of farm management practices on groundwater. Groundwater information packets will be assembled and distributed to landowners.

***Schedule***: Follow-up nitrate testing will be offered to well owners whose initial result exceeded two milligrams per liter (mg/l) nitrate. Follow-up nitrate and triazine testing will be offered to landowners whose initial nitrate levels exceeded 10 mg/l nitrate.

## YOUTH ACTIVITIES

***Description***: Junior high and high school youth in the watershed will be targeted through some combination of the following activities:

1. Introduction of available sustainable agriculture and/or groundwater curricula. This would involve presenting curricula to area teachers.

2. County staff presentations to student groups on nonpoint source topics and the priority watershed program.

3. Development of "Adopt a Stream" project. This would involve organizing a stream clean-up day or an on-going stream clean-up effort.

Table 23. **INFORMATION AND EDUCATION BUDGET AND STAFF NEEDS**

| ACTIVITIES | TOTAL NUMBER | TOTAL DIRECT COST | REQUIRED STAFF HOURS Years 1-3 | REQUIRED STAFF HOURS Years 4-8 |
|---|---|---|---|---|
| Newsletters | 24 | $7500 | 180 | 300 |
| Fact Sheets | 20 | $ 400 | 60 | 100 |
| News Releases | 20 | $ 200 | 30 | 50 |
| Radio | 50 | $ 150 | 60 | 100 |
| Public Meetings and Presentations | 10 | $1500 | 140 | 60 |
| Advisory Committee | 32 | $ 500 | 192 | 320 |
| Tours/Field Days | 9 | $4,500 | 168 | 88 |
| NPM Demo Plot | 1 | $6,400 | 30 | 10 |
| Streambank Demo* | 1 | $15,600 | 30 | 50 |
| Animal Waste Demo | 2 | $45,000 | 90 | 150 |
| Signs: Boundary* | 11 | $ 3,900 | 48 | 0 |
| Participation | 125 | $ 3,750 | 24 | 0 |
| Posters | 750 | $ 600 | 56 | 24 |
| Promo Items: Hats | 400 | $1,200 | 20 | 0 |
| Mugs | 400 | $1,200 | | |
| Picnic/Barbecue | 8 | $8,000 | 180 | 300 |
| Parade Float | 15 | $ 500 | 60 | 100 |
| Fair/Display | 16 | $1,200 | 144 | 240 |
| Monitor Wells: 1st yr | 200 | $2,100 | 300 | 0 |
| 2nd yr | 200 | $1,500 | 300 | 0 |
| TOTAL | | $105,700 | | |

*These items were installed prior to the signing of the plan.

# CHAPTER VII
# INTEGRATED RESOURCE MANAGEMENT PROGRAM

## INTRODUCTION

The purpose of this chapter is to define the principles and guidelines for assuring that the watershed project is coordinated with other resource management programs and activities. Each of these activities is described below.

## FISHERIES

Watershed best management practices (BMPs), such as streambank protection, shoreline buffer strips, and easements, should be implemented in such a way that will enhance fishery management goals. Specifically, all streambank protection BMPs should be installed in such a way that fisheries habitat is enhanced. Large diameter-sized rock should be used below the water line. Rock riprap should be installed and sized so that the placement and size of rock will positively benefit trout habitat. The fishery manager should be consulted for input in the design of each streambank protection BMP.

## WETLAND RESTORATION

Significant amounts of restorable wetland areas exist in this watershed. This is especially so for the floodplain areas along the main stem of the Lower East Branch of the Pecatonica River. The general guidelines for wetland restoration, easement acquisition, and shoreline buffers to protect existing wetlands should be followed. Wetlands that are important wildlife habitats will be identified by the U.S. Fish and Wildlife Service in consultation with the Department of Natural Resources (DNR) private lands manager. Shoreline buffer easements may be acquired adjacent to these wetlands to better protect them from sedimentation and other nonpoint source pollution.

These wetlands (existing and restorable) were identified in the wetlands inventory conducted by the Green County Land Conservation Department (LCD). In addition to the normal priority watershed funding, additional cost-sharing may be available to provide for a 100 percent payment for installation of the BMP. This additional funding may be available through the DNR district private lands manager, Alan Crossley, and/or Eldon McLaury of the U.S. Fish and Wildlife Service. Eligibility for this additional funding would be determined by the DNR's private lands manager or the district nonpoint source coordinator.

## RIPARIAN ZONES

Where possible, riparian zones along creeks should be protected with fencing to protect them from grazing and trampling. These can be acquired through easements so that they receive lasting protection. These areas are important wildlife habitats, particularly for wood ducks.

## STEWARDSHIP

The streambank protection program under stewardship is an important additional means of protecting water quality. Under this program, the DNR could obtain an easement on both sides of the stream (generally 66 feet wide on each side). If needed, the DNR will fence the stream to protect it from livestock access.

Streams eligible in the watershed:

| | | |
|---|---|---|
| Dougherty Creek | 16 miles | Green County |
| Sawmill Creek | 9 miles | Green County |
| Erickson Creek | 5 miles | Green County |

Additional streams should be nominated when the nomination period is reopened.

## NATURAL AREA SITES

Thirteen natural area sites were identified and are listed in Chapter II. To the best extent possible, project managers will protect and properly manage these sites in the Lower East Branch Pecatonica River Watershed.

# PART THREE

# PROJECT EVALUATION

CHAPTER VIII: PROJECT EVALUATION
CHAPTER IX: WATER RESOURCES EVALUATION MONITORING

# CHAPTER VIII
# PROJECT EVALUATION

## INTRODUCTION

This chapter briefly summarizes the plan for monitoring the progress and evaluating the effectiveness of the Lower East Branch Pecatonica River Priority Watershed Project. The evaluation strategy includes these components:

* Administrative review.

* Pollution reduction evaluation.

Information on the first two components will be collected by the Green and Lafayette County Land Conservation Departments (LCDs) and reported on a regular basis to the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP). The DNR performs the third component. Additional information on the numbers and types of practices on cost-share agreements; funds encumbered on cost-share agreements, and funds expended will be provided by the DNR's Bureau of Community Assistance.

Upon completion of the landowner sign-up period, an interim report will be prepared cooperatively by the LCD, the DATCP, and the DNR. This report will summarize the administrative, pollutant load reduction, and water quality information that is available at that time. The report will include preliminary conclusions on the success of the project to date and will recommend actions to be taken during the rest of the implementation phase.

## ADMINISTRATIVE REVIEW

The first component, the administrative review, will focus on the progress of Green and Lafayette Counties in implementing the project. The project will be evaluated with respect to accomplishments, financial expenditures, and staff time spent on project activities.

1. ***Accomplishment Reporting***: The Computer Assisted Management and Planning System, called CAMPS, is a computer data management system that has been developed by the U.S. Soil Conservation Service (SCS). The SCS, the DNR and the DATCP use CAMPS to meet the accomplishment reporting requirements of all three agencies. The Green and Lafayette County LCDs will use CAMPS to collect data for administrative accomplishments, and will provide the information to the DNR and the DATCP for program evaluation.

The Green and Lafayette County LCDs will provide the following data to the DNR and the DATCP on a quarterly basis:

a. Number of personal contacts made with landowners.
b. Completed information and education activities.
c. Number of farm conservation plans prepared for the project.
d. Number of cost-share agreements signed.
e. Number of farm conservation plan and cost-share agreement status reviews completed.
f. Number of farms and acres of cropland checked for proper maintenance of BMPs.

In addition to quarterly reports, Green and Lafayette County representatives will meet with the DNR and the DATCP staff annually to review progress and plan for the subsequent year.

2. ***Financial Expenditures***:

Green and Lafayette Counties will provide the following financial data to the DNR and the DATCP on a quarterly basis:

a. Number of landowner cost-share agreements signed.
b. Amount of money encumbered in cost-share agreements.
c. Number of landowner reimbursement payments made for the installation of best management practices (BMPs), and the amount of money paid.
d. Staff travel expenditures.
e. Information and education expenditures.
f. Expenditures for equipment, materials, and supplies.
g. Expenditures for professional services and staff support costs.
h. Total project expenditures for the LCD staff.
i. Amount of money paid for installation of BMPs, and money encumbered in cost-share agreements.

Green and Lafayette Counties will also provide both agencies with the following financial data on an annual basis:

a. Staff training expenditures.
b. Interest money earned and expended.
c. Total county LCD budget and expenditures on the project.

3. ***Time Spent On Project Activities***: Green and Lafayette Counties will provide time summaries to both departments for the following activities on a quarterly basis:

a. Project and fiscal management.
b. Clerical assistance.
c. Pre-design and conservation planning activities.
d. Technical assistance: practice design, installation, cost-share agreement status review and monitoring.
e. Educational activities.

f. Training activities.
g. Leave time.

## POLLUTANT LOAD REDUCTION

### KEY NONPOINT SOURCES FOR EVALUATING POLLUTANT LOAD REDUCTIONS

The purpose of the second evaluation component, pollutant load reduction, is to calculate reductions in the amount of key pollutants as a result of installing BMPs. Three key sources were identified for estimating changes in pollutant loads that reach creeks in the Lower East Branch of the Pecatonica River Watershed; streambank erosion, upland sediment, and runoff from barnyards and fields spread with manure.

As described in Chapter III, this plan calls for the following pollutant reductions for all subwatersheds:

1. A 40 percent reduction in sediment delivered to streams and a 25 percent overall repair of bank habitat.

2. A 25 percent reduction watershed-wide in sediment entering creeks from agricultural lands.

3. A reduction of the "top" 60 percent of manure and organic matter entering creeks from barnyards.

4. A reduction of the "top" 50 percent of organic matter reaching creeks from fields winterspread with manure.

5. Sediment control for gullies producing over 30 tons sediment per site per year.

6. Restoration of 30 percent of degraded wetlands.

#### STREAMBANKS

Green and Lafayette County LCD staff will calculate changes in streambank sediment in terms of tons of sediment and length of eroding sites. A tally will be kept of landowners contacted, the amount of streambank sediment being generated at the time of contact, and changes in erosion levels estimated after installing BMPs.

## UPLAND SEDIMENT SOURCES

Green and Lafayette Counties will use the WIN (Wisconsin Nonpoint Source) model to estimate sediment reductions due to changes in cropping practices. The counties will use CAMPS to provide data for the WIN model on a quarterly basis, as described above.

## BARNYARD RUNOFF

Green and Lafayette Counties will use the BARNY (Modified ARS) model to estimate phosphorus reductions due to the installation of barnyard control practices. The county will report the information to the DNR through CAMPS.

# CHAPTER IX
# WATER RESOURCES EVALUATION MONITORING

## WATER RESOURCES MONITORING PLAN

### INTRODUCTION

The primary purpose of the monitoring plan is to evaluate the achievements of the priority watershed project in meeting the identified water quality objectives in selected water resources. The plan identifies the monitoring locations, the methods, and the analysis techniques that the Department of Natural Resources (DNR) will use. The principal methods include: fishery surveys; habitat evaluation; macroinvertebrate sampling; temperature and dissolved oxygen monitoring; and flow and water chemistry monitoring.

The evaluation monitoring plan objectives are to assess:

* Changes in the fish and invertebrate communities after restoration and improvement of instream and riparian habitat (i.e., a decreased substrate embedded sediment, improved bank stability, and increased riparian vegetative cover).

* Changes in instream temperature, dissolved oxygen and water chemistry due to improvements in riparian habitat, streambank habitat improvement, and a reduction of sediment and nutrients entering the stream.

### BIOLOGICAL MONITORING

Biological data will consist of both invertebrate and fish collections. The invertebrate samples will be collected from both riffle and pool habitats during spring and mid-late summer. These samples will be collected using a kick net. Community diversity, relative abundance, and Hilsenhoff Biotic Index values will be used to analyze change in the invertebrate population. The samples will be preserved in 90 percent denatured alcohol and sent to University of Wisconsin-Stevens Point for sorting and identification. Sample results will be evaluated using the Hilsenhoff Biotic Index and other biometrics as appropriate (See Appendix A).

Fish data will be collected using a backpack or stream shocker. The fish community will be evaluated using the Index of Biotic Integrity (IBI) (Lyons 1989, Karr 1981, and Karr et al. 1986) and also by comparing the number and abundance of indigenous and seasonal species. Approximately 252 to 310 feet will be surveyed at each site. Since

these are small tributaries, this length will fall well within the recommended sampling distances of 35 to 40 times the stream width.

## SPECIAL MONITORING: DOUGHERTY CREEK

In addition to the monitoring described above, Dougherty Creek was selected as a special monitoring site. This represents an extra monitoring effort which will be conducted on this creek. It is proposed that a monitoring station be established by the U.S. Geological Survey to automatically sample the water quality and flow. The samples will be analyzed for nutrients and sediment. This system will allow for the measurement of the amount of pollutants in the stream during "high flow" times (periods after rainfalls or snowmelt) and during "low flow" times.

The fish populations of the stream will also be measured and changes in the numbers or types of fish over time will be documented. This monitoring is scheduled to begin in 1992 and will be repeated at the interim (1995).

## HABITAT EVALUATION

Habitat evaluation at sites corresponding to those indicated in the appraisal will be conducted using the Ball Habitat Evaluation Form. Refer to the table for the list of sites. These will be done at the interim and at the close of the project (see Table 24).

## REPORTING PROCEDURES

Monitoring results will be reported in an interim report in 1995 and will contain a summary of the pre-implementation data from the watershed. A final report summarizing and evaluating the effectiveness and success of the priority watershed will be completed in 1999.

The following table lists the monitoring activities, staff time and costs by evaluation project. These are preliminary figures and may change after site selection.

## Table 24. Evaluation Monitoring Schedule

| GENERAL EVALUATION | YEAR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| HBI | X | | | | | X | | | | X | |
| Fish Monitoring | X | | | | | X | | | | X | |
| Habitat Evaluation | X | | | | | X | | | | X | |
| Dougherty Creek USGS Stations | | X | X | | | X | X | | | X | X |
| Report Writing | | | | | | | X | | | | X |
| Staff Hours | | 50 | 100 | | | 100 | 150 | | | 100 | 100 |

# APPENDICES

# APPENDIX A
# ASSESSMENT METHODS

## METHODS USED TO ASSESS THE WATER QUALITY AND NONPOINT SOURCE CONDITIONS IN THE LOWER EAST BRANCH PECATONICA WATERSHED PROJECT

## WATER RESOURCE ASSESSMENT METHODS

### INTRODUCTION

Part of the Lower East Branch Pecatonica River Priority Watershed Project's planning process was to determine the current water quality and water use conditions of the ground and surface water resources in the project area. Then an assessment was made of the potential changes in water quality and use that might be expected as a result of the control of nonpoint source pollutants.

The assessment was made based on many sources of information including: chemical and biological water quality data from the Department of Natural Resources (DNR) files, the Surface Water Resources of Green County publication (DNR, 1980); Surface Water Resources of Lafayette County publication (DNR,1968) and input from the county Land Conservation Department (LCD) staff, the DNR fish managers, and the DNR water quality specialists. Two of the tools used in this assessment are discussed in more detail below.

## BIOTIC INDEX

The type of insects found living on rocks and in other habitats in a stream reflects the water conditions of that stream. Certain species of insects will tolerate only unpolluted waters while others are able to survive various degrees of water pollution. The term pollution in this discussion refers to organic material in the water. Two ways organic pollutants affect water quality are that the organic material adds nutrients to the water which may result in nuisance growth of algae or weeds, and the bacterial breakdown of the organic material can deplete water of its dissolved oxygen, which is required for fish survival.

A system—the Hilsenhoff Biotic Index, or HBI (Hilsenhoff, 1982)—developed in Wisconsin indicates the degree of organic pollution in a stream by the types of insects living in the stream. Organic pollution tolerance values are assigned to various species of insects. The scale of the values is zero to 10, with zero being the least tolerant (that is, insects least tolerant to organic pollution in the stream). The number and types of insects found at a stream site are used to calculate an HBI value between zero and five

for the stream. Qualitative descriptions of water quality for the index values are given in Table A-1.

Table A-1. Qualitative Descriptions for the Biotic Index

| HBI Range | Water Quality | Degree of Organic Pollution |
|---|---|---|
| 0.00 - 3.50 | Excellent | No organic pollution |
| 3.51 - 4.50 | Very Good | Possible slight organic pollution |
| 4.51 - 5.50 | Good | Some organic pollution |
| 5.51 - 6.50 | Fair | Significant organic pollution |
| 6.51 - 8.50 | Poor | Very significant organic pollution |
| 8.51 -10.00 | Very Poor | Severe organic pollution |

Source: Hilsenhoff 1987

This procedure was conducted on eleven streams at 33 sites in the watershed. In order for a biotic index to be calculated, at least 80 individual insects must be found in the sample.

## STREAM FISHERY HABITAT ASSESSMENT

In order to determine the present and potential future fishery uses of the streams, a procedure developed by Joe Ball of the DNR was used. This procedure is described in Stream Classification Guidelines for Wisconsin (Ball, 1982). The system uses an inventory of the stream's physical fish habitat conditions (such as stream flow, bed type, amount of riffles and pools, and streambank conditions) along with other parameters (water quality, water temperature, pH [degree of acidity or alkalinity], and current stream biotic conditions) to classify the present fishery use of the stream.

Then this information is modified to simulate the conditions that may be present as a result of a successful nonpoint source control project in the watershed. This second step results in an indication of the fishery which may be expected after successful nonpoint source control.

Table A-2 indicates the general conditions that need to be present in order for a stream to support various fishery types.

Table A-2. Physical and Chemical Guidelines for Aquatic Life Use

| Parameter | Use Class and Criteria | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| Flow (cfs) (1) | >.5 | >3 | >.2 | >.1 | >0 |
| Water Quality | | | | | |
| Dissolved Oxygen (mg/l) (2)(3) | >4 | >3 | >3 | >1 | <1 |
| Temperature (Deg.F)(3) | <75 | <86 | <86 | <90 | >90 |
| pH (3) | 5-9.5 | 5-10.5 | 5-10.5 | 4-11 | 4-11 |
| Toxics (4) | <acute | <acute | <acute | acute | >acute |
| Habitat Rating (1) | <144 | <144 | <144 | >144 | >200 |

(1) Wisconsin DNR
(2) U.S. EPA (1977)
(3) Alabaster and Lloyd (1980)
(4) U.S. EPA (1980)

"<" means "less than"
">" means "greater than"

Use Classes
A: Cold Water Sport Fishery
B: Warm Water Sport Fishery
C: Valuable Tolerant Forage Fishery
D: Rough Fish
E: No Fishery

Source: DNR Technical Bulletin (Unpublished) (Ball, 1982).

## GROUNDWATER SAMPLING

Nitrate is one of the oldest contaminants known to exist in Wisconsin groundwater. Nitrate is water soluble and moves easily through soil. It does not naturally occur in soil minerals or groundwater. Any elevated levels are due to human activities. A total of 279 wells in the watershed project area were sampled. Sources of nitrate in groundwater include fertilizers, animal waste, septic systems, and land disposal of nitrogen-containing

waste in amounts that exceed the ability of plants to use it quickly. The enforcement standard of 10 milligrams per liter (mg/l) was exceeded in 22 percent of wells inventoried. The preventative action limit was exceeded in 55 percent of wells inventoried.

## WETLAND INVENTORY

The objective of the wetland inventory was to identify existing and modified or converted wetlands for the purpose of protection from degradation or potential restoration to native cover. Using the Wisconsin Wetland Inventory and the Soil Conservation Service Wetland Inventory maps, wetlands were marked onto separate transparencies overlaying 660 scale aerial photos. Hydric soils were also marked onto an overlay. Acreages were measured for each wetland and hydric soil. All landowners with wetlands which met any one of the following criteria were listed:

1. Wetlands five acres or larger with hydric soils immediately adjacent.
2. Converted wetlands five acres or larger.
3. Farmed wetlands five acres or larger.

This was done by corresponding plat book information with the aerial photos. Each wetland was then checked in the field and the following information was recorded:

1. Legal description to quarter to quarter section.
2. Land use.
3. Cover type.
4. Drainways, surface or tile and outlets.
5. Adjacent land use.
6. WIN parcel number.

Data was recorded for each wetland on a separate inventory form.

## SUMMARY

The biotic index and the stream habitat assessment are both important tools for helping to establish water quality and water use objectives in the watershed project. Although no water quality assessment tool can predict with 100 percent accuracy the changes in water quality and water use, these tools can be useful in appraising the current and potential future conditions of the water resources in the watershed project area.

# POLLUTANT SOURCE ASSESSMENT METHODS

## INTRODUCTION

Another part of the watershed planning process was the collection of information on the various nonpoint sources of pollutants in the watershed. The collection of data was conducted under the supervision of the Green and Lafayette County Land Conservation Departments (LCDs) with funding support from the DNR. The LCDs hired staff to gather the actual field data. The LCDs reviewed and approved the quality of this data. Then the LCDs sent the data to the DNR for analysis. The inventory methods used for each nonpoint pollutant source are described below.

Before the inventories were conducted, the watershed was divided into 17 subwatersheds. The divisions were based upon individual water resources which could be protected or improved by controlling nonpoint sources of pollutants. All inventory data was organized by subwatershed. With this information, objectives could be set for each water body. In addition, the corresponding reduction in pollutants needed to meet the objectives could be determined.

## UPLAND SEDIMENT SOURCES

Upland erosion is of concern because it can be a major contributor of sediment to the water resources of a watershed. Sediment in streams and lakes adversely affects the water resources in many ways. Suspended sediment makes it difficult for fish to feed, and it abrades fish gills, making the fish more susceptible to disease. Suspended sediment also causes the water to be warmer in the summer, and warm water cannot hold as much oxygen as cold water. Sediment that settles out to the stream fills up pools in streams and destroys fish habitat. Soil from cropland entering the water also contains nutrients and pesticides, which increases the algae and weed growth in lakes and harms the aquatic life of a water body.

An upland sediment source for this project is defined as the sheet and rill erosion from land areas. This erosion is commonly measured by sediment delivery in tons per acre per year. This sediment results from the overland flow of water on fields. It does not include the gully and streambank types of erosion both of which also contribute sediment to the surface waters.

The evaluation for this project quantified upland erosion and estimated the amount of eroded sediment that reaches surface waters. Cropland, pastures, grasslands, woodlands and other open non-urban land uses were investigated. Individual parcels were identified on aerial photographs. Parcel boundaries were based on the slope, cropping pattern or predominant vegetation type, property boundaries, and drainage characteristics.

The inventory was conducted on 145 square miles, using existing data and field investigations. Existing data sources included site specific farm conservation plans, aerial photographs, U.S. Geological Survey 1"=2,000' scale quadrangle maps, and the county's soil survey. The information obtained for each parcel included size, soil type and its

ability to erode, slope percent and length, land cover, crop rotation, present management, overland flow distance and destination, channel type, and receiving water.

Upland erosion and sediment delivery was determined using the Wisconsin Nonpoint Source Model, also called WIN (Baun, 1988). This analytical tool was developed by the Wisconsin Nonpoint Source Water Pollution Abatement Program to assess the pollution potential from eroding uplands. The WIN model calculates the average annual quantity of eroded soil that reaches surface waters by determining the soil loss and routing the runoff originating on each parcel under a "typical" year of precipitation. The parcels are ranked according to their potential to contribute sediment to surface waters.

## STREAMBANK EROSION SURVEY

Streambank erosion is the bank failure along channels caused by the cutting action of water on the banks. This erosion is important because of its direct impact on fish habitat in terms of bank shade and cover, in addition to the impact of the sediment filling up the stream's pools. Streambank erosion is a natural process but is often accelerated by cultural activities such as grazing cattle.

The inventory method used to evaluate streambank erosion was a modification of the Phase II of the Land Inventory Monitoring process (SCS). The main channels of 11 streams, totalling 190 stream miles, were assessed with this method. For each erosion site, the method estimates the volume and the tons of sediment lost on a yearly average. This was done through measuring the length, height, and recessional rate of each erosion site. Recession rates were determined based upon the physical characteristics of the eroded site. The volume of sediment was then multiplied by the density of the sediment to obtain the tons of soil loss from the site. Along with this data, information on the location, landowner identification, and cattle access was collected for each site. Field personnel collected this information by walking the streams. Each erosion site was mapped on ASCS eight-inch-to-the-mile air photos.

## BARNYARD RUNOFF

Dairy operations are the major type of agriculture in the Lower East Branch Pecatonica Watershed. All barnyards were inventoried to determine the impact of barnyard runoff on water quality. Barnyard runoff carries manure to the streams and ponds of the watershed.

Manure contains several components that adversely affect water quality and aquatic life. Manure contains nitrogen in the form of ammonia. In high concentrations ammonia can be toxic to fish and other aquatic life. When manure enters a water system the breakdown of the organic matter depletes oxygen which fish and other organisms require to survive. Also, the nutrients in manure (including nitrogen and phosphorus) will promote nuisance algae and weed growth in the streams and ponds. Finally, bacteria found in livestock manure is harmful to other livestock drinking the water, and humans using the water for recreation.

The United States Department of Agriculture - Agriculture Research Service developed a computer model to estimate the amount of pollutants coming from a barnyard as a result of a rainstorm (Young, et al. 1982). This model was modified by the Wisconsin DNR's Nonpoint Source and Land Management Section. The model has been used to indicate which barnyards within a watershed have the greatest potential to affect water quality from rainfall runoff that washes through a barnyard. The model does not assess any needs for manure storage or the impact from manure runoff from spread fields--it only assesses the barnyard runoff pollutant quantities.

The information needed to run this model was collected on all of the barnyards in the Lower East Branch Pecatonica Watershed. The data that this model requires includes: the types and numbers of livestock; the size of the yard; the physical characteristics of the area which contributes surface runoff waters to the yard; and the physical characteristics of the area through which the runoff waters leaving the barnyard flow before becoming channelized. A rainfall amount is assigned to the model. The 10-year, 24-hour rain event (4.2 inches) was selected.

With this information, the model calculates the pounds of phosphorus and the pounds of Chemical Oxygen Demand (COD) for each barnyard as a result of the selected rainfall event. Chemical Oxygen Demand is a measure of the amount of organic material in the barnyard runoff.

## MANURE SPREADING RUNOFF

The disposal of livestock wastes on land is a concern for water quality when manure is spread on frozen land with steep slopes or on land in a floodplain. Under these conditions, the spread manure runs off with melting snow or winter rain and enters the streams and lakes of the watershed. The impacts from this runoff are the same as those mentioned in the barnyard runoff discussion.

The information collected for the upland sediment inventory and the barnyard runoff inventory was combined and used to estimate the amount of unsuitable land in this watershed that is used for spreading manure during the winter. Lands unsuitable for winter spreading of manure were defined as parcels with slopes greater than six percent or having soil types prone to flooding.

The first step in this evaluation was to estimate how much land was required by each livestock operation to dispose of the manure generated over a 180-day period (the frozen ground period). The amount of manure generated was determined based on the number and type of animals for each operation. Using a rate of 25 tons per acre per year, the number of acres required for manure disposal was calculated for each operation. This number was compared to the acres of land suitable for winterspreading for each landowner according to the upland sediment inventory information. Lands unsuitable for winterspreading were those fields with greater than six percent slope or those fields in the floodway. In this manner it was estimated, on an average basis, how many acres of unsuitable land were used for manure disposal during the winter. This procedure assumed every field had an equal chance for manure disposal from the landowner. The procedure does not account for the fact that livestock operators do not evenly spread

their manure across all of their property. In general, the most accessible land is used for disposal of the manure.

## POINT SOURCES OF POLLUTION

Unlike the activities mentioned above, the point sources of pollution in Wisconsin are regulated by law. For each municipal or industrial wastewater discharge or landfill, the DNR issues a permit which controls the activities and the effluent from each site. The point sources have been the most significant, and the most obvious, sources of water quality impairment in the past. With the large scale effort and funding directed at clean-up of point source pollution in the past 20 years, the water quality impacts from these sources in the watershed were minimized.

As mentioned above, each municipal or industrial discharger or landfill has a permit from the DNR. These permits are reviewed to determine how well the facility is meeting its requirements. If a facility is not in compliance, there are regulatory measures which are employed to insure that these point sources do not compromise the control of the nonpoint sources of pollutants.

# APPENDIX B
# GLOSSARY

ACUTE TOXICITY:
Any poisonous effect produced by a single short-term exposure to a chemical that results in a rapid onset of severe symptoms.

ADVANCED WASTEWATER TREATMENT:
The highest level of wastewater treatment for municipal treatment systems. It requires removal of all but 10 parts per million of suspended solids and biological oxygen and/or 50% of the total nitrogen. Advanced wastewater treatment is also known as " tertiary treatment."

AGRICULTURAL CONSERVATION PROGRAM (ACP):
A federal cost-sharing program to help landowners install measures to conserve soil and water resources. ACP is administered by the USDA ASCS through county ACP committees.

ALGAE:
A group of microscopic, photosynthetic water plants. Algae give off oxygen during the day as a product of photosynthesis and consume oxygen during the night as a result of respiration. Thus algae effect the oxygen content of water. Nutrient-enriched water increases algae growth.

AMMONIA:
A form of nitrogen ($NH_3$) found in human and animal wastes. Ammonia can be toxic to aquatic life.

ANAEROBIC:
Without oxygen.

AREAWIDE WATER QUALITY MANAGEMENT PLANS (208 PLANS):
A plan to document water quality conditions in a drainage basin and make recommendations to protect and improve basin water quality. Each basin in Wisconsin must have a plan prepared for it, according to section 208 of the Clean Water Act.

AVAILABILITY:
The degree to which toxic substances or other pollutants that are present in sediments or elsewhere in the ecosystem are available to affect or be taken up by organisms. Some pollutants may be "bound up" or unavailable because they are attached to clay particles or are buried by sediment. The amount of oxygen, pH, temperature and other conditions in the water can affect availability.

BACTERIA:
Single-cell, microscopic organisms. Some can cause disease, and some are important in the stabilization of organic wastes.

BASIN PLAN:
See "Areawide Water Quality Management Plan".

BENTHIC ORGANISMS (BENTHOS):
The organisms living in or on the bottom of a lake or stream.

BEST MANAGEMENT PRACTICE (BMP):
The most effective, practical measures to control nonpoint sources of pollutants that runoff from land surfaces.

BIOACCUMULATION:
The uptake and retention of substances by an organism from its surrounding medium and from its food. Chemicals move through the food chain and tent to end up at higher concentrations in organisms at the upper end of the food chain such as predator fish, or in people or birds that eat these fish.

BIODEGRADABLE:
Waste which can be broken down by bacteria into basic elements. Most organic wastes such as food remains and paper are biodegradable.

BIOTA:
All living organisms that exist in an area.

BUFFER STRIPS:
Strips of grass or other erosion-resisting vegetation between disturbed areas and a stream or lake.

CARCINOGEN:
A chemical capable of causing cancer.

CLEAN WATER ACT:
See "Public Law 92-500."

CONSERVATION TILLAGE:
Planting row crops while disturbing the soil only slightly. In this way a protective layer of plant residue says in the surface; erosion is decreases.

CONTAMINANT:
Some material that has been added to water that is not normally present. This is different from a pollutant, as a pollutant suggests that there is too much of the material present.

COST-EFFECTIVE:
A level of treatment or management with the greatest incremental benefit for the money spent.

DISSOLVED OXYGEN (DO):
Oxygen dissolved in water. Low levels of dissolved oxygen cause bad smelling water and threaten fish survival. Low levels of dissolved oxygen are often due to inadequate wastewater treatment. The Department of Natural Resources considers 5 ppm DO necessary for fish and aquatic life.

ECOSYSTEM:
The interacting system of biological community and its nonliving surrounding.

EFFLUENT:
Solid, liquid or gas wastes (byproducts) which are disposed on land, in water or in air. As used in the RAP generally means wastewater discharges.

ENVIRONMENTAL REPAIR FUND:
A fund established by the Wisconsin Legislature to deal with abandoned landfills.

EROSION:
The wearing away of the land surface by wind or water.

EUTROPHIC:
Refers to a nutrient-rich lake. Large amounts of algae and weeds characterize a eutrophic lake (see also "Oligotrophic" and "Mesotrophic").

EUTROPHICATION:
The process of nutrient enrichment of a lake loading to increased production of aquatic organisms. Eutrophication can be accelerated by human activity such as agriculture and improper waste disposal.

FECAL COLIFORM:
A group of bacteria used to indicate the presence of other bacteria that cause disease. The number of coliform is particularly important when water is used for drinking and swimming.

FISHABLE AND SWIMMABLE:
Refers to the water quality goal set for the nation's surface waters by Congress in the Clean Water Act. All waters were to meet this goal by 1984.

FOOD CHAIN:
A sequence of organisms in which each uses the next as a food source.

GROUNDWATER:
Underground water-bearing areas generally within the boundaries of a watershed, which fill internal passageways of porous geologic formations (aquifers) with water which flows in response to gravity and pressure. Often used by the source of water for communities and industries.

HABITAT:
The place or type of site where a plant or animal naturally lives and grows.

HERBICIDE:
A type of pesticide that is specifically designed to kill plants and can also be toxic to other organisms.

LANDFILL:
A conventional sanitary landfill is "a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading solid wastes in thin layers, materials at the end of each operating day". Hazardous wastes frequently require various types of pretreatment before they are disposed of, i.e., neutralization chemical fixation encapsulation. Neutralizing and disposing of wastes should be considered a last resort. Repurifying and reusing waste materials or recycling them for another use may be less costly.

LEACHATE:
The contaminated liquid which seeps from a pile or cell of solid materials and which contains water, dissolved and decomposing solids. Leachate may enter the groundwater and contaminate or inking water supplies.

LOAD:
The total amount of materials or pollutants reaching a given local.

MACROPHYTE:
A rooted aquatic plant.

MASS:
The amount of material a substance contains after measured by its weight (in a gravitational field).

MASS BALANCE:
A study that examines all parts of the ecosystem to determine the amount of toxic or other pollutant present, its sources, and the processes by which the chemical moves through the ecosystem.

MESOTROPHIC:
Refers to a moderately fertile nutrient level of a lake between the oligotrophic and eutrophic levels. (See also "Eutrophic" and "Oligotrohpic.")

MILLIGRAMS PER LITER (mg/1):
A measure of the concentration of substance in water. For most pollution measurement this is the equivalent to "parts per million".

NONPOINT SOURCE POLLUTION (NSP):
Pollution whose sources cannot be traced to a single point such as a municipal or industrial wastewater treatment plant discharge pipe. Nonpoint sources include eroding farmland and construction sites, urban streets, and barnyards. Pollutants from these sources reach water bodies in runoff, which can best be controlled by proper land management.

NPS:
See nonpoint source pollution.

OLIGOTROPHIC:
Refers to an unproductive and nutrient-poor lake. Such lakes typically have very clear water. (See also "Eutrophic" and "Mesotrophic.")

PATHOGEN:
Any infective agent capable of producing disease; may be a virus, bacterium, protozoan, etc.

PESTICIDE:
Any chemical agent used for control of specific organisms, such as insecticides, herbicides, fungicides, etc.

PH:
A measure of acidity or alkalinity, measured on a scale of 0 to 14 with 7 being neutral and 0 being most acid, and 14 being most alkaline.

PHOSPHORUS:
A nutrient that when reaching lakes in excess amounts can lead to overfertile conditions and algae blooms.

PLANKTON:
Tiny plants and animals that live in water.

POINT SOURCES:
Sources of pollution that have discrete discharges, usually from a pipe or outfall.

POLLUTION:
The presence of materials or energy whose nature, location, or quantity produces undesired environmental effects.

PRIORITY WATERSHED:
A drainage area about 100,000 acres in size selected to receive Wisconsin Fund money to help pay the cost of controlling nonpoint source pollution. Because money is limited, only watersheds where problems are critical, control is practical, and cooperation is likely are selected for funding.

PRODUCTIVITY:
A measure of the amount of living matter which is supported by an environment over a specific period of time. Often described in terms of algae production for a lake.

PUBLIC LAW 92-500 (CLEAN WATER ACT):
The federal law that set national policy for improving and protecting the quality of the nation's waters. The law set a timetable for the cleanup of the nation's waters and stated that they are to be fishable and swimmable. This also required all discharges of pollutants to obtain a permit and meet the conditions of the permit. To accomplish this pollution cleanup billions of dollars have been made available to help communities pay the cost of building sewage treatment facilities. Amendments in the Clean Water Act were made in 1977 by passage of Public Law 95-217, and in 1987.

PUBLIC PARTICIPATION;
The active involvement of interested and affected citizens in governmental decision-making.

PUBLICLY OWNED TREATMENT WORKS (POTW):
A wastewater treatment plan owned by a city, village or other unit of government.

RECYCLING:
The process by which waste materials are transformed into new products.

RIPARIAN:
Belonging or relating to the bank of a lake, river or stream.

RIPRAP:
Broken rock, cobbles, or boulders placed on the bank of a stream to protect it against erosion.

RULE:
Refers to Wisconsin administrative rules. See Wisconsin Administrative Code.

RUNOFF:
Water from rain, snow melt, or irrigation that flows over the ground surface and returns to streams. Runoff can collect pollutants from air or land and carry them to receiving waters.

SEDIMENT:
Soil particles suspended in and carried by water as a result of erosion.

SEPTIC SYSTEM:
Sewage treatment and disposal for homes not connected to sewer lines. Usually the system includes a tank and drain field. Solids settle to the bottom of the tank; liquid percolates through the drain field.

SLUDGE:
A byproduct of wastewater treatment; waste solids suspended in water.

SOLID WASTE:
Unwanted or discharged material with insufficient liquid to be free flowing.

STANDARDS:
See water quality standards.

SUSPENDED SOLIDS (SS):
Small particles of solid pollutants suspended in water.

SYNERGISM:
The characteristic property of a mixture of toxicants that exhibits a greater-that-additive cumulative toxic effect.

TREATMENT PLANT:
See wastewater treatment plant.

TROPHIC STATUS:
The level of growth or productivity of a lake as measured by phosphorus content, algae abundance, and depth of light penetration.

TURBIDITY:
Lack of water clarity. Turbidity is usually closely related to the amount of suspended solids in water.

VARIANCE:
Government permission for a delay or exception in the application of a given law, ordinance or regulation. Also, see water quality standard variance.

VOLATILE:
Any substance that evaporates at a low temperature.

WASTEWATER:
Water that has become contaminated as a byproduct of some human activity. Wastewater includes sewage, washwater and the water-borne wastes of industrial processes.

WASTE:
Unwanted materials left over from manufacturing processes, refuse from places of human habitation or animal habitation.

WASTEWATER TREATMENT PLANT:
A facility for purifying wastewater. Modern wastewater treatment plants are capable of removing 95% of organic pollutants.

WATER QUALITY CRITERIA:
A measure of the physical, chemical or biological characteristics of a water body necessary to protect and maintain different water uses (fish and aquatic life, swimming, etc.).

WATER QUALITY STANDARDS:
The legal basis and determination of the use of a water body and the water quality criteria, physical, chemical, or biological characteristics of a water body, that must be met to make it suitable for the specified use.

WATERSHED:
The land area that drains into a lake or river.

WETLANDS:
Those areas that are inundates or saturated by surface or groundwater at a frequency and duration sufficient to support a variety of vegetative or aquatic life. Wetland vegetation requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas.

WISCONSIN ADMINISTRATIVE CODE:
The set of rules written and used by state agencies to implement state statutes. Administrative codes are subject to public hearing and have the force of law.

WISCONSIN FUND:
A state program that helps pay the cost of reducing water pollution. Funding for the program comes from general revenues and bonds and is based on a percentage of the state;s taxable property value. The Wisconsin Fund includes these programs:

Point Source Water Pollution Abatement Grant Program - Provides grants for 60% of the cost of constructing wastewater treatment facilities. Most of this program's money goes for treatment plant construction, but 3% of this fund is available for repair or replacement of private , onsite sewer systems.

Nonpoint Source Water Pollution Abatement Grant Program - Funds to share the cost of reducing water pollution nonspecified sources are available in selected priority watersheds.

Solid Waste Grant Program - Communities planning for solid waste disposal sites are eligible for grant money. $500,000 will be available each year to help with planning costs.

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT GRANT PROGRAM:

A state cost-share program established by the State Legislature in 1978 to help pay the costs of controlling nonpoint source pollution. Also known as the nonpoint source element of the Wisconsin Fund or the Priority Watershed Program.

WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES):

A permit system to monitor and control the point source dischargers of wastewater in Wisconsin. Dischargers are required to have a discharge permit and meet the conditions it specifies.

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Wisconsin Department of Natural Resources. 1978. Wisconsin administrative code, Chapter NR 120, Nonpoint Source Pollution Abatement Program Register , November 1989, no. 407. 26 pp.

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# PRIORITY WATERSHED PROJECTS IN WISCONSIN
## 1991

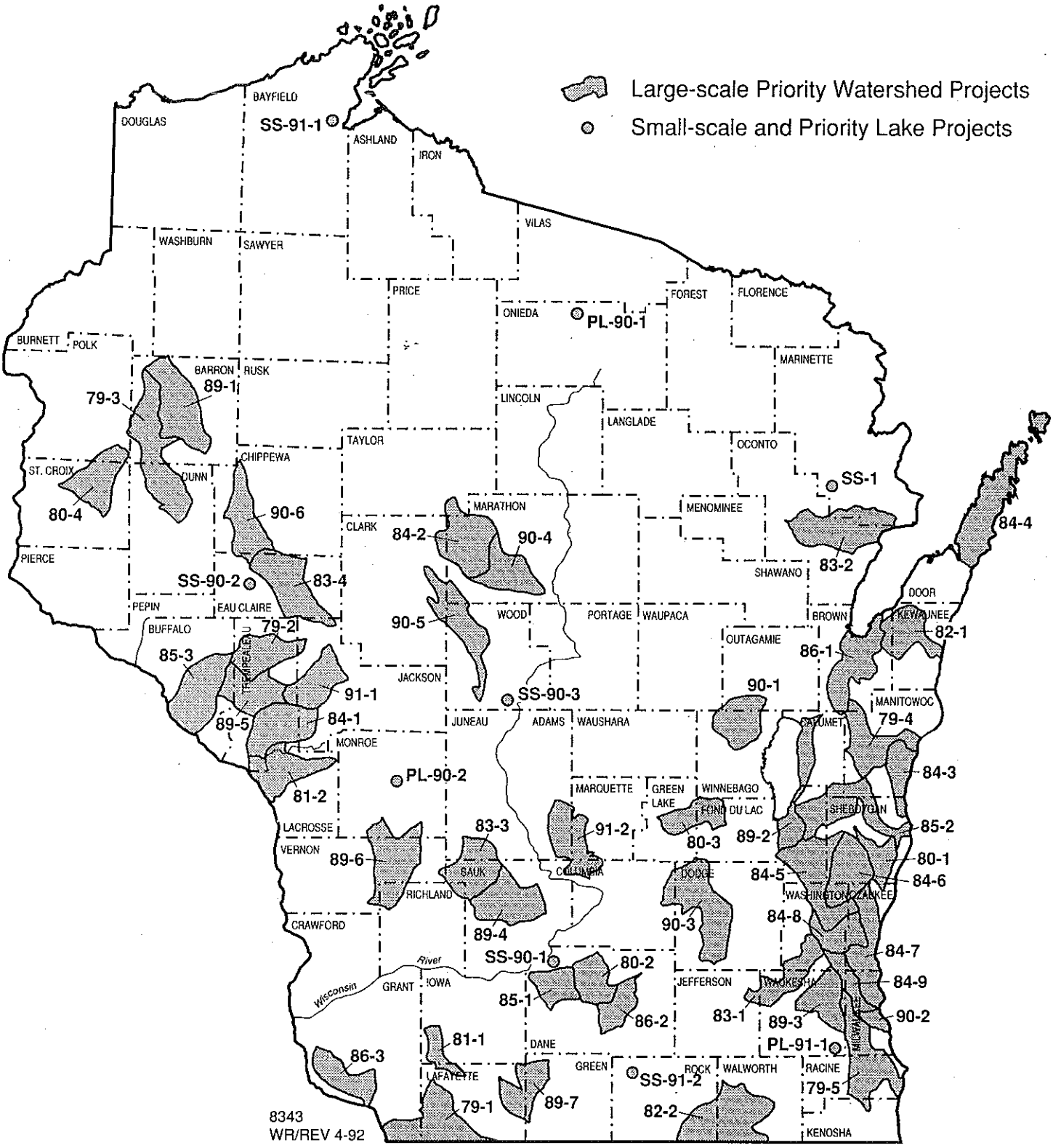
| Map Number | Large-scale Priority Watershed Project | County(ies) | Year Project Selected |
|---|---|---|---|
| 79-1 | Galena River* | Grant, Lafayette | 1979 |
| 79-2 | Elk Creek* | Trempealeau | 1979 |
| 79-3 | Hay River* | Barron, Dunn | 1979 |
| 79-4 | Lower Manitowoc River* | Manitowoc, Brown | 1979 |
| 79-5 | Root River* | Racine, Milwaukee, Waukesha | 1979 |
| 80-1 | Onion River* | Sheboygan, Ozaukee | 1980 |
| 80-2 | Sixmile-Pheasant Branch Creek* | Dane | 1980 |
| 80-3 | Big Green Lake | Green Lake, Fond du Lac | 1980 |
| 80-4 | Upper Willow River* | Polk, St. Crox | 1980 |
| 81-1 | Upper West Branch Pecatonica River* | Iowa, Lafayette | 1981 |
| 81-2 | Lower Black River | La Crosse, Trempealeau | 1981 |
| 82-1 | Kewaunee River | Kewaunee, Brown | 1982 |
| 82-2 | Turtle Creek | Walworth, Rock | 1982 |
| 83-1 | Oconomowoc River | Waukesha, Washington, Jefferson | 1983 |
| 83-2 | Little River | Oconto, Marinette | 1983 |
| 83-3 | Crossman Creek/Little Baraboo River | Sauk, Juneau, Richland | 1983 |
| 83-4 | Lower Eau Claire River | Eau Claire | 1983 |
| 84-1 | Beaver Creek | Trempealeau, Jackson | 1984 |
| 84-2 | Upper Big Eau Pleine River | Marathon, Taylor, Clark | 1984 |
| 84-3 | Sevenmile-Silver Creeks | Manitowoc, Sheboygan | 1984 |
| 84-4 | Upper Door Peninsula | Door | 1984 |
| 84-5 | East & West Branch Milwaukee River | Fond du Lac, Washington, Sheboygan, Dodge, Ozaukee | 1984 |
| 84-6 | North Branch Milwaukee River | Sheboygan, Washington, Ozaukee, Fond du Lac | 1984 |
| 84-7 | Milwaukee River South | Ozaukee, Milwaukee | 1984 |
| 84-8 | Cedar Creek | Washington, Ozaukee | 1984 |
| 84-9 | Menomonee River | Milwaukee, Waukesha, Ozaukee, Washington | 1984 |
| 85-1 | Black Earth Creek | Dane | 1985 |
| 85-2 | Sheboygan River | Sheboygan, Fond du Lac, Manitowoc, Calumet | 1985 |
| 85-3 | Waumandee Creek | Buffalo | 1985 |
| 86-1 | East River | Brown, Calumet | 1986 |
| 86-2 | Yahara River —Lake Monona | Dane | 1986 |
| 86-3 | Lower Grant River | Grant | 1986 |
| 89-1 | Yellow River | Barron | 1989 |
| 89-2 | Lake Winnebago East | Calumet, Fond du Lac | 1989 |
| 89-3 | Upper Fox River (Ill.) | Waukesha | 1989 |
| 89-4 | Narrows Creek — Baraboo River | Sauk | 1989 |
| 89-5 | Middle Trempealeau River | Trempealeau, Buffalo | 1989 |
| 89-6 | Middle Kickapoo River | Vernon, Monroe, Richland | 1989 |
| 89-7 | Lower East Branch Pecatonica River | Green, Lafayette | 1989 |
| 90-1 | Arrowhead River & Daggetts Creek | Winnebago, Outagamie, Waupaca | 1990 |
| 90-2 | Kinnickinnic River | Milwaukee | 1990 |
| 90-3 | Beaverdam River | Dodge, Columbia, Green Lake | 1990 |
| 90-4 | Lower Big Eau Pleine River | Marathon | 1990 |
| 90-5 | Upper Yellow River | Wood, Marathon, Clark | 1990 |
| 90-6 | Duncan Creek | Chippewa, Eau Claire | 1990 |
| 91-1 | Upper Trempealeau River | Jackson, Trempealeau | 1991 |
| 91-2 | Neenah Creek | Adams, Marquette, Columbia | 1991 |

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

| Map Number | Priority Lake Project | County(ies) | Year Project Selected |
|---|---|---|---|
| PL-90-1 | Minocqua Lake | Oneida | 1990 |
| PL-90-2 | Lake Tomah | Monroe | 1990 |
| PL-91-1 | Little Muskego, Big Muskego and Wind Lakes | Waukesha, Racine, Milwaukee | 1991 |

** Project completed*

# Priority Watershed Projects in Wisconsin
# 1991



# DNR Field Districts and Areas

District Boundaries
Area Boundaries
District Offices
Area Offices

NORTHWEST
WESTERN
NORTH CENTRAL
LAKE MICHIGAN
SOUTHEAST
SOUTHERN

DOUGLAS
BAYFIELD
Brule
ASHLAND
IRON
VILAS
Woodruff
WASHBURN
SAWYER
Spooner
PRICE
Park Falls
ONEIDA
FOREST
FLORENCE
MARINETTE
Rhinelander
BURNETT
POLK
BARRON
Cumberland
RUSK
LINCOLN
LANGLADE
Antigo
OCONTO
Marinette
TAYLOR
CHIPPEWA
ST. CROIX
DUNN
MARATHON
MENOMINEE
CLARK
PIERCE
EAU CLAIRE
Eau Claire
SHAWANO
DOOR
PEPIN
BUFFALO
TREMPEALEAU
WOOD
PORTAGE
WAUPACA
OUTAGAMIE
Green Bay
KEWAUNEE
Wisconsin Rapids
JACKSON
Black River Falls
BROWN
JUNEAU
ADAMS
WAUSHARA
WINNEBAGO
MANITOWOC
MONROE
Oshkosh
CALUMET
LA CROSSE
MARQUETTE
GREEN LAKE
La Crosse
SHEBOYGAN
VERNON
FOND DU LAC
SAUK
COLUMBIA
DODGE
Horicon
WASHING-TON
OZAUKEE
RICHLAND
CRAWFORD
DANE
IOWA
JEFFERSON
WAUKESHA
Madison
Dodgeville
MILWAUKEE
Milwaukee
GRANT
GREEN
ROCK
WALWORTH
RACINE
LAFAYETTE
KENOSHA

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## OUR MISSION:

To protect and enhance our Natural Resources —
our air, land and water;
our wildlife, fish and forests.

To provide a clean environment
and a full range of outdoor opportunities.

To insure the right of all Wisconsin citizens
to use and enjoy these resources in
their work and leisure.

And in cooperation with all our citizens
to consider the future
and those who will follow us.

**Wisconsin**
**Dept. of Natural Resources**

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