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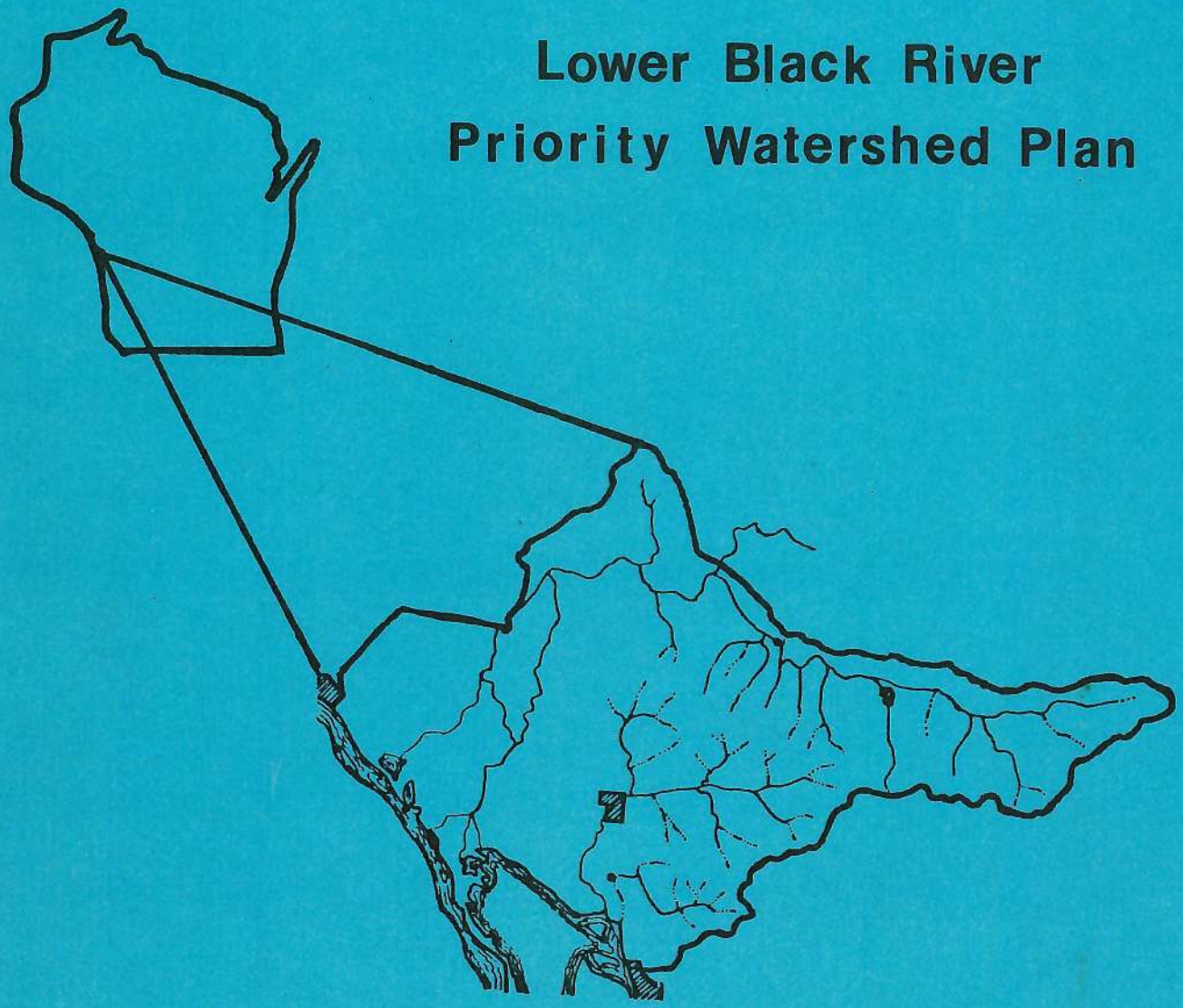
Lower Black River Priority Watershed Plan



DESIGNATED MANAGEMENT AGENCIES

La Crosse County Board
Trempealeau County Board
City of Onalaska
Village of Holmen

COOPERATING AGENCIES

U.S.D.A. Soil Conservation Service
U.S.D.A. Agricultural Stabilization & Conservation Service
University of Wisconsin Extension
Wisconsin Department of Natural Resources

This plan was prepared with the assistance of the Wisconsin Department of Natural Resources under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program.

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

June 2, 1983

File Ref: 3200

The Lower Black River Priority Watershed Plan and the Program for Implementation for the plan have been reviewed by Department staff. They meet the intent and conditions of s. 144.25, Statutes, and NR 120, Wisconsin Administrative Code. They are consistent with the areawide water quality plan (Section 208, PL 92-500) for the Black River Basin and serve to implement it. They are hereby approved and become part of the areawide water quality plan.

Sincerely,

C. D. Besadny
Secretary

RESOLUTION (109 -83)

To: Honorable Members of the La Crosse County Board of Supervisors

Re: Approval of Lower Black River Watershed Plan

WHEREAS, the Land Conservation Committee has reviewed the initial draft of the Lower Black River Watershed Plan and has held a public hearing, and;

WHEREAS, the Land Conservation Committee will be the governing committee for carrying out the County's role in the plan, and;

WHEREAS, the Department of Natural Resources requires a letter of approval from the Land Conservation Committee, and;

WHEREAS, the plan will require Grant Assistance Agreements with participating landowners for the involved conservation practices.

NOW, THEREFORE, BE IT RESOLVED, that the La Crosse County Board does hereby approve the Lower Black River Watershed Plan and authorizes the County Board Chairman, Land Conservation Committee Chairman and County Conservationist to sign all necessary agreements on behalf of the County which does not obligate the County financially except if otherwise approved, and;

BE IT FURTHER RESOLVED, that a copy of the Lower Black River Watershed Plan be placed on file with the County Clerk.

Dated this 6 Day of June, 1983, at La Crosse, Wisconsin.

LAND CONSERVATION COMMITTEE

Walter Gilbert

Elizabeth Gundersen

William L. Brock

Jerome Sims

Carl Pedretti

Adopted by the La Crosse County Board this 16 Day of June, 1983.

STATE OF WISCONSIN)
COUNTY OF LA CROSSE)SS

I, Russell L. Fiedler, County Clerk of La Crosse County, do hereby certify that the attached resolution is a true and correct copy of the original resolution required by law to be in my custody and which was adopted by the County Board of Supervisors of La Crosse County at a meeting held on the 16 day of June, 1983.

Russell L. Fiedler

Russell L. Fiedler

LA CROSSE COUNTY
DEPARTMENT OF LAND CONSERVATION

• ROOM B05 • COUNTY COURTHOUSE • LA CROSSE, WI 54601

TELEPHONE (608) 784-4156

June 6, 1983

JUL - 1 1983

Carroll D. Besadny
Secretary
Department of Natural Resources
Box 7921
Madison, WI 53711

Dear Mr. Besadny:

The Department of Land Conservation has applied for, and has been approved for funding the Lower Black River Watershed Project under the non-point portion of the Wisconsin Fund.

The Department staff, with cooperation from Trempealeau County Department of Land Conservation and the Department of Natural Resources, has inventoried the Lower Black River Watershed and has set up a procedure for cost-sharing with landowners on various practices to improve water quality within the watershed. The plan has been reviewed by the public during a public hearing which was held on May 5, 1983.

The supervisors of the Land Conservation Committee have also reviewed the plan and have made a motion to approve at the Land Conservation Committee meeting on June 6, 1983.

Sincerely,

Walter N. Gilbert

Walter N. Gilbert
Chairman
Land Conservation Committee

Trempealeau County
Land Conservation Department

AGRICULTURAL SERVICE CENTER, COURTHOUSE, WHITEHALL WISCONSIN 54773
PHONE (715) 538-2311

TREMPEALEAU COUNTY
"Land of Hills and Conservation Practices"

May 23, 1983

To Whom it May Concern:

We have reviewed the Lower Black River Priority Watershed plan. The plan meets our approval and the Trempealeau County Land Conservation Committee will cooperate fully on the implementation of the plan.

Trempealeau County Land
Conservation Committee

Ernest Vold	Ernest H Vold
Ray Nereng	
Ed Pientok	Ed Pientok
Earl Ryder	Earl Ryder
Norman Thompson	Norman S Thompson
Don Forsythe	Donald Forsythe

Working With People and Nature To Improve Our Environment

SUMMARY OF THE LOWER BLACK RIVER WATERSHED PLAN

The Lower Black River Watershed Plan (1) identifies the major nonpoint source control needs for the Lower Black River Watershed and (2) outlines a strategy to implement the best management practices and other recommended actions needed to control the nonpoint sources. The plan was developed jointly by the La Crosse County and Trempealeau County Departments of Land Conservation and the Department of Natural Resources.

Funding for implementation of this plan is from the Wisconsin Nonpoint Source Water Pollution Abatement Program.

The Lower Black River Watershed is located in northwest La Crosse County and southern Trempealeau County. The watershed includes 167 square miles of land draining to the Black River and its tributaries from the confluence with Fleming Creek downstream to the Mississippi River and to Lake Onalaska. It is the downstream most watershed in the Black River Basin. Slightly less than 8 square miles are in urban land use. The remaining rural area is about equally distributed between woodland and agricultural use. Dairy farming is the main agricultural use, with a small number of beef operations occurring throughout the watershed, primarily near the upper reaches of Fleming Creek and along Long Coulee Creek. Small hobby type farms of 20 or less animals occur northeast of Onalaska. In the steep, eastern two-thirds of the watershed, small irregular farm fields are common, with larger more uniform fields in the flatter prairie areas in the western third of the watershed. The potential for increasing urban development pressure is greatest between Onalaska and Holmen.

The major water resources in the watershed are Fleming Creek and Halfway Creek and their tributaries, Grant Creek, Sand Lake Creek and about 17.5 miles of the Black River, as well as Lake Onalaska. For the purposes of implementing this watershed project, the watershed has been divided into nine subwatersheds corresponding to the major tributaries. These subwatersheds are: Upper Fleming Creek, Lower Fleming Creek, Grant-Decorah Prairie, Halfway Creek, Long Coulee, Sand Lake Creek, Van Loon, Amsterdam-Brice Prairie, and Caledonia Prairie.

Biological parameters indicate that the overall water quality within the watershed is generally good. Halfway Creek, Jostad Creek and Creamery Creek support Class III trout fisheries, with the upper reaches of Halfway Creek being a Class II trout stream. The Black River in this stretch supports a good smallmouth bass fishery, and Lake Onalaska has a well balanced bluegill and largemouth bass population. Biotic Index samples on Fleming and Halfway Creeks indicate good to excellent water quality conditions. However, the fish habitat for these streams and their tributaries is degraded by excess cropland and streambank erosion, cattle access to streams and runoff from barnyards. In addition, Lake Onalaska has sediment, algae and rooted aquatic vegetation problems. Sediment from Fleming Creek and Grant Creek carried to the Black River has a detrimental effect on available smallmouth bass feeding and spawning areas in the Black River.

The water quality objectives for the Lower Black River Watershed Project to be reached through the correction of the nonpoint source problems in the watershed include:

1. Improve the existing trout fishery in Halfway Creek, Jostad Creek and Creamery Creek by reducing the sediment and organic loads to the creeks and improving the fish habitat and streambank cover.

2. Protect the smallmouth bass habitat in the stretch of the Black River within the watershed by reducing the sediment and organic material to the Black River from Fleming Creek and its tributaries and from Grant Creek.

3. Contribute to the preservation of the existing warmwater fishery and recreational value of Lake Onalaska while making incremental reductions in the sediment load to the Mississippi River by reducing the sediment load from Fleming Creek, Grant Creek, Black River, Halfway Creek and Sand Lake Creek.

The analysis of information collected for this plan concludes that eroding croplands contribute an estimated 77% of the sediment delivered to the streams, with streambanks, grazed woodlands and pasture on steep slopes contributing about equally to the remaining 23% of the sediment load to the streams. The eroding streambanks have a direct detrimental effect on fish habitat. Barnyard runoff is the major source of organic load to the streams.

Because of the steep topography and high sediment delivery rate and the fact that almost all lands fall within a quarter mile of a perennial or intermittant stream, the priority management area of the watershed, the critical area that contributes the largest percent of the nonpoint source pollutants, includes all the land area in: Upper Fleming, Lower Fleming, Grant-Decorah, Halfway Creek, Long Coulee and Sand Lake Creek subwatersheds. Implementation of best management practices is limited to controlling the significant nonpoint sources within the Priority Management Area. No Best Management Practices are recommended for the Van Loon, Amsterdam-Brice and Caledonia subwatersheds due to their small contribution to water quality problems.

This plan recommends the following actions, in order of importance, for each subwatershed:

For Upper Fleming Creek Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 2,980 acres need improved management.

2. Reduce the organic load from the 22 most critical barnyards ranked high in the barnyard inventory.

3. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 10,540 feet,
   - reducing erosion from grazed woodlands on steep slopes; about 2,700 acres,
   - reducing erosion from steep pasture areas; about 790 acres.

For Lower Fleming Creek Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 2,370 acres need improved management.

2. Reduce the organic load from the 23 most critical barnyards ranked high in the barnyard inventory.

3. Reduce streambank erosion on moderately and severely eroding sites totally about 8,620 feet.

4. Address equally:
   - reducing erosion from steep pasture areas totalling about 900 acres,
   - reducing erosion from grazed woodlands on steep slopes; about 1,860 acres.

For Halfway Creek Subwatershed:

1a. Reduce the organic load from the 30 barnyards ranked high and medium in the barnyard inventory.

1b. Reducing cropland soil loss to no more than 5 T/A/Y; about 2,200 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 15,670 feet,
   - reducing erosion from steep pasture areas; about 140 acres.

3. Co-ordinate implementation of nonpoint source controls with trout stamp and trout habitat work.

For Long Coulee Subwatershed:

1a. Reduce the organic load from the 13 barnyards ranked high and medium in the barnyard inventory.

1b. Reduce cropland soil loss to no more than 5 T/A/Y; about 740 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 4,600 feet,
   - reducing erosion on steep pasture areas; about 130 acres.

For Grant-Decorah Prairie Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 1,440 acres need improved management.

2. Reduce the organic load from the 13 most critical barnyards ranked high in the barnyard inventory.

3. Reduce streambank erosion from moderately and severely eroding sites totalling about 2,000 feet.

For Sand Lake Creek Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 250 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 9,800 feet,
   - reducing erosion from grazed woodlands on steep slopes; about 1,020 acres,
   - reducing erosion from steep pasture areas; about 270 acres.

   Encourage the city of Onalaska to develop a construction runoff and erosion control ordinance which will include single home sites.

The overall cost of the needed best management practices to correct the identified nonpoint source problems in the watershed is estimated to be $2,337,800. Based on cost-sharing rates of 50-70% and a 75% participation rate, about $1,201,600 in cost-share funds is projected to be needed for the Lower Black River Watershed project from the Wisconsin Nonpoint Source Water Pollution Abatement Program.

Installation of the needed best management practices is on a voluntary basis and landowners and municipalities who choose to participate have three years to enter into cost-sharing agreements.

If the plan recommendations are reached and all the critical nonpoint sources identified in the plan are adequately corrected through implementation of this plan, the project could achieve about 57% reduction in the sediment load to the streams and a 71% reduction in the organic load. Of the total sediment load reduction, 83% is estimated to be accomplished by upland erosion control and 17% will be due to streambank erosion control.

The La Crosse County Board acting through the Land Conservation Committee, is the lead designated management agency for the project. The Trempealeau County Board acting through the Land Conservation Committee, and the municipalities of Holmen and Onalaska will also serve as designated management agencies. The Soil Conservation Service will assist the Land Conservation Departments in providing technical assistance to landowners. The University of Wisconsin Extension will assist in educational activities. The La Crosse County ASCS will provide the fiscal management for individual cost-share agreements. Financial aid will be made available to the project from the Wisconsin Nonpoint Source Water Pollution Abatement Program to offset costs associated with technical assistance, educational activities, and fiscal management.

Project progress will be reviewed annually.

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PREFACE

The Lower Black River Watershed was selected in 1981 as a Priority Watershed under the Wisconsin Nonpoint Source Water Pollution Abatement Program. Since the program was enacted by the State Legislature in 1978, twelve other Priority Watersheds have been selected.

There are two general categories of water pollution sources: point sources and nonpoint sources. Point sources cause accute, highly visable water quality impacts. They are generally concentrated discharges of wastewater from distinct sites such as municipal sewage treatment and industrial plants. Nonpoint sources are generally land areas where pollutants are carried to lakes and streams by runoff causing more chronic water quality impacts. Examples of nonpoint sources include stormwater and snowmelt runoff from urban areas, agricultural fields, livestock operations and construction sites. The severity of the impacts of nonpoint sources on water quality generally increases as the extent of land disturbance and the intensity of the land use increases. Point and nonpoint sources require different management schemes to achieve water quality objectives. Point sources require the control of a discrete entity. Control of nonpoint sources requires a comprehensive approach which addresses a number of land management problems over a larger land area, most effectively an entire watershed.

The Wisconsin Nonpoint Source Water Pollution Abatement Program was developed to provide cost-sharing and technical assistance to landowners and operators for the control of nonpoint sources of pollution. It is the primary source of funding available for implementing nonpoint source controls in Wisconsin. The overall purpose of the program is to abate water pollution in watersheds with severely degraded water quality while preserving good water quality in less disturbed watersheds.

Priority watersheds, including the Lower Black River Watershed, are selected, in general, because of the severity of water quality problems in the watershed, the importance of controlling nonpoint sources in order to attain water quality standards, and the capability and willingness of local government agencies to carry out the planning and implementation of the project. The watersheds are selected through a three-step process involving an impartially ranked list of watersheds, regional advisory groups and the State Nonpoint Source Coordinating Committee. Once a Priority Watershed is selected, local agencies, with assistance from the Department of Natural Resources, prepare a watershed plan. The plan, which follows, is divided into two parts. Part one is a technical assessment of existing water quality and watershed conditions followed by the identification of the actions necessary to reduce the water quality problems in the watershed. Part two identifies the tasks necessary to carry out the actions presented in the plan and the agencies responsibilities for each task, as well as the time frame for completing those tasks.

The Lower Black River Priority Watershed Plan was prepared within the framework of the areawide water quality plan (Section 208, PL 92-500) for the Black River Basin. The Priority Watershed Plan is consistent with the basin plan and serves to implement it.

INTRODUCTION

PURPOSE

The purpose of this Priority Watershed Plan is to consolidate water quality and land use information about the Lower Black River Watershed so that the specific causes and critical areas contributing to nonpoint source pollution in the watershed can be identified and the most practical means for abating the pollution can be developed.

The Priority Watershed Plan that follows is divided into two parts. Part 1: The Management Plan, sets the goals and objectives for the watershed project by:

a) assessing the existing water quality problems;
b) identifying the significant nonpoint sources of pollution and determining the significance of other pollution sources such as point sources and septic systems;
c) identifying the water quality improvements or objectives that can be reasonably achieved through nonpoint source controls;
d) identifying the priority management area and the best management practices which will be effective in abating the nonpoint source pollution; and
e) estimating the cost-share dollars needed to implement the recommended nonpoint source control needs.

Part II: The Implementation Strategy, outlines the process for achieving the project objectives. It identifies:

a) the tasks necessary to accomplish the needs identified in the Management Plan;
b) the agencies responsible for carrying out those tasks;
c) the time frame for carrying out the tasks; and
d) the estimated hours of staff needs for carrying out the project.

In addition to the above purposes, the Priority Watershed Plan has several other uses. Because the plan represents a thorough inventory of pollution sources and control needs within the watershed, it can be used to pinpoint critical areas of the watershed where other resource management efforts can be directed. It can also serve an important educational function by showing the cause and effect relationship between land management and water quality. The plan is a guide for managing the watershed project and details procedures and responsibilities to aid staff in working more effectively. And, finally, the Watershed Plan can serve as an application for other state and federal funding programs which may become available.

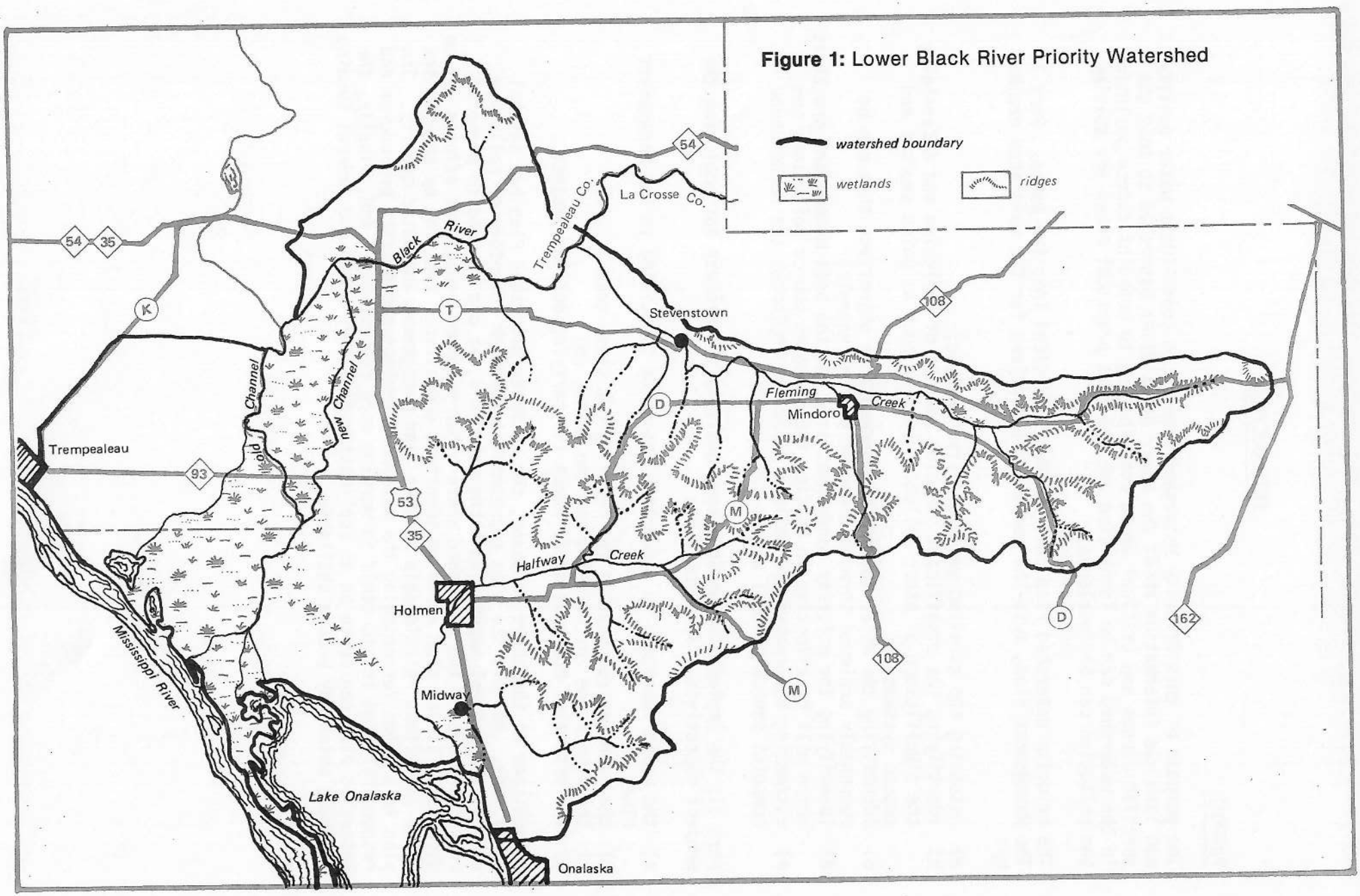


Figure 1: Lower Black River Priority Watershed

PART I: THE MANAGEMENT PLAN

WATERSHED DESCRIPTION

The Lower Black River Watershed is located in northwest La Crosse County and southern Trempealeau County. The watershed includes 167 square miles of land draining to the Black River and its tributaries from the confluence with Fleming Creek downstream to the Mississippi River and to Lake Onalaska. It is the downstream most watershed in the Black River Basin and comprises about 7% of the overall Black River Basin. The major tributaries in the watershed are Fleming Creek, Halfway Creek, Long Coulee and Sand Lake Coulee in La Crosse County and Tank Creek and Grant Creek in Trempealeau County. The watershed has been divided into nine subwatersheds based on these tributaries, topography and land use. A map of the overall watershed is shown in Figure 1 and the subwatersheds are shown in Figure 2.

The La Crosse County portion of the watershed is about 137 square miles (about 82% of the watershed area) and includes the Village of Holmen and a portion of the City of Onalaska. The remaining 30 square miles (18%) of the watershed is in Trempealeau County. Holmen (population: 2,411, 1982 census) is the only incorporated area entirely within the watershed. The Cities of La Crosse (population: 48,347) and Onalaska (population: 9,429) are immediately south of the watershed. The overall watershed population is about 10,200 people based on the most recent census (1982).

The Lower Black River Watershed is located in the driftless, unglaciated portion of Wisconsin. The surface relief of the eastern two-thirds of the watershed is characterized by steep coulee terrain of narrow Upper Cambrian sandstone ridges dissected by narrow stream valleys. The slopes lessen somewhat and become more rolling between the uplands and the level bottom lands of the Black River. The major soils for all of the Long Coulee subwatershed and most of the Upper Fleming, Lower Fleming, Halfway, Sand Lake, and Grant-Decorah subwatersheds are silt loams on the ridgetops (Fayette) and sideslopes (Gale; LaFarge) with sandy loams (Hixton; Eleva) on the lower, convex slopes, giving way to silty soils on the nearly level floodplains. The silty soils on the floodplains are generally more productive than the upland soils. The soils become sandier on the rolling hills at the downstream areas of the Lower Fleming subwatershed (Boone, Hixton) and more level valley benches of the downstream areas of the Halfway, Sand Lake and Grant-Decorah subwatersheds (Plainfield, Sparta; Downs). These soils are well drained and very susceptable to water erosion, especially on steeper slopes and where gullies have cut into the sandy subsoils. The agriculture is primarily dairying in this area of the watershed. Most of the farming occurs on the steep valley slopes with the farms often located directly adjacent to the streams. The fields are generally small and irregularly shaped.

The surface relief of the western one-third of the watershed is nearly level prairie areas created by the Black River delta and Mississippi River Valley benches. The wet Black River bottom lands divide the Caledonia Prairie from the Amsterdam Prairie. The soils are primarily loamy sands and fine sands (Plainfield, Sparta; Dickinson, Gotham) transported from the sandy uplands by the streams. They are droughty, easily erodible and are generally low in

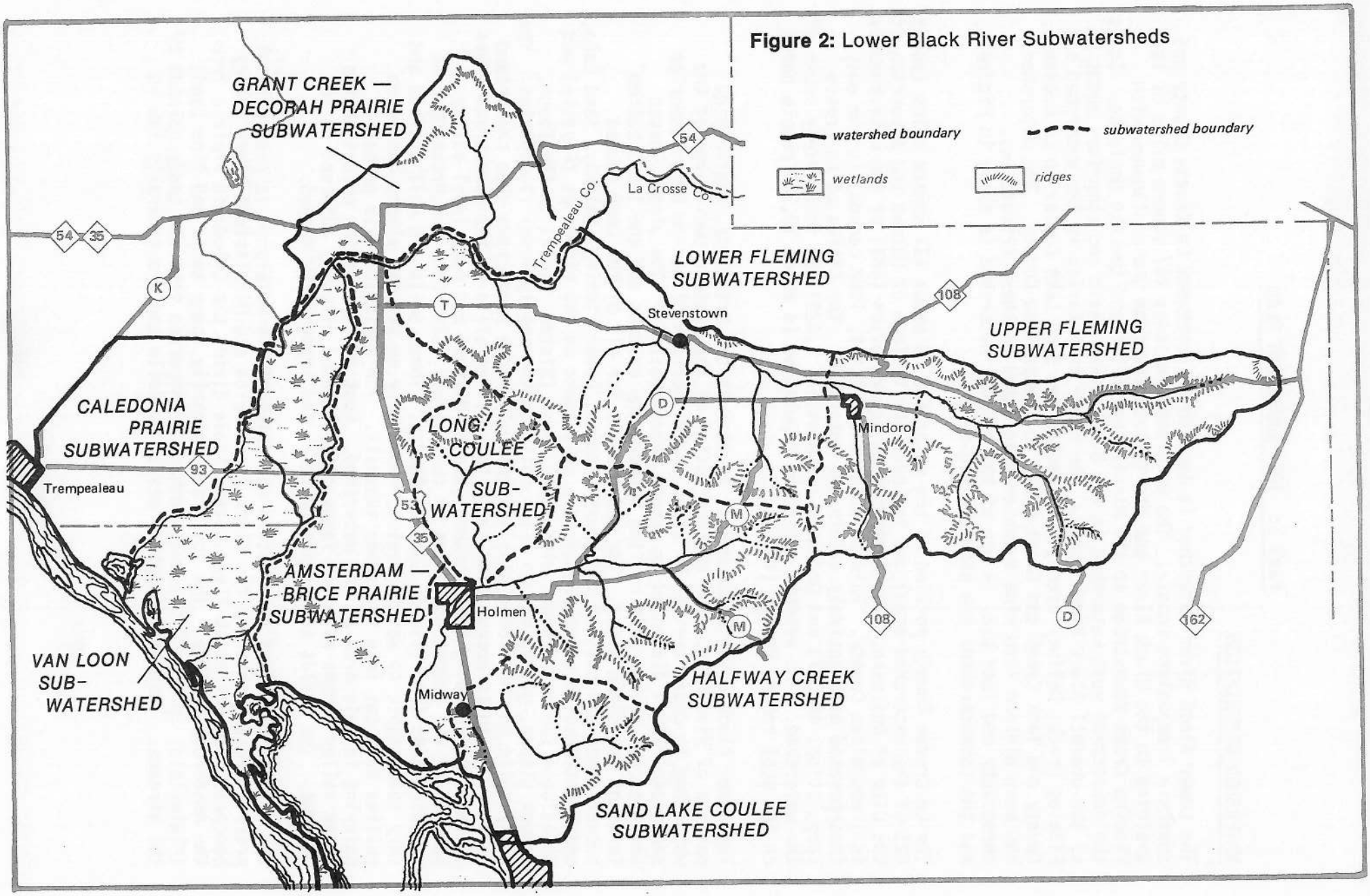


Figure 2: Lower Black River Subwatersheds
watershed boundary
subwatershed boundary
wetlands
ridges
GRANT CREEK — DECORAH PRAIRIE SUBWATERSHED
LOWER FLEMING SUBWATERSHED
UPPER FLEMING SUBWATERSHED
CALEDONIA PRAIRIE SUBWATERSHED
LONG COULEE SUB-WATERSHED
AMSTERDAM — BRICE PRAIRIE SUBWATERSHED
VAN LOON SUB-WATERSHED
HALFWAY CREEK SUBWATERSHED
SAND LAKE COULEE SUBWATERSHED
Trempealeau Co.
La Crosse Co.
Stevenstown
Mindoro
Trempealeau
Holmen
Midway
54
35
K
T
D
M
108
93
53
162

fertility except where organic material has been added by past flooding. The farm fields in this area are larger, more regularly shaped and more suited for cash cropping than those of the uplands. The Black River flood plain is too wet for agriculture and used primarily as wildlife habitat.

The Lower Black River Watershed has a humid-continental type climate marked by wide temperature extremes. The winters are cold and snowy and the summers are warm and frequently humid. Both the spring and fall seasons are relatively short. The average growing season ranges from 163 days in La Crosse County to 128 days in Trempealeau County, and occurs from late April/early May to late September/early October. The average annual rainfall is 28.9 inches in La Crosse County and 31.2 inches in Trempealeau County. Most of the rainfall occurs from May to September, with June having the highest average precipitation.

The land use in the Lower Black River Watershed is predominately rural. Forty-one percent of the land is used for agriculture and 44% is woodland, with wetlands, farmsteads and urban comprising the remaining 15%. Dairy farming is the major agricultural use throughout the watershed, with some cash cropping, primarily corn and soybeans, in the prairie areas. In addition, there are some miscellaneous scattered beef operations. There are about 14,600 livestock animal units (with 1 animal unit = 1,000 lbs. of live weight) in the Lower Black River Watershed, according to town assessors data.

Because land use has a significant impact on water quality, a more detailed analysis of the watershed landuse and water quality impacts is presented later in this plan with the watershed inventory results.

DESCRIPTION OF WATER RESOURCES AND PROBLEMS

The major streams in the Lower Black River Watershed are Fleming Creek and Halfway Creek. Other areas of the watershed also drain directly to the Black River and Lake Onalaska. The streams and lakes of the Lower Black River Watershed are shown in Figure 3. Because of the steep coulee topography there are a number of tributaries to each of the major streams. Many of these tributaries are flashy and have intermittant flows during part of their reaches or during drier months of the year.

The streams, lakes, fisheries and water quality problems are discussed below. Figure 4 shows the sampling sites from which the water quality information was collected. Table 1 summarizes the physical characteristics of the streams and lakes and Table 2 lists the biological characteristics.

As part of the biological sampling, Biotic Index samples were collected at the locations shown in Figure 4. The Biotic Index is a technique developed to determine the amount of stress on the aquatic communities in a stream by sampling and assessing the relative abundance of tolerant and intolerant insects (macroinvertebrates). The stress is associated with the overall quality of the water but is not specific to any single factor. The Biotic Index gives a numerical value for each site ranging from 0 to 5 and can be interpreted according to the scale shown in Table 2.

Figure 3: Streams and Lakes in the Lower Black River Watershed

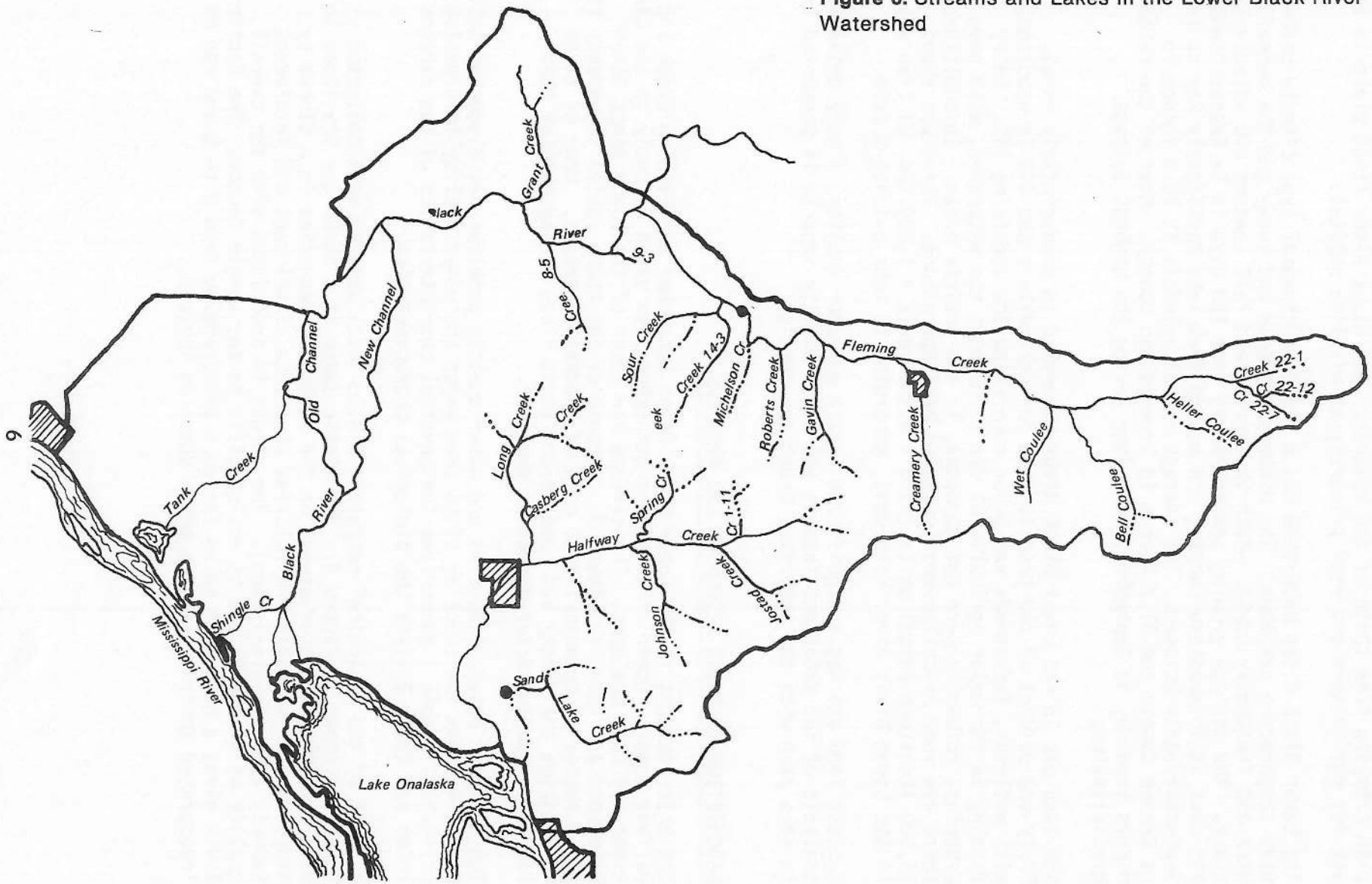
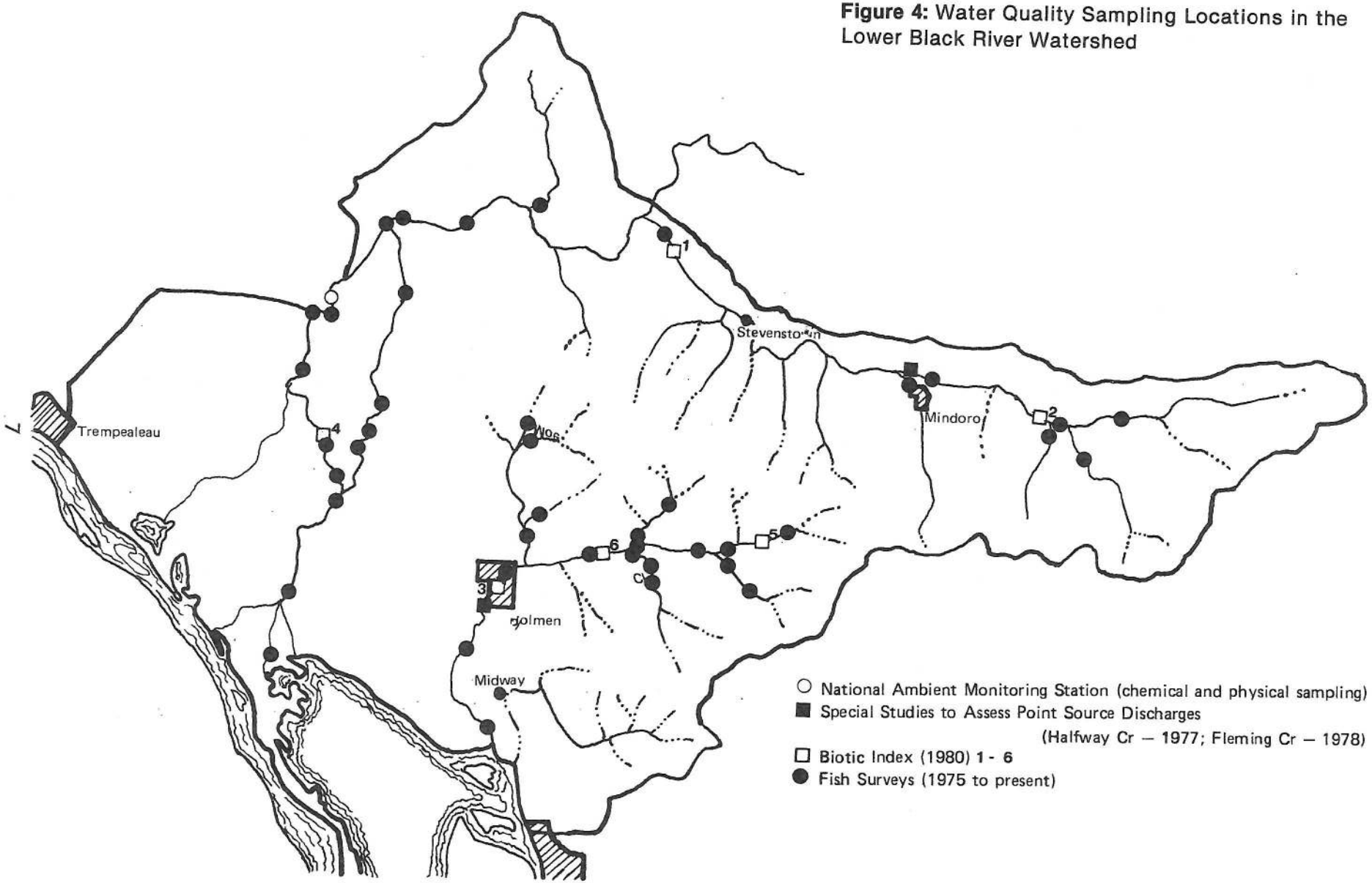


Figure 4: Water Quality Sampling Locations in the Lower Black River Watershed



Streams supporting trout and smallmouth bass fisheries are shown in Figure 5. For purposes of the following discussion, the streams and lakes are grouped by sub-watershed (refer to Figure 2).

1. Upper and Lower Fleming Creek Subwatersheds:

   Fleming Creek is a tributary to the Black River which originates in the steep coulee region east of Mindoro. The stream is approximately 17 miles long, averages 17 feet wide and has an overall gradient of 25 feet/mile. The bottom is primarily sand with small amounts of silt, boulder and rubble. The general water quality is good, but the stream supports only a forage fishery, including creek chubs, white suckers and several species of shiners and minnows. Lack of adequate habitat due to eroding bank cover and silt deposits appears to be the factor limiting the fishery.

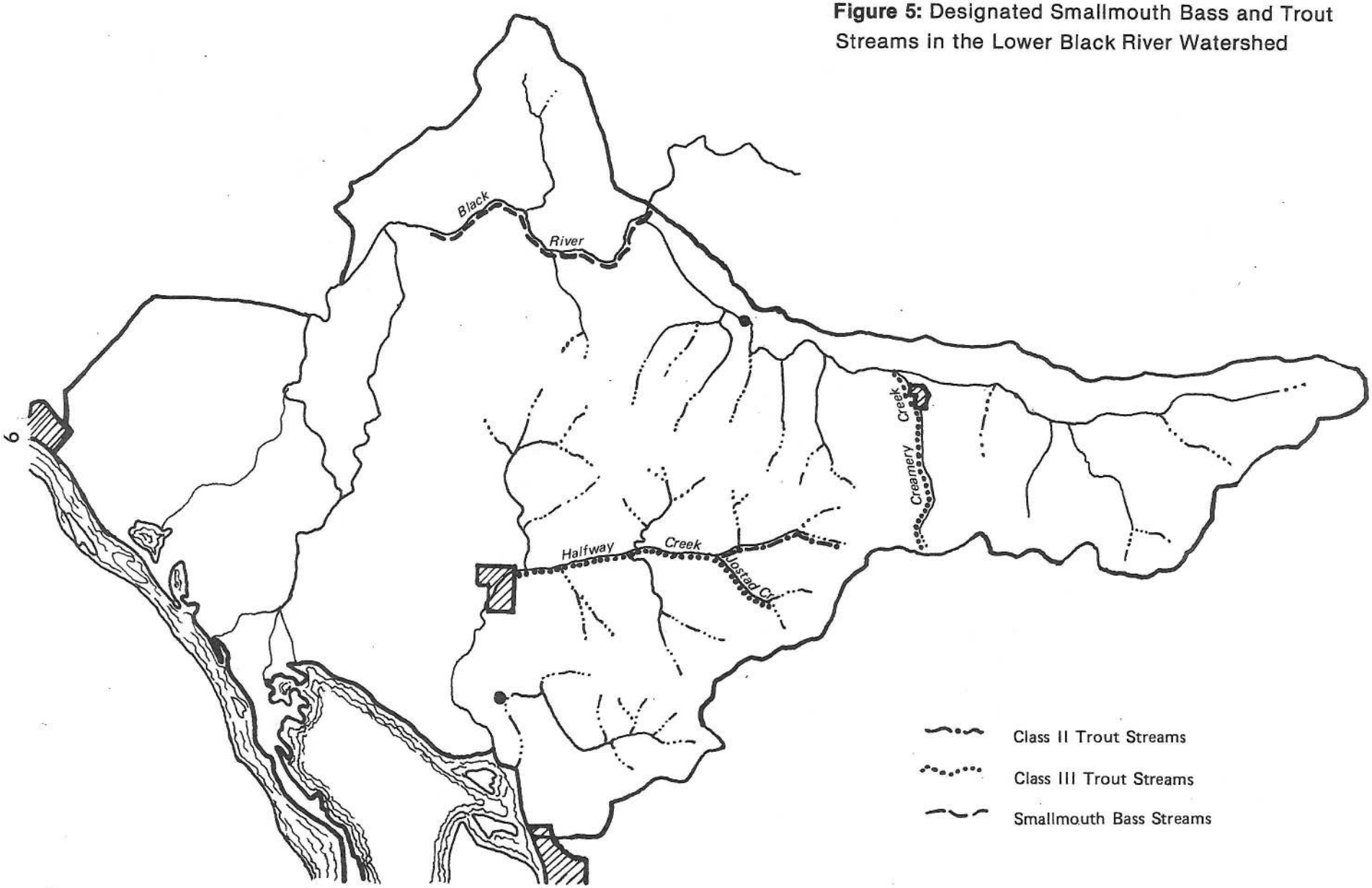
   a. Upper Fleming Creek Subwatershed - At its upper reaches, Fleming Creek is narrower and has a steeper gradient than further downstream. Biotic Index sampling near Mindoro indicated very good to excellent water quality. Water samples collected near the same location show adequate dissolved oxygen and moderate levels of suspended sediments and oxygen demanding organic materials. However, fecal coliform bacteria were occasionally found to be high upstream from Mindoro. In addition, ammonia levels were occasionally high below the Mindoro Wastewater Treatment Plant, the only point source on Fleming Creek.

      Past reports have indicated that cattle access to springs and streambanks, as well as cropland erosion, are potential problems in this sub-watershed. Cattle access to springs would tend to increase water temperature extremes and, along with erosion, increase the sediment entering the stream. Sediment deposits and destruction of streambank cover reduce available fish habitat including reproduction sites, protection and food sources. DNR Fish Managers feel there is a moderate potential to improve the fishery of Fleming Creek upstream from Mindoro to a Class III trout fishery with nonpoint source controls and fish habitat work.

      Creamery Creek (Creek 20-1) in Severson Coulee at Mindoro is a Class III trout stream for all of its 3.9 mile length. The stream has a high gradient and sand bottom, and the watercress present indicates good, cold water conditions. Barnyards located adjacent to the stream have been cited as a potential source of organic materials to the stream. The organic materials can cause ammonia toxicity to fish and eggs and reduce available food organisms. It is perceived that the fishery could be returned to a naturally reproducing Class I or II trout fishery with the implementation of barnyard runoff controls and improvement of fish habitat.

      The remaining tributaries in the Upper Fleming Creek sub-watershed are short, high gradient, low flow streams that tend to be turbid and flashy after rain storms. Sand is the main bottom type, with varying amounts of silt present. Forage species comprise the fishery. Of

Figure 5: Designated Smallmouth Bass and Trout Streams in the Lower Black River Watershed



these tributaries, Bell Coulee Creek appears to have the greatest potential for improved fishery, with pastured streambanks observed to be a major concern.

b. Lower Fleming Creek Subwatershed - Downstream from Mindoro, Fleming Creek widens and the gradient lessens. Biotic Index values indicate good to very good water quality conditions. As with the remaining tributaries in this sub-watershed, forage fish species are present. Several of the tributaries are quite turbid and silt deposits are evident, particularly in Gavin Coulee Creek and where Fleming Creek enters the Black River. The silt deposited in the Black River fills in smallmouth bass habitat. Resource management personnel have cited the area west of Mindoro as having severe cropland erosion problems, particularly where continuous corn is grown on steep slopes.

   There are two small lakes in the subwatershed which fall in the Black River floodplain and their water quality and fishery are determined by that of the Black River.

2. Grant-Decorah Subwatershed:

   Grant Creek drains the steep eastern portion of this sub-watershed, while the more level Decorah Prairie area in the west drains directly to the Black River. Grant Creek is 3.8 miles long, has a high gradient of 44 feet/mile, a sand bottom, with some silt and supports a forage fishery. The stream runs turbid after storms and deposits silt at its confluence with the Black River. Cattle access to the stream, particularly at barnyard areas, appears to be common. The one small lake present in the sub-watershed lies within the Black River floodplain.

3. Halfway Creek Subwatershed:

   Halfway Creek originates in Sweden Coulee and flows 11 miles through Holmen to Lake Onalaska. The stream averages eight feet wide, has a fairly high gradient of 19 feet/mile and a sand bottom with considerable silt. Above Holmen it is a designated trout stream with 5.5 miles of Class III trout waters and 1.5 miles of Class II trout waters, with abundant white suckers also present. Biotic Index sampling above Holmen showed a well balanced aquatic macroinvertebrate community indicative of very good to excellent water quality. However, water chemistry sampling showed excessive fecal contamination and high concentrations of nutrients, suspended solids and oxygen-demanding organic material. Halfway Creek was identified as a major source nutrient input to Lake Onalaska by a 10-year water chemistry survey of Pools 7 and 8 of the Mississippi River (Dawson, 1982). The high levels or organic materials and high sediment load have detrimental effects on both the in-stream fishery growth and reproduction and on Lake Onalaska. The good Biotic Index values indicate adequate stream flow, temperature and dissolved oxygen conditions such that the fishery would benefit from a reduction in the sediment and organic material load. Streambank pasturing, barnyard runoff, cropland erosion and erosion on unvegetated construction sites have all been cited as potential problems. The fishery improvement potential is good and appears to be best near the junction of Sweden and Jostad Coulees.

Of the tributaries to Halfway Creek, Jostad Coulee supports a Class III trout fishery, along with creek chubs and johnny darters, while Johnson Creek and Creek 1-11 support small numbers of forage species. Jostad Creek appears to have good potential to show improved naturally reproducing trout populations with rejuvenation of habitat by reductions in organic material and sediment load and improvements in cover. Observed problems along the tributaries include sediment deposits where Johnson Coulee junctions with Halfway Creek and cattle pasturing of springs.

5. Long Coulee Subwatershed:

Long Coulee Creek is the major tributary to Halfway Creek. It is 3.9 miles long and, similar to its two tributaries, is turbid with a silty stream bottom and supports a forage fishery. It is possible that the source of the high sediment load in the streams may be excess cropland erosion and pastured streambanks observed in the subwatershed. Sediment from Long Coulee Creek can be washed into Halfway Creek and have negative impacts on the limited trout habitat.

6. Sand Lake Coulee Subwatershed:

Sand Lake Creek drains the coulee area east of Midway and Onalaska then normally infiltrates into the ground when it reaches the sandy soils near HWY 53-35. Further downstream the flow resumes somewhat, primarily due to groundwater inputs. During times of high flow, the entire length of the stream becomes a tributary to Lake Onalaska. Similar to other watershed streams, it has a good gradient, sand bottom and forage fishery. Significant areas of the subwatershed are internally drained and do not contribute to surface water flow. There is little water quality information available on Sand Lake Creek, but it often runs turbid. The area draining to the stream is urbanizing rapidly and there is considerable potential for erosion from construction sites and alteration of stormwater runoff routes to be an increasing cause of water quality problems.

7. Van Loon Subwatershed and Black River:

   a. Black River - The stretch of the Black River that flows through the Lower Black River Watershed is about 17.5 miles long. Where the river enters the watershed, the channel is more defined by the steep topography than further downstream where the path becomes diffuse with a fairly low gradient and the river enters the north end of Lake Onalaska. The sandy stream bottom also has considerable amounts of gravel, rubble, silt and muck. Biotic Index sampling shows macroinvertebrate populations representing good to very good water quality. Water quality sampling indicates that dissolved oxygen levels are consistently higher than the 5 mg/l necessary to support a warmwater fishery. However, phosphorus, nitrogen and suspended sediment levels fluctuate from moderate to high indicating fertile stream water quality conditions.

Within the Lower Black River Watershed the Black River is identified as a state smallmouth bass stream upstream from Highway 53-35. The river also supports populations of northern pike, walleye, largemouth bass, bluegills, channel catfish and black crappies, especially in the downstream areas near the Mississippi River. The major water quality concern for this stretch of the Black River is the high sediment load, particularly with the addition of the sediment carried in by Fleming and Grant Creeks. The sediment reduces the smallmouth bass habitat within the river by covering spawning and feeding grounds as well as causes problems in Lake Onalaska, where it is eventually deposited.

b. Van Loon Subwatershed - The Van Loon Subwatershed is entirely defined by the braided Black River channel, including Tank and Shingle Creeks, as they wind through over 1,600 acres of wetlands to Lake Onalaska and the Mississippi River. The water quality and fishery of the numerous channels and the small lakes are similar to the Black River, as well as the Mississippi River where the rivers junction. Largemouth bass, bluegills, northern pike and other warmwater species comprise the fishery. The vast majority of the land area is comprised of various types of wetlands which are in public ownership and managed for fish and wildlife use. The publicly owned Van Loon State Public Hunting Grounds and the Upper Mississppi River Wildlife and Fish Refuge comprise most of these lands.

8. Caledonia Subwatershed:

There are no streams in the Caledonia Subwatershed and the five lakes present, called the Trempealeau Lakes, lie within the Mississippi River floodplain. The lakes all support a warmwater sport fishery typical of the Mississippi River. They experience varying degrees of turbidity, algae and winterkill problems.

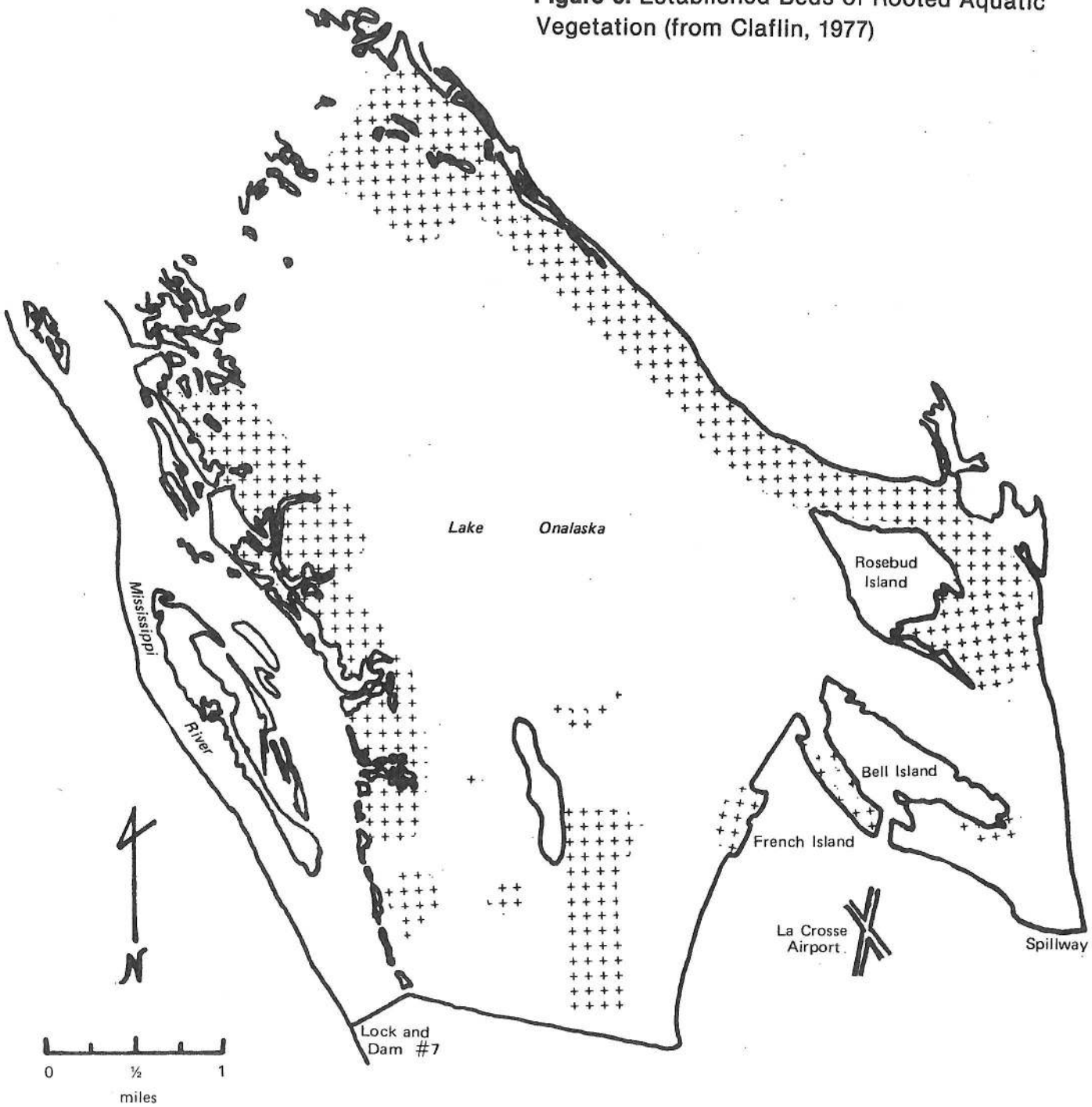
9. Lake Onalaska:

Lake Onalaska is a shallow 5,400 acre impoundment comprising about half of Pool 7 on the Mississippi River. The major sources of water to the lake are the Mississippi and Black Rivers. Halfway and Sand Lake Creeks contribute small volumes during high flow. The lake averages 5 feet deep and has a sand bottom except in the near shore areas where layers of muck and detritus have built up.

The water chemistry of Lake Onalaska is similar to the Mississippi River. It has nutrient levels high enough to cause algae blooms and dense stands of rooted aquatic vegetation, as shown in Figure 6. The high algae and sediment loads made the lake quite turbid. The lake does not stratify and the dissolved oxygen leels are sufficient to support a warmwater fishery and avoid winterkills, except in a few isolated areas.

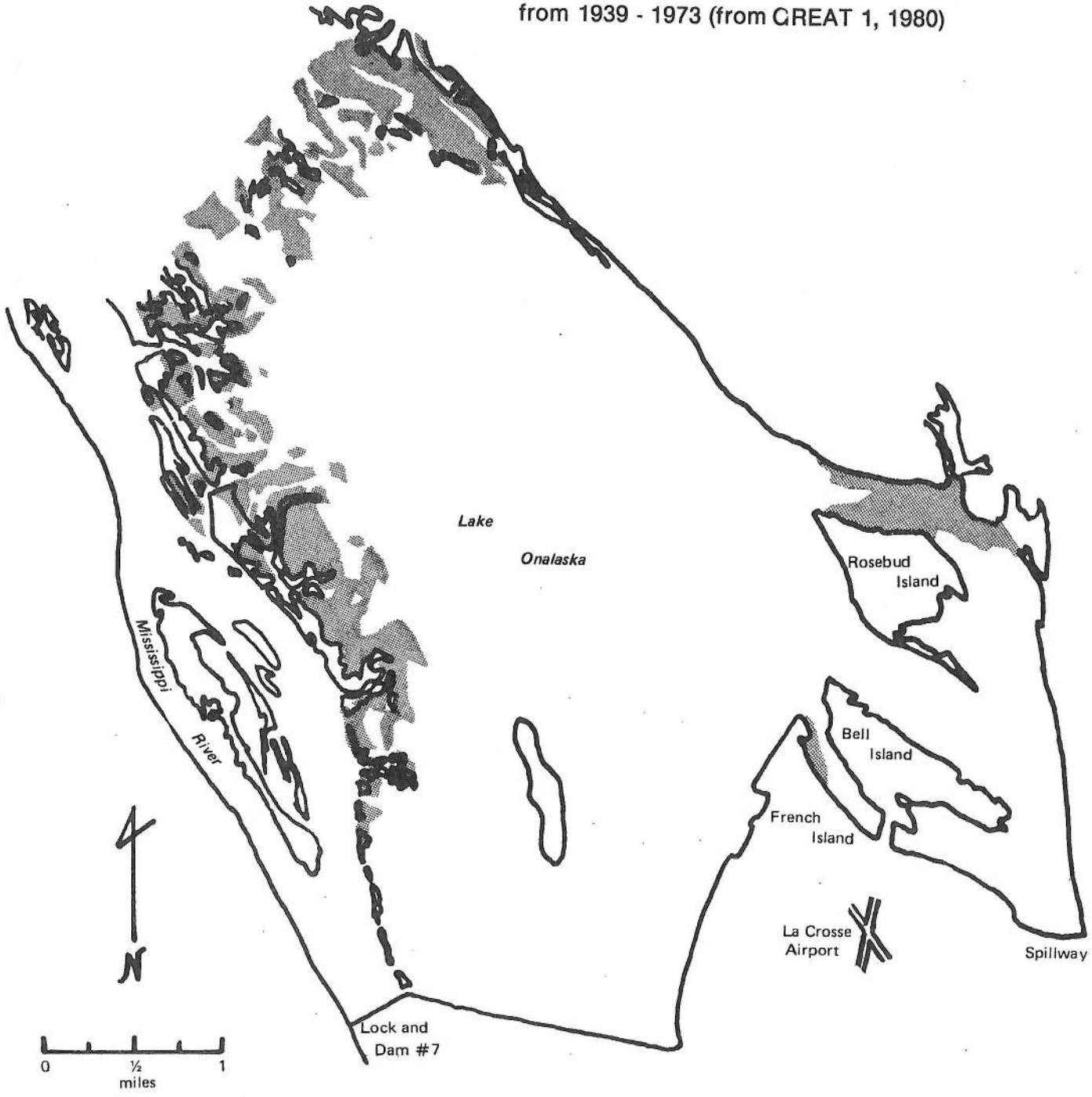
Lake Onalaska supports a good fishery of bluegills, largemouth bass, bullhead and catfish (totalling over 40 species). The shallowness, fertility and available food and cover of the lake are well suited for a

Figure 6: Established Beds of Rooted Aquatic Vegetation (from Claflin, 1977)



healthy, well balanced population of largemouth bass and bluegills. Carp are harvested commercially. The excess algae and aquatic vegetation problems, which appear to be worsening and require treatment for control, are symptoms of the major water quality problem of the lake which is its high sediment load. There has been an estimated loss of 31% of the lake volume in the last 40 years due to sedimentation (see Figure 7). The sediment contributed from the Black River, Halfway Creek and Sand Lake Creek, especially after major storms, aggravates the problem. Even though the general flows of Halfway Creek and Sand Lake Creeks are low, their contribution to Lake Onalaska sediment problems can be significant because runoff during intense storms is very high in suspended sediment (Claflin, 1970). Eventually, the existing good fishery will be shifted to favor an over-populated, stunted bluegill fishery as increasing areas of the lake become shallow enough to grow aquatic vegetation, leading to increased accumulations of muck and detritus, which has the potential to cause more severe winterkills.

Figure 7: Loss of Open Water Area in Lake Onalaska from 1939 - 1973 (from GREAT 1, 1980)



Loss of open water area to emergent aquatic vegetation based on comparison of 1939 and 1973 aerial photographs. Emergent aquatic vegetation areas correlate with locations of fine sediment deposition.

TABLE 1: Water Resources - Physical Characteristics[1]

SUBWATERSHED Stream or Lake	Stream Length or Lake Acres	Stream Gradient or Lake Depth	Stream Flow[2] (cfs)	Lake Drainage[3]	Bottom Substrate[4]	Public Access
UPPER FLEMING						
Fleming Cr.	9.6 mi	25'/mi	11.3		SAND; boulder, silt, rubble, gravel, clay	X
Cr. 22-1	.6 mi	200'/mi	.04		SILT; Silt; gravel	2X
Cr. 22-12	.5	150'/mi	.1		GRAVEL; Rubble & Sand; boulder and sand	X
Cr. 22-7	.5 mi	150'/mi	.4		GRAVEL; Sand & Boulder; rubble & silt	4X
Heller (Cr 20-11)	1.6 mi	150'/mi	.2		SAND; gravel, rubble, clay & silt	3X
Bell (Cr 25-8)	3.5 mi	62'/mi	1.4		SAND; gravel, rubble & silt	4X
Wet (Cr 26-1)	2.7 mi	80'/mi	.5		SAND; Gravel; rubble & boulder	--
Creamery (Cr 20-1) (Severson)	3.9 mi	63'/mi	2.1		SAND; Gravel; rubble & silt	4X
LOWER FLEMING						
Fleming	7.6 mi	25'/mi	11.3		SAND; boulder, silt, rubble, gravel, clay	X
Gavin (Cr 18-15)	2.3 mi	40'/mi	1.1		SILT; Sand & Gravel; clay, muck & rubble	3X
Roberts (Cr 24-1)	1.8 mi	35'/mi	.5		SAND: Silt & Detritus; gravel	2X
Cr. 14-3	2.1 mi	46'/mi	1.1		SAND; silt & gravel	X
Sour	2.6 mi	37'/mi	2.6		SAND: Silt; clay	3X
Cr. 903	.5	100'/mi	.4		SAND; Gravel; rubble & boulder	--
Ponstad Berg (Cr 8-5)	2.0 mi	63'/mi	1.2		SAND: Gravel & Silt; rubble, boulder & muck	--
Lake 6-8	1.3 ac	6'		seepage		--
Lake 6-7	.05 ac	3.5'		seepage		--
GRANT-DECORAH						
Grant (Cr 6-4)	3.8 mi	44'/mi	1.97		SAND; Silt & Detritus; gravel	5X
Lake 6-1	5.5 ac	3'		drainage		
HALFWAY						
Halfway Cr	11.3 mi	19'/mi	7.5		SAND; Silt; clay & gravel	X
Cr. 1-11	.7 mi	67'/mi	.2		SAND; Silt	1X
Jostad (Cr 11-1)	2.2 mi	61'/mi	1.5		SAND; Silt; gravel & rubble	2X
Spring Coulee	2.0 mi	31'/mi	.6		SAND & SILT; detritus	2X
Johnson (Cr 3-11)	3.1 mi	64'/mi	.8		SAND; Gravel; rubble & boulder	
LONG						
Long (Cr 8-6)	3.9 mi	26'/mi	1.0		SILT; sand	3X
Moe (Cr 31-2)	1.1 mi	33'/mi	.7		SILT; sand	3X
Casberg (Cr 5-7)	1.2 mi	50'/mi	.1		SILT; Gravel; sand & clay	2X

SUBWATERSHED Stream or Lake	Stream Length or Lake Acres	Stream Gradient or Lake Depth	Stream Flow[2] (cfs)	Lake Drainage[3]	Bottom Substrate[4]	Public Access
SAND LAKE						
Sand L. (Cr 20-10)	5.8 mi	24'/mi	.5			2X
VAN LOON						
Shingle	1.4 mi	n.a.	n.a.		SAND; silt	X
Tank Cr.	3.7 mi	6'/mi	n.a.		SAND & SILT; detritus, muck, clay & gravel	2X
Van Loon Lake	23.3 ac	3'		seepage		X
L. 22-8bb	.3 ac	8'		seepage		X
L. 22-7	1.7 ac	20'		seepage		X
L. 22-8bc	.4 ac	14'		seepage		
CALEDONIA						
First Lake	17.3 ac	2.5'		spring		--
Second Lake	23.5 ac	7'		drainage		X
Third Lake	29.2 ac	8'		drainage		X
Round Lake	40.1 ac	7'		drained		X
Long Lake	21.6 ac	11'		drained		X
BLACK RIVER (within watershed)						
Main Channel	17.5 mi	1.9'/mi	1635		SAND; silt, muck, clay, gravel & rubble	X
Old Channel	8.0 mi	(Same)	n.a			
LAKE ONALASKA	5,400 ac	5'			SAND; Silt & Muck; gravel, clay & rubble	6X

[1]Compiled from Surface Water Resources of La Crosse County, 1971 and Surface Water Resources of Trempealeau County, 1970.

[2]Stream flows are mostly from late fall 1969 and early spring 1970 and are included for general comparison of stream sizes.

[3]Lake drainage types:
Drainage - a lake that has an inlet and outlet.
Drained - a lake that has no inlet, but has an outlet with very low flow.
Seepage - a landlocked lake that receives most of its water from groundwater seepage.
Spring - a lake that has no inlet, but has an outlet with substantial flow.

[4]Bottom subrate components are listed in order of importance.

TABLE 2: Water Resources - Biological Characteristics

SUBWATERSHED Stream or Lake	Biotic Index[1] Spring/Fall 1980	Fishery[2]	Potential To Improve Fishery[3]	Problems	Comments
UPPER FLEMING					
Fleming	Site 2: 1.36/1.99	Forage	Mod.-upstream from Mindoro	High fecal coliforms & ammonia	115 ac adj. wetlands
Cr. 22-1		Forage			
Cr. 22-12		Forage			
Cr. 22-7		Forage			
Heller (Cr. 20-11)		Forage			
Bell (Cr. 25-8)		Forage	Mod.		
Wet (Cr. 26-1)		Forage			
Creamery (Cr. 20-1) (Severson		Trout (Class III-3.9 mi)	Good-class I trout potential		
LOWER FLEMING					
Fleming	Site 1: 2.33/2.04	Forage	Silty streambottom		
Gavin (Cr. 18-15)		Forage	High turbidity		
Roberts (Cr. 24-1)		Forage			
Cr. 14-3		Forage			
Sour		Forage			
Cr. 9-3		Forage			
Ponstad Berg (Cr. 8-5)		Forage			
Lake 6-8		NP, BG, P, C, Forage	Winterkill		In Black R. Floodplain
Lake 6-7		NP, P, Forage	Winterkill		In Black R. Floodplain
GRANT-DECORAH					
Grant (Cr. 6-4)		Forage			81 ac. adj. wetlands
Lake 6-1		Forage		Winterkill, low transparency, high algae	40 ac. adj. wetlands In Black R. Floodplain
HALFWAY					
Halfway Cr.	Site 6: 1.20/2.02 Site 5: 1.36/1.99 Site 3: 1.78/2.70	Trout (Class II-1.5 mi upstream from CTH W/Class III-5.5 mi upstream from CTH DH	Good	High turbidity after storms; high fecal coliforms & nutrients	96 ac. adj. wetlands
Cr. 1-11		Forage			
Jostad (Cr. 11-1)		Trout (Class III-2.2 mi)	Good	Elevated temperatures, high turbidity	
Spring		Forage			Private ponds on Creek
Johnson (Cr. 3-11)		Forage	Mod.-for Class III		Causes sediment delta in Halfway Cr.

SUBWATERSHED Stream or Lake	Biotic Index[1] Spring/Fall 1980	Fishery[2]	Potential To Improve Fishery[3]	Problems	Comments
LONG					
Long (Cr. 8-6)		Forage	Mod.	High turbidity	
Moe (Cr. 31-2)		Forage	Mod.		
Casberg (Cr. 5-7)	Forage				
SAND LAKE					
Sand Lake Cr.		Forage			Often intermittant below STH 35-53
TAN LOON					
Shingle Cr.		NP, LMB, P, Forage			92 ac. adj. wetlands, tribe. to Mississippi
Tank Cr.		LMB, BG, P, Forage			1,320 ac. adj. wetlands
Van Loon L.		NP, LMB, P, BG		Winterkill	99 ac. adj. wetlands, in Black R. floodplain, wildlife use, public land
L. 22-8bb		NP, BG, P, C, Forage		Winterkill	In Black R. floodplain
L. 22-7		NP, LMB, BG, P, C, Forage		Winterkill	In Black R. floodplain
L. 22-8bc		NP, BG, P, C, Forage		Winterkill	In Black R. floodplain
CALEDONIA					
First L.		NP, SMB, LMB, BG, P		Algae	In Mississippi floodplain
Second L.		NP, SMB, LMB, BG, P			In Mississippi floodplain
Third L.		NP, LMB, BG, P			In Mississippi floodplain
Round L.		NP, LMB, BG, P		Winterkill	In Mississippi floodplain
Long L.		NP, LMB, BG, W, CC		Winterkill	In Mississippi floodplain
BLACK RIVER	Site 4: 2.03/1.86	SMB, W, NP, CC, P, Forage		High sediment load	1,540 ac. adj. wetlands
LAKE ONALASKA		LMB, BG, P, C. Forage		Aquatic plants & algae, turbid, loss of vol.	2,000 ac. adj. wetlands

[1]Class of Water Quality According to the Biotic Index:

Biotic Index	Water Quality	Degree of Organic Pollution
0.00 - 1.75	Excellent	No organic pollution
1.76 - 2.25	Very Good	Possible slight organic pollution
2.26 - 2.75	Good	Some organic pollution
2.76 - 3.50	Fair	Significant organic pollution
3.51 - 4.25	Poor	Very significant organic pollution
4.26 - 5.00	Very Poor	Severe organic pollution

(continued)

(TABLE 2 continued)

[2]Fishery Codes:

P - panfish includes bluegill, pumpkinseed, green sunfish, rock bass, crappie, perch & bullhead.
Forage - includes dace, chub, shiner, sucker & redhorse
Trout Class I - good natural reproduction, no stocking.
Class II - some natural reproduction, some stocking
Class III - no natural reproduction, annual stocking
LMB - Large Mouth Bass
SMB - Small Mouth Bass
NP - Northern Pike
W - Walleye
BG - Bluegill
C - Carp
CC - Channel Catfish

[3]"Potential to Improve Fishery" information included where available, based on perceptions of DNR Fish Management and Water Resources Management personnel from watershed tour.

PUBLIC USE OF WATER RESOURCES

Fishing is the most common recreational use of the lakes and streams in the Lower Black River Watershed. A variety of fish species attract anglers to different areas of the watershed: trout draw fishermen to Halfway Creek, Jostad Creek, or Creamery Creek; those seeking bluegills, largemouth bass or walleye head for Lake Onalaska; and smallmouth bass attract fishermen to the Black River. Other water related public uses of the watershed include: waterfowl and small game hunting, canoeing, primitive canoe camping, hiking, picnicing, bird watching and educational/scientific activities. These activities primarily occur in the Van Loon Public Hunting and Upper Mississippi Wildlife and Fishing areas and, with the additional of water skiing, on Lake Onalaska.

1. Current Use - The actual number of people who take advantage of these activities each year is difficult to quantify. There are approximately 200,000 people in Wisconsin, with an additional 85,000 people in Minnesota and Iowa, within about 1 1/2 hours driving time from the watershed. All areas of the watershed are within easy access to the city of La Crosse. Lake Onalaska receives the heaviest use of the lakes and streams in the watershed. U.S. Fish and Wildlife Service personnel estimate that there are about 450,000 to 500,000 visits annually to Pool 7 of the Mississippi River, of which Lake Onalaska comprises over half and is considered to have the best fishing sites. About 150,000 of those visits are by anglers. A DNR Fish Management survey conducted in 1969 indicated that almost 3/4 of the fishermen utilizing Pool 7 are from Wisconsin, with almost 1/3 being from La Crosse County. Most of these Wisconsin anglers live within 25 miles of the lake.

Of the other recreational uses of this area of the Upper Mississippi Wildlife and Fish Refuge, about 250,000 or half of the visits annually are for "nonconsumptive, non-wildlife" use such as waterskiing, picnicing, canoeing, etc., followed in number of users by "nonconsumptive wildlife" use such as bird watching, nature observation and hiking.

These same types of activities occur in the Van Loon Public Hunting Grounds, with about 2,500 participant days of waterfowl and small game hunting, 2,000 participant days of fishing, hiking, nature observation, and cross country skiing, and 100 participant days of primitive canoe camping each year.

Though there have been no recent creel census conducted along the trout streams in the watershed to estimate the number of trout fishermen using the streams, DNR Fish Managers feel the resource is well utilized and there is sufficient pressure to warrant the current stocking level.

2. Potential Use - An increase in use of Lake Onalaska following implementation of nonpoint source controls in the watershed is not likely to be immediately apparent because of the current heavy use of the lake. However, the life of the lake as a recreational resource will be prolonged, perhaps substantially.

The DNR Fish Managers are optomistic that correction of the nonpoint source problems in the watershed could lead to as much as a 5-fold increase in the

number of fishermen utilizing the trout streams in the watershed. With a combination of nonpoint source controls and trout habitat improvement, the increase in the use could be as much as 10-fold.

The continued ability of the Black River, Van Loon Public Hunting Grounds and Upper Mississippi River Wildlife and Fish Refuge to support current recreational use levels is dependant on abating the nonpoint source of sediment and other pollutants to the rivers before the effects become irreversible.

WATER QUALITY OBJECTIVES

The water quality objectives for the watershed project identify the desired water quality improvements that can be achieved by installing the nonpoint source controls recommended by this plan.

Excess sediment is the major cause of water quality problems in the streams of the Lower Black River Watershed as well as in Lake Onalaska. The GREAT 1 Study of the Upper Mississippi River Basin indicates that the Lower Black River Watershed falls within the area identified as having severe erosion hazard and the potential to contribute significantly to the sediment problems in the Mississippi River (see Figure 8). Once sediment reaches the intermittant coulees in the Lower Black River Watershed it is flushed downstream during the more intense storms.

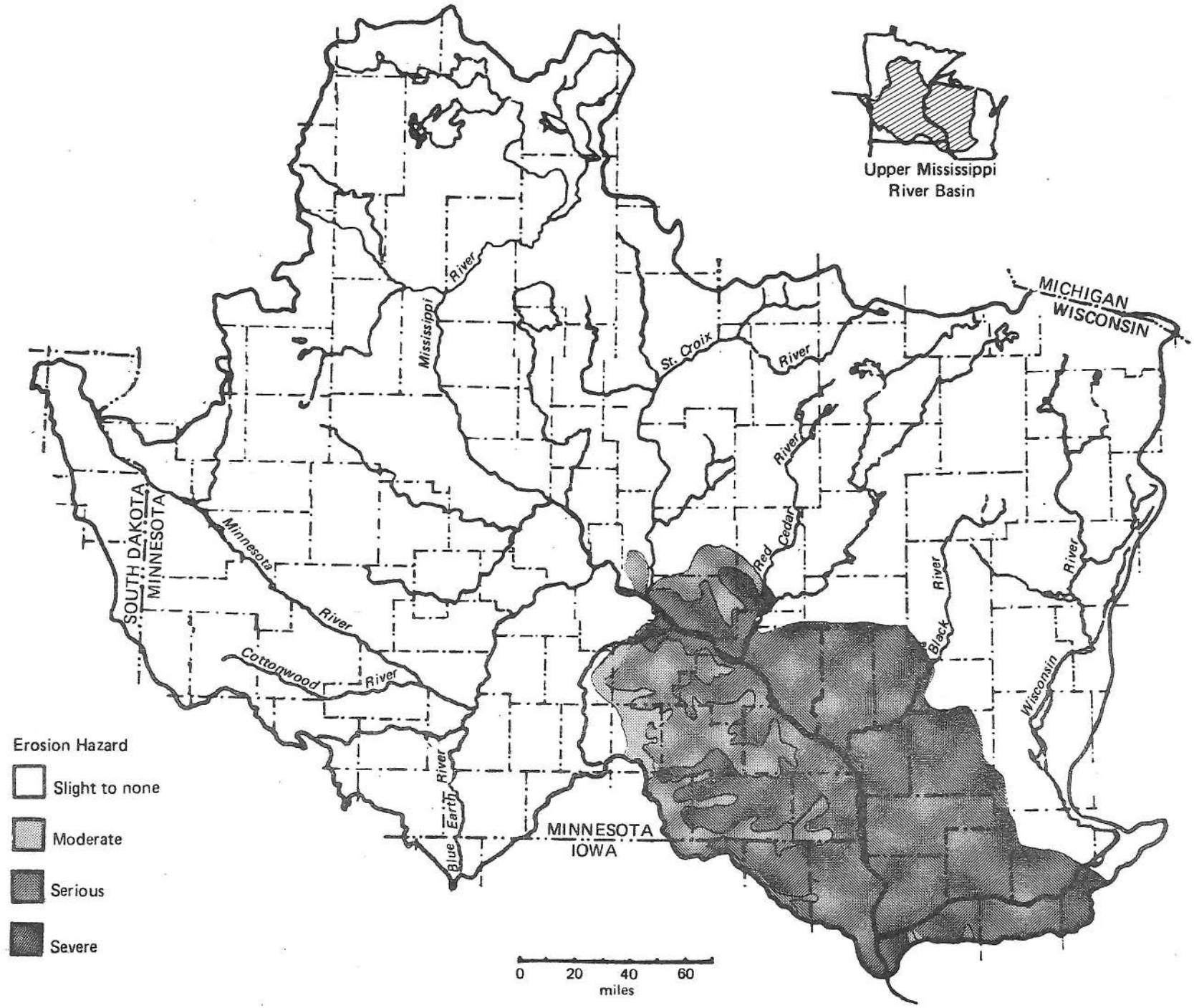
Smallmouth bass feeding, growth and reproduction in the Black River is limited by excess sediment. The natural reproduction of trout in Halfway Creek, Creamery Creek and the other Class III trout streams in the watershed is limited by lack of habitat due to excess organic material, sediment and loss of cover. Lake Onalaska is loosing open water area, densities of aquatic plants are increasing and has the potential to loose a well balanced largemouth bass and bluegill fishery due to excess sediment and attached nutrient loading to the lake.

Due to the specific water quality problems in the Lower Black River Watershed and the nature of the nonpoint source pollutants, it is difficult to define specific objectives that are reasonable and economically feasible while producing improvements in water quality that are quantifiable. It is important to make incremental steps towards the improvement of water quality in the Mississippi River by contributing to reductions in sediment loading to the river. Asthetic improvements in the lakes and streams are also important, though difficult to quantify. In addition to these general sediment reduction and asthetic improvement goals, the appropriate water quality objectives that are applicable to the streams and lakes within the Lower Black River Watershed are:

1. Improve the existing trout fishery in Halfway Creek, Jostad Creek and Hardies, Creamery Creek by reducing the sediment and organic loads to the creeks and improving the fish habitat and streambank cover.

2. Protect the smallmouth bass habitat of the Black River within the watershed by reducing the sediment and organic material from Fleming Creek and its tributaries and from Grant Creek.

Figure 8: Critical Source Areas of Sediment in the Upper Mississippi River Basin (from GREAT 1, 1980)



3. Contribute to the preservation of the existing warmwater fishery and recreational value of Lake Onalaska while making incremental reductions in the sediment load to the Mississippi River by reducing the sediment load from Fleming Creek, Grant Creek, Black River, Halfway Creek and Sand Lake Creek.

The long term measure of the achievement of the objectives for the project should be the improvement in the fishery of the watershed lakes and streams. This includes an improvement in the trout fishery in Halfway Creek, Creamery Creek and Jostad and the continuation of a good smallmouth bass fishery in the Black River and largemouth bass and bluegill fishery in Lake Onalaska. Improvements in stream habitat will provide an interim measure of progress towards the objectives. This will be measured through DNR's Stream Evaluation Method which will give an indication of improved fish carrying capacity.

SOURCES OF POLLUTANTS

As discussed in the preface, both nonpoint sources and point sources of pollutants have the potential to adversely impact water quality. The most effective approach to improving water quality in the Lower Black River Watershed is a comprehensive approach addressing all potential pollution sources to the watershed's lakes and streams. First, the significance of each of the sources relative to the total problem must be determined. Therefore, a thorough inventory of the watershed was conducted by the La Crosse County Department of Land Conservation (DLC) with assistance from the Trempealeau County Department of Land Conservation (DLC), U.S. Soil Conservation Service (SCS), University of Wisconsin-Extension (UWEX), and the Department of Natural Resources (DNR). The methods and results of the inventory, which was conducted in the summer and fall of 1982, are discussed below.

Nonpoint Sources - Poor management of different land uses causes nonpoint source pollution. Generally, the severity of the nonpoint source impacts on water quality increases as the intensity of the land use and extent of land disturbance increases and proper land management decreases. Landuses surveyed in the Lower Black River Watershed include cropland, woodland, pasture and urban areas along with barnyards and streambanks.

1. Streambank Erosion - Approximately 50% of the total stream miles in the watershed were surveyed using a modification of phase II of the Land Inventory Monitoring (LIM) process commonly used by SCS to estimate streambank and gully erosion. This process ranks streambank erosion according to four categories: none, slight, moderate and severe. The ranking is based on three parameters: the length, the height and the estimated lateral recession of each area of eroding streambank. Slight bank erosion is defined as occurring when the bank is bare, but lateral recession is not obvious. Moderate bank erosion is identified by actively eroding banks with many exposed roots, fallen vegetation and cave-ins. Severe bank erosion is generally associated with meanders and is characterized by massive washouts and slumps.

   The LIM process can also be used to estimate the tons of soil coming from eroding streambanks by assigning an estimated average weight per cubic foot of soil loss.

In the Lower Black River Watershed, every other mile of Fleming Creek and Halfway Creek and the majority of the tributaries was walked. LIM information as well as information on cattle access was collected. For analysis purposes, it was assumed that 100% of the soil eroding from the streambanks reaches the streams.

The results of the survey, summarized by watershed, are shown in Table 3 which follows.

The survey results also indicated that cattle access to streambanks is common throughout the watershed.

The information indicates that about 7% of the sampled streambanks are moderately or severely eroding. As extrapolated from the sampling information the estimated lengths of each of the streams with moderate and severe streambank erosion problems are given in Table 4.

Table 4: Estimated Lengths of Streambanks that are Eroding Moderately and Severely

Subwatershed Stream	Feet Eroding
Upper Fleming	
Fleming Cr.	7,600
Cr. 22-1	-
Cr. 22-12	-
Cr. 22-7	60
Heller	-
Bell	-
Wet	-
Creamery	2,880
Subtotal	10,540
Lower Fleming	
Fleming Cr.	10,440
Gavin	2,420
Roberts	-
Cr. 14-3	2,220
Sour	2,480
Cr. 9-3	-
Ponstad Berg	1,060
Subtotal	18,620
Grant-Decorah	
Grant Cr.	2,000
Subtotal	2,000
Halfway	
Halfway Cr.	11,940
Cr. 1-11	-
Jostad	240
Spring Coulee	640
Johnson	2,940
Subtotal	15,760
Long	
Long Cr.	4,540
Moe Cr.	-
Casberg	60
Subtotal	4,600
Sand Lake	
Sand L. Cr.	9,800
Subtotal	9,800
Total	61,320

While only a small percentage of the streambanks are actually eroding, streambank erosion along the watershed's streams, excluding the Black River, is contributing an estimated 6,820 tons of sediment to the streams. Along the Black River the banks are also contributing large amounts of sediment to the river, but the vast majority of the eroding banks are naturally occurring and are realistically uncontrollable. It should be noted that of the eroding streambanks only a small percent of the streambank lengths are eroding at a severe rate, yet they contribute a

Table 3: Results of the Streambank Erosion Survey by Subwatershed in Moderate and Severe Erosion Categories

	Subwatershed															
	Upper Fleming		Lower Fleming		Grant Decorah		Halfway Creek		Long Coulee		Sand Lake		Caledonia		Overall Total	
	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.	Mod.	Sev.
% streambank that is eroding	3.5	.5	8	1	5	0	7	.5	6	0	16	0	0	0	6.5	.5
Tons of soil loss	915	135	1,865	875	760	-	615	965	400	-	290*	-	-	-	4,845	1975
% of subwatershed streambank soil loss in each category	87	13	68	18	100	-	39	61	100	-	100	-	-	-	82	18

*Approximately 360 tons of soil are eroding along Sand Lake Creek, but because of the intermittent nature of the stream, only about 80% or 290 tons are actually reaching Lake Onalaska.

significant percentage of the total streambank sediment load, especially along the mainstem of Fleming Creek, Creek 14-3 and Creek 3-11. Therefore, concentrating streambank erosion control efforts on the smaller, critical areas could reduce the streambank sediment load substantially.

2. Barnyard Runoff - There are a total of 199 animal operations in the Lower Black River Watershed. Almost all of the farmsteads are located in the valleys of perennial or intermittent streams. Many of the barnyards are located directly adjacent to the stream, or have steep slopes between the barnyard and the stream. The close proximity of the barnyards to the streams increases the potential for pollutants from the manure to reach the stream. These pollutants include organic matter which depletes dissolved oxygen in the water and ammonia which can be toxic to fish at certain concentrations.

   Information on all of the barnyards in the watershed was collected for use in a mathematical model which estimates the phosphorus and chemical oxygen demand load from each barnyard to the stream. Chemical oxygen demand, COD, is a measure of how much of the stream's dissolved oxygen is used up during decomposition of the organic material from the barnyards. The barnyard runoff model, An Evaluation System to Rate Feedlot Pollution Potential (Young, 1982), is used by the Minnesota Pollution Control Agency to evaluate the potential pollution problems from animal feedlots. Information on number and types of animals, size of areas draining through the barnyards, distance of the barnyard to the stream and vegetative cover on the buffer area as well as existing management practices and an estimate of how significant of a water quality problem the barnyards are preceived to be was collected by LCD personnel. The number of barnyards perceived to be critical by LCD personnel along with the number of barnyards estimated to be contributing 75% of the COD load for each subwatershed are given in Table 5.

Table 5: Results of the Barnyard Inventory

Subwatershed	High[1]	Medium[2]	Low[3]	Total Number	Number of Barnyards[4] Contributing 75% of the COD Load
Upper Fleming	22	11	14	47	12
Lower Fleming	23	9	12	44	13
Grant/Decorah	13	9	--	23	9
Halfway Creek	19	11	8	38	10
Long Coulee	12	1	12	23	5
Sand Lake	4	1	1	6	6
Amsterdam/Brice	1	0	14	15	--
Caledonia	0	3	0	3	--
Watershed Total	94	45	61	199	55

1 High rated barnyards are generally those within 1/8 mile (660 feet) of a continuously flowing stream. In the Lower Black River Watershed, consideration was also given to barnyards located near intermittent streams or with ditches or waterways leading to perennial streams.

2 Medium rated barnyards are generally those within 1/4 mile (1320 feet) of a continuously flowing stream or 1/2 mile (2640 feet) from an intermittent stream, dry run or ditch leading to perennial stream.

3 Low rated barnyards are generally those beyond 1/4 mile (1320 feet) of a continuously flowing stream which do not have obvious transport of barnyard runoff to either an intermittent or continuously flowing stream.

4 Based on Barnyard Runoff Model analysis.

Dairy farming is the predominate livestock enterprise in the watershed, with 40 milk cows being the most common number of animals, except larger herds are more common in the Lower Fleming and Grant-Decorah subwatersheds. A few beef operations are present, especially in the Long Coulee and Upper Fleming Creek subwatersheds, along with several hog and horse operations and a few sheep operations. Small hobby type farms with 20 or less animals occur in Sand Lake and Long Coulee subwatersheds.

The results of the model generally agree with the LCD observations. A small number of critical barnyards contribute a significant percent of the

pollutant load. The model indicated that the 94 barnyards ranked high in the barnyard inventory contribute about 93% of the total COD and 94% of the total phosphorus load from barnyards to the watershed's streams. In the Lower Black River Watershed, COD is a more accurate indication of the potential water quality problems than phosphorus because of the impacts the organic material has on fish habitat. Seventy-five percent of the estimated COD load is attributed to 55 of the barnyards. Of these critical barnyards, 16 are located directly adjacent to a perennial or intermittent stream, with an additional 42 barnyards located within 100 feet of a stream.

The model was also run to simulate the reduction in the pollutant load which would result from the installation of adequate manure management practices in the barnyards. Clean water diversions around barnyards alone could reduce the estimated COD load by as much as 71% and diversions plus good vegetative cover on existing buffer areas between the barnyards and streams could reduce the COD load by as much as 74%.

Correcting the runoff problems on a small number of the most critical barnyards can make significant progress towards achieving water quality improvements. Both LCD personnel perceptions and barnyard runoff model results should be considered when deciding which barnyards are the most critical.

3. Erosion on Croplands, Woodlands and Pasture - Information was collected by subwatershed on the number of acres in each of these landuse categories. In addition, data needed to calculate average tons/acre/year (T/A/Y) of soil loss plus total tons of soil loss using the Universal Soil Loss Equation (USLE) was collected for each of the landuse categories. The USLE factors include slope, slope length and cropping practices and rotations, along with average rainfall and soil erodability information. In the La Crosse County areas of the Lower Black River Watershed, LCD personnel randomly selected farms comprising approximately 20% of the watershed area (ranging from 15-21% of each of the subwatersheds). All of the acres on the sampled farms were inventoried. The percent of landuse, slope and cropping information from the sampled farms was extrapolated to the entire subwatershed. Because the sample units were based on farm boundaries, the survey results may be slightly biased to give somewhat high cropland acre values and low urban and woodland acre values.

   In the Trempealeau County areas of the watershed, the percent landuse and slope information was obtained from a comprehensive county landuse survey. The survey was developed by the county LCD personnel based on a computer model which utilizes soil survey and USLE information and was developed by Dr. Norman Bliss at the University of Wisconsin River Falls. Cropping rotations in each slope category for the Grant-Decorah and Caledonia subwatersheds in Trempealeau County were extrapolated from information from the Lower Fleming and Amsterdam Brice subwatersheds, respectively, in La Crosse County which have similar slope and cropping patterns.

   The number of acres and percent of the subwatershed in each of the landuse categories is shown in Table 6.

Table 6: Number of Acres and Percent of Area In Each Landuse Category by Subwatershed

Subwatershed	Upper Fleming		Lower Fleming		Grant Decorah		Halfway Creek		Long Coulee		Sand Lake		Amsterdam Brice		Van Loon		Caledonia		Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	0
Total Ac.	18,560	100	16,640	100	8,320	100	16,640	100	6,400	100	7,040	100	13,440	100	8,960	100	10,680	100	106,680	100
Cropland	6,350	34	7,910	48	3,500	42	6,120	37	2,110	33	1,100	16	9,050	67	--	--	7,080	66	43,220	41
Woodland	9,660	52	6,410	38	4,250	51	6,740	40	3,160	49	3,530	49	2,040	15	8,960*	100	2,420	23	47,170	44
Pasture/ Grassland	2,480	13	2,320	14	380	5	2,460	15	1,100	17	670	10	1,280	10	--	--	720	7	11,410	11
Urban	70	1			190	2	1,320	8	30	1	1,740	25	1,070	8	--	--	460	4	4,880	4

*Because such a large percent of the Van Loon subwatershed is in public ownership, it was assumed to be adequately managed and therefore not inventoried. It is primarily in wetland and woodland cover.

Table 7: Total Tons and Average Tons Per Acre Per Year (t/a/y) of Soil Loss In Each Land Use Category by Subwatershed

Subwatershed	Upper Fleming		Lower Fleming		Grant Decorah		Halfway Creek		Long Coulee		Sand Lake		Amsterdam Brice		Van Loon		Caledonia		Total
	Tons	t/a/y	Tons	t/a/y	Tons	t/a/y	Tons	t/a/y	Tons	t/a/y	Tons*	t/a/y	Tons	t/a/y	Tons	t/a/y	Tons	t/a/y	Tons
Cropland	44,770	7	35,240	4	21,240	6	32,390	5	11,620	6	4,470	6	33,020	4	--	--	31,130	4	213,880
Woodland	5,580	<1	3,230	<1	1,060	<1	2,940	<1	1,490	<1	1,660	<1	630	<1	--	--	60	<1	16,650
Pasture/ Grassland	5,808	2	5,170	2	1,130	3	7,150	3	1,660	1	930	1	540	<1	--	--	170	<1	21,830

*Total tons of soil loss for Sand Lake Subwatershed is based only on those areas draining to the stream and does not include soil loss on internally drained areas.

Forty-one percent of the watershed is in cropland use, 44% is in woodland use, 11% is in pasture and grassland use and 4% is urban. The Amsterdam Brice and Caledonia subwatersheds have higher percentages of cropland, and Van Loon, Upper Fleming, Grant-Decorah and Long Coulee subwatersheds have higher percentages of woodland. Most of the urban areas occur in the Sand Lake and Halfway Creek subwatersheds.

Based on USLE calculations, the total tons of soil loss as well as the estimated average ton/acre/year of soil loss for each landuse category and subwatershed are shown in Table 7. Cropland erosion accounts for the highest tons of soil loss in all subwatersheds.

All the soil loss occurring on the upland croplands, woodlands and grasslands does not get carried to the streams. In the Lower Black River Watershed, the percent of total soil loss that is estimated to be reaching the streams was determined for each subwatershed by a method published in a paper by Sam Manor entitled "Factors Affecting Sediment Delivery Rates in the Red Hills Physiographic Area". The method is based on the relief:length ratio of a given watershed area. The ratio consists of the change in elevation from the upstream most area of the watershed to the lowest, mouth area over the length of that same distance. The steeper the topography, the higher the percent of the soil loss which will reach the stream. The delivery ratios for the different subwatersheds are given in Table 8. The ratios range from 10% in the flatter Caledonia Area to 55% and 48% in the steeper Sand Lake and Long Coulee areas, respectively. These ratios are consistent with those found in similar topographical areas of northern Illinois where sediment delivered to an impoundment was monitored over a number of years.

Another consideration when determining sediment delivery to streams is the exclusion of land areas with internal drainage which do not contribute water (or sediment) to surface water flow. In the Lower Black River Watershed, the Sand Lake subwatershed is the only subwatershed with significant areas of internal drainage. About one third of the subwatershed area is internally drained and therefore does not contribute sediment to Sand Lake Creek or Lake Onalaska. In addition, Sand Lake Creek is often intermittent below its junction with Highway 53-35. Therefore it was assumed for purposes of this analysis that only about 80% of the sediment load carried by the stream is carried to Lake Onalaska.

Table 8 shows the calculated tons of soil estimated to be reaching the streams and Lake Onalaska. Cropland, comprising about 41% of the watershed area, contributes 77% of the estimated overall watershed sediment load. Woodland acres, pasture and grassland acres, and streambanks contribute the remaining 23% about equally, at a little more than 7% each. The delivery ratios for Caledonia, Van Loon and Amsterdam-Brice subwatersheds are relatively low. Therefore, the sediment delivered from these subwatersheds is not significant when compared to other areas of the watershed because the estimated tons/acre/year erosion rate for delivered cropland soil loss is so low (see Table 9). Critical areas of erosion within the landuse categories are briefly described below.

a. Croplands - Referring to Table 8, the highest sediment load delivered from croplands occurs in the Upper Fleming subwatershed, followed by the Halfway Creek and Lower Fleming subwatershed. In all the subwatersheds, less than one half of the cropland acres are eroding at a rate greater than 5 tons per acre per year, but those acres contribute over 70% of the cropland sediment load (see Table 10). The very small numbers of acres which are eroding at greater than 20 tons/acre/year contribute a significant amount of the cropland sediment. Acres eroding at greater than 20 tons/acre/year contribute 54% of the cropland sediment in the Sand Lake and 30% in the Upper Fleming subwatershed. Table 9 also shows how much of the calculated tons of soil loss for all of the landuses in the subwatersheds comes from croplands eroding at greater than 5 tons/acre/year. In the Upper Fleming, Grant-Decorah, Halfway Creek and Long Coulee subwatersheds one half or greater of the estimated subwatershed soil loss is occurring on croplands eroding at greater than 5 tons/acre/year.

   The common cropping practices and rotations vary within the subwatersheds, but the highest soil loss rates are occurring on croplands on steep slopes of over D, E or F slopes * where corn is grown continuously or where rotations have a high number of years of row crops. This problem is particularly significant west of Mindoro.

   As a general indication of which subwatersheds have the highest potential for cropland soil loss to reach the streams, the estimated cropland erosion rates for sediment <u>delivered</u> to streams is given in Table 8.

b. Woodlands - The Upper Fleming, Halfway Creek and Lower Fleming Creek subwatersheds contribute the highest woodland sediment load as shown in Table 8. In all the subwatersheds, grazed woodlands on E and F slopes contribute the most significant percent of the woodland sediment. Grazed woodlands on E and F slopes range from 5% of the Grant-Decorah woodlands to 29% of the Upper Fleming, Lower Fleming and Sand Lake woodlands and contribute from 26% of the woodland sediment load in Halfway Creek to 65% in Lower Fleming. The values are shown in Table 11. The problem appears to be the most critical in the Sand Lake subwatershed where grazed woodlands on E and F slopes are estimated to contribute over 12% of the total subwatershed sediment load.

c. Pasture and Grasslands - Soil erosion and delivery on pasture and grasslands appears to contribute the most significant number of tons to the streams in Halfway Creek and Upper Fleming Creek subwatersheds. Within this category, cattle pasturing on E and F slopes contributes the highest soil loss, especially in Halfway Creek and Sand Lake Creek where pastured E and F slopes contribute 11% and 10%, respectively, of the total subwatershed sediment load. The percent acres and soil loss information is summarized in Table 12.

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* Slope Categories are defined as:

A = 0-2% slope	C = 6-12% slope	E = 20-30% slope
B = 2-6% slope	D = 12-20% slope	F = greater than 30% slope

Table 8: Total Tons of Sediment Delivered to Streams and Percent of Delivered Sediment Load From Each Landuse Category by Subwatershed

Subwatershed	Upper Fleming		Lower Fleming		Grant Decorah		Halfway Creek		Long Coulee		Sand Lake		Amsterdam Brice		Van Loon		Caledonia		Total	
Delivery Ratio To Streams	45%		35%		40%		42%		48%		55%		25%		15%		10%			
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons*	%	Tons	%	Tons	%	Tons**	%
Total	26,000	100	18,010	100	10,130	100	19,420	100	7,500	100	3,400	100	8,560	100	--	-	3,140	100	96,160	100
Cropland	20,150	78	12,330	69	8,500	84	13,600	71	5,580	74	1,970	58	8,260	96	--	-	3,110	99	73,500	77
Woodland	2,510	10	1,130	6	420	4	1,240	6	720	10	730	21	160	2	--	-	10	-	6,920	7
Pasture/ Grassland	2,290	8	1,810	10	450	4	3,000	15	800	11	410	12	140	2	--	-	20	1	8,920	9
Streambanks	1,050	4	2,740	15	760	8	1,580	8	400	5	290	9	--	-	--	-	--	-	6,820	7

*Total tons of soil loss delivered from Sand Lake Subwatershed is based only on contributing acres, times 80% delivered to Lake Onalaska, due to the intermittent nature of the stream during certain times of the year.

**Total tons of soil loss delivered from the watershed does not include streambank erosion along the Black River because it was determined to be almost entirely natural and realistically uncontrollable under the Priority Watershed Program Objectives.

Table 9: Average Tons Per Acre Per Year (t/a/y) of Delivered Cropland Soil Loss by Subwatershed

Subwatershed	Upper Fleming	Lower Fleming	Grant Decorah	Halfway Creek	Long Coulee	Sand Lake	Amsterdam Brice	Van Loon	Caledonia
t/a/y delivered	3	2	2	2	3	3	1	--	<1

TABLE 10: Cropland Soil Loss in Greater Than 5 T/A/Y Rage Category

Subwatershed	Upper Fleming	Lower Fleming	Grant Decorah	Halfway Creek	Long Coulee	Sand Lake
Estimated no. of acres of Cropland eroding at 5 T/A/Y or greater	2,980 ac	2,370 ac	1,440 ac	2,200 ac	740 ac	250 ac
% cropland eroding at 5 T/A/Y or greater	47%	30%	41%	36%	35%	23%
% cropland soil loss coming from croplands eroding at 5 T/A/Y or greater	82%	64%	72%	72%	70%	70%
% of total subwatershed soil loss from croplands eroding 5 T/A/Y or greater	63%	43%	60%	50%	52%	40%

TABLE 11: Woodland Soil Loss on Grazed E and F Slopes

Subwatershed	Upper Fleming	Lower Fleming	Grant Decorah	Halfway Creek	Long Coulee	Sand Lake
Estimated no.of acres of grazed woodlands on E and F slopes	2,700 ac	1,860 ac	210 ac	670 ac	30 ac	1,020 ac
% of woodland in grazed E & F slopes	28%	29%	5%	10%	1%	29%
% of total woodland soil loss from grazed E and F slopes	56%	65%	29%	26%	2%	57%
% of total sub-watershed soil loss from grazed woodlands on E and F slopes	6%	4%	1%	2%	1%	12%

Table 12: Pasture and Grassland Soil Loss on E and F Slopes

Subwatershed	Upper Fleming	Lower Fleming	Grant Decorah	Halfway Creek	Long Coulee	Sand Lake
Estimated no. of acres of pasture (grazed) on E and F slopes	790 ac	900 ac	70 ac	138 ac	130 ac	270 ac
% of pasture and grass land acres in grazed E & F slopes	32%	39%	19%	56%	12%	40%
% of pasture and grass land soil loss from grazed E & F slopes	78%	77%	56%	72%	47%	82%
No. of total subwatershed soil loss from grazed E & F slopes	7%	8%	2%	11%	5%	10%

4. Urban Areas - In the La Crosse County areas of the Lower Black River Watershed, the number of acres in urban landuse was estimated from the SCS Urban Inventory of La Crosse County conducted by SCS personnel in August 1982. In Trempealeau County, the urban area was estimated from the county soil survey - USLE model information. As shown in Table 5, about 4% of the watershed is in urban landuse, with most of the area occurring in the Halfway Creek and Sand Lake subwatersheds. These subwatersheds include the City of Holmen, the Village of Midway, and areas of the City of Onalaska, in addition to unincorporated urbanizing areas north of Onalaska.

   Increased stormwater runoff volume and velocity and erosion on bare construction sites are nonpoint source problems associated with urban and urbanizing areas. In the Lower Black River Watershed, current urban nonpoint source problems appear to be minor. A survey of the watershed urban areas conducted in the summer of 1982 by UWEX personnel indicated very little construction occurring at that time. The largest open construction area is the Holmen Industrial Park which is about 45 acres in size. At the time of the survey, there were also a number of small construction areas in the north part of Onalaska, east of CTH S and south of Holmen in the Timberline Addition subdivision. These areas do not appear to be causing significant water quality impacts. However, as the economy improves and construction increases and urban development continues to expand, particularly north of Onalaska and throughout the Sand Lake subwatershed, the problem could become more severe. Within the watershed a portion of the city of Onalaska and all of the village of Holmen are served by stormsewers. The stormsewer for the area of Onalaska within the watershed discharge to ponds adjacent to the railroad tracks which eventually drain to Lake Onalaska. For Holmen the stormsewers discharge to infiltration ponds or to Halfway Creek. Urban stormwater runoff carries pollutants more directly to receiving water resources with less filtering than is inherent in well managed rural land. As urban areas within the watershed expand and larger impervious areas are served by stormsewers, the potential for runoff to adversely impact Halfway Creek and Lake Onalaska will increase unless the stormwater is properly managed. Street sweeping helps reduce the sediment, nutrients and other pollutants carried by the stormwater runoff. Currently, neither Holmen of Onalaska have regular routine street sweeping programs. Erosion on single home sites and inadequate management of stormwater runoff are the nonpoint source problems most likely to become significant as development takes place in the Sand Lake subwatershed.

Point Sources - There are three industrial and two municipal wastewater treatment plant discharges to streams in the Lower Black River Watershed. All of these point source discharges are meeting permit limits and do not appear to be having significant impacts on the water quality in the receiving streams.

According to water quality monitoring in 1978, the Mindoro Wastewater Treatment Plant effluent is not having an adverse effect on the dissolved oxygen or suspended solids concentrations in Fleming Creek, but effluent ammonia concentrations can become slightly elevated and add to existing ammonia levels in the stream. The Holmen Wastewater Treatment Plant has

recently completed upgrading which should alleviate conditions of high fecal contamination, organics, nutrient, and ammonia loads to Halfway that occurred in the past.

CONCLUSIONS

In the Lower Black River Watershed, the major water quality concerns are excess sedimentation, organic material from barnyards and cattle access to the watershed's streams. Reductions in these three categories of nonpoint source pollution are necessary to meet the identified water quality objectives.

The primary source of sediment to the streams is excess cropland erosion which contributes an estimated 77% of the total sediment load delivered to the streams from the watershed. A large percent of the cropland erosion comes from a small percent of the cropland acres which have high rates of tons per acre per year of soil loss. The acres with high erosion rates vary with each subwatershed, but are generally areas of steep slopes, D, E, or F slopes, where corn is grown continuously or where rotations have a high number of years of row crops and are not grown on the contour. Erosion on woodlands, pastures, and streambanks each contribute about equally to the remaining 23% of the watershed sediment load to streams. There are large numbers of acres of woodland and pasture with low erosion rates. However, a small percent of the acres, those on steep slopes where cattle are grazed on both woodlands and grasslands, cause a very large percent of the woodland and pasture sediment load.

Most of the streambank erosion occurs along relatively short stretches of the streambanks where erosion rates are high. While 100% of the sediment eroded from streambanks is delivered to streams, the problem is usually very visible and can appear to be contributing a larger percent of the total sediment load than is actually occurring. Some of the eroding streambanks are aggravated by mans activities and some are naturally occurring. Most of the naturally occurring streambank erosion in the Lower Black River Watershed is not cost-effective, and therefore unrealistic, to control. Cattle access to streams, which can aggravate streambank erosion and reduce fish habitat, is common throughout the watershed. Additional water temperature and fish cover problems occur where cattle have access to springs.

One hundred and one of the barnyards in the watershed can be considered high potential sources of organic material and suspended sediments to the streams. The impacts are most critical where fish habitat is a concern. Generally, barnyards located nearest to the streams, without adequate buffer areas between the barnyard and stream, have the greatest potential to cause adverse water quality impacts. This is especially true of barnyards located in upper reaches of streams, where the streams have low assimilative capacities because of low flow.

The details of the nonpoint source problems in each subwatershed are summarized below, with the problems listed in order of importance:

1. Upper Fleming Creek Subwatershed: Croplands with erosion rates of 5 T/A/Y or greater contribute an estimated 63% of the subwatershed sediment load

to Fleming Creek and its tributaries. These croplands with high erosion rates primarily occur on D and E slopes, where crops are grown up and down slopes, and corn is grown continuously, and contour strips are not used with rotations. Twenty-two of the barnyards appear to be high priority concerns, especially along Creamery Creek and along the small tributaries near the headwaters of Fleming Creek. About 4% (10,500 feet) of the streambanks in the subwatershed are eroding moderately and severely, mainly along Fleming Creek and Creamery Creek and are contributing an estimated 4% of the total subwatershed sediment load. Grazed woodlands on E and F slopes contribute an estimated 6% of the subwatershed soil loss. And erosion from pasturing cattle on steep E and F slopes appears to be contributing 7% of the subwatershed sediment load to streams.

2. Lower Fleming Creek Subwatershed: Croplands eroding at 5 T/A/Y or greater are contributing an estimated 43% of the sediment load to the lower end of Fleming Creek, to be carried directly to the Black River. Acres of continuous corn grown up and down on C through F slopes appear to be the primary concern. Twenty-three of the barnyards appear to be contributing significant organic material loads to the tributaries and to Fleming Creek. Approximately 9% (2,000 feet) of the streambanks are eroding moderately or severely, including much of Fleming Creek, Gavin Creek, Roberts Creek, Creek 14-3 and Sour Creek. These eroding areas contribute about 15% of the subwatershed sediment load. Cattle pasturing of grasslands on E and F slopes contributes an estimated 8% of the subwatershed sediment load. An additional 4% of the subwatershed sediment load comes from the grazed woodlands on E and F slopes.

3. Grant-Decorah Prairie Subwatershed: Erosion on croplands over 5 T/A/Y contributes 60% of the overall subwatershed sediment. These areas include most croplands on D and E slopes as well as acres in continuous corn on B or greater slopes. Thirteen of the barnyards appear to be high priority. About 5% (2,000 feet) of the Grant Creek streambanks are eroding moderately, but contributes an estimated 8% of the total subwatershed sediment load. Grazed woodlands and pasture on steep slopes do not appear to be contributing significant percentages of the sediment load to the streams in this subwatershed.

4. Halfway Creek Subwatershed: Because of the trout fishery objective, barnyards are the most critical nonpoint source concern in this subwatershed. Both moderate and high potential barnyards need improved management. This includes 30 barnyards. Cropland acres on D and E slopes and continuous corn on C, D, and E slopes, even using chisel plowing, comprise a large percent of the cropland acres eroding at greater than 5 T/A/Y, which contribute about 50% of the overall subwatershed sediment load. About 7.5% (almost 16,000 feet) of the streambanks are moderately and severely eroding, mostly along Halfway and Johnson Creeks, and contribute about 8% of the overall sediment load, which is deposited directly in the streams on potential fish habitat. Cattle access to streambanks and springs aggravates the streambank erosion problems. Pasture on E and F slopes is estimated to be contributing about 11% of the overall subwatershed sediment load.

5. Long Coulee Subwatershed: Thirteen of the subwatershed barnyards are considered high and medium priority and contribute to the reduction in fish habitat in Long Coulee Creek with the potential to impact Halfway Creek as well. Cropland acres eroding at 5 T/A/Y or more, primarily continuous corn grown on B, C, D, and E slopes, even using chisel and no-till plowing, contribute an estimated 52% of the sediment load. About 6% (4,600 feet) of the Long Creek streambanks are eroding moderately and contribute about 5% of the subwatershed sediment load. Pasturing E and F slopes contributes approximately 5% of the sediment load.

6. Sand Lake Subwatershed: Croplands with 5 T/A/Y or greater erosion rates contribute 40% of the subwatershed sediment to Lake Onalaska. These lands include continuous corn grown on C, D, and E slopes as well as crops grown on E slopes using chisel plowing. About 16% (9,800 feet) of the Sand Lake Creek streambanks are eroding moderately and contribute about 9% of the subwatershed sediment load. Grazed woodlands on E and F slopes 12% of the sediment load from the subwatershed; grazed woodlands on E and F slopes contribute 12% of the sediment load; and pasturing on E and F slopes contributes about 10% of the subwatershed sediment load. Potential concerns exist with excess construction site erosion and inadequate management of increased stormwater runoff as larger areas of the subwatershed become urbanized.

Table 13 summarizes the most critical nonpoint source contributions for each subwatershed.

Table 13: Summary of the Most Critical Nonpoint Sources Identified by the Lower Black River Watershed Inventory.

Subwatershed	Cropland eroding at 5t/a/y		Grazed woodlands on E & F slopes		Pasture on E & F slopes		Streambanks eroding moderately & severely		Critical barnyards
	acres	% of tons*	acres	% of tons	acres	% of tons	feet	% of tons	
Upper Fleming	2,980	63	2,700	6	790	7	10,540	4	22
Lower Fleming	2,370	43	1,860	4	900	8	18,620	15	23
Grant-Decorah	1,440	60	210	1	70	3	2,000	8	13
Halfway Creek	2,200	50	670	2	140	11	15,760	8	30
Long Coulee	740	52	30	1	130	5	4,600	5	13
Sand Lake	250	40	1,020	12	270	10	9,800	9	4

* "% of tons" represents the % of the total subwatershed tons of soil loss which are estimated to be delivered to the streams from the given source. The rows do not total 100% of the subwatershed sediment loss because some percent of the subwatershed sediment load is due to erosion on landuse /slope categories not included in this table.

PRIORITY MANAGEMENT AREA

The priority management area (PMA) of the watershed is that part of the land area where pollutant laden runoff has the greatest potential to reach streams and channels, and where application of best management practices will be the most effective at improving water quality. In general, the areas with high soil losses and high delivery rates are the most critical because they contribute to high sediment loads to the streams.

In the Lower Black River Watershed, because of the steep topography and high sediment delivery rates, and the fact that most of the land area falls within a quarter mile of a perennial or intermittent stream, all of the Upper Fleming, Lower Fleming, Grant-Decorah, Halfway Creek, Long Coulee and Sand Lake subwatersheds are considered critical areas of potential nonpoint source loadings to surface waters and therefore comprise the Priority Management Area. The PMA is shown in Figure 9.

Within these subwatersheds, the most significant sources need to be controlled and it is in those areas where efforts will be concentrated to implement best management practices to correct the problems. In some areas of these subwatersheds, a less intense level of pollutant reduction is necessary to achieve good water quality conditions. An example of this is the barnyards located near, but not directly adjacent to the mainstem of Fleming Creek, because they will not significantly impact existing fisheries. However, the same farm may need upland erosion control practices.

In the Amsterdam-Brice Prairie and Caledonia subwatersheds, water quality objectives are currently being met, even though erosion rates may be high, because of the low delivery rates of the sediment to the streams. The majority of the Van Loon subwatershed is currently under an existing fish and wildlife management plan and is adequately treated. Most of the streambank erosion that is occurring within the Van Loon subwatershed is natural. Therefore, these subwatersheds are not currently considered critical with regards to nonpoint source pollutants and no additional management is recommended through the watershed project. Therefore these subwatersheds are not included in the PMA.

Only landowners in the PMA are eligible for cost-sharing assistance to install best management practices under the Wisconsin Fund Nonpoint Source Program. In areas where critical erosion problems are occurring, but are not considered a source of water quality problems, existing cost-share programs, such as ACP, should be adequate.

RECOMMENDATIONS

Considering the identified water quality problems and nonpoint sources of pollution in the Lower Black River Watershed, the following actions are recommended in order to achieve the desired water quality objectives within the watershed. The recommendations are made in order of importance for each subwatershed.

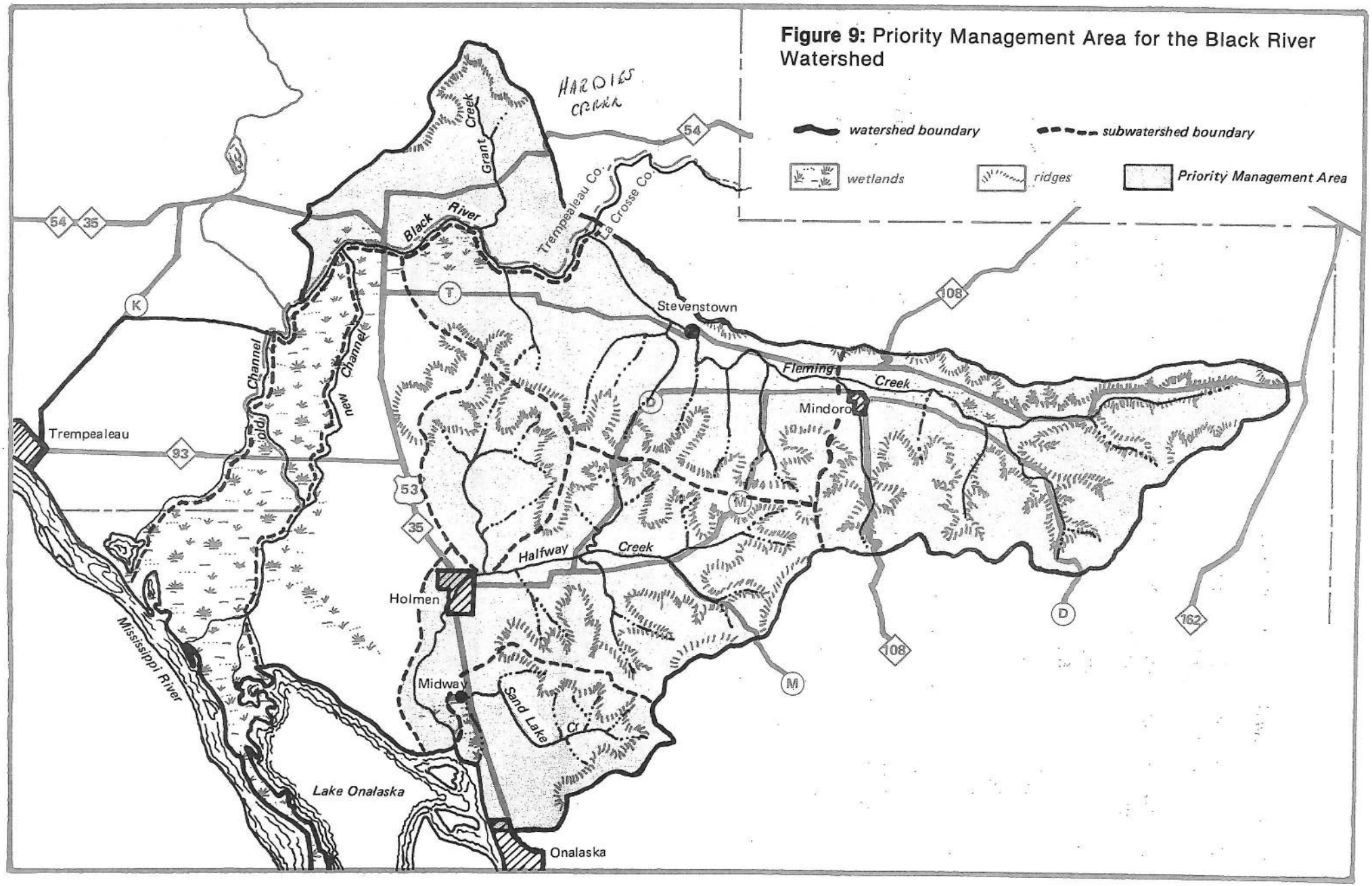
Figure 9: Priority Management Area for the Black River Watershed
watershed boundary
subwatershed boundary
wetlands
ridges
Priority Management Area
HARDIES CREEK
Grant Creek
Black River
Trempealeau Co.
La Crosse Co.
54
35
K
T
Stevenstown
108
Fleming Creek
Mindoro
Old Channel
New Channel
Trempealeau
93
53
35
D
M
Halfway Creek
Holmen
Mississippi River
Midway
Sand Lake Cr
Lake Onalaska
Onalaska
162

For Upper Fleming Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 2,980 acres need improved management.

2. Reduce the organic load from the 22 most critical barnyards ranked high in the barnyard inventory.

3. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totally about 10,540 feet,
   - reducing erosion from grazed woodlands on steep slopes; about 2,700 acres,
   - reducing erosion from steep pasture areas; about 790 acres.

For Lower Fleming Creek Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 2,370 acres need improved management.

2. Reduce the organic load from the 23 most critical barnyards ranked high in the barnyard inventory.

3. Reduce streambank erosion on moderately and severely eroding sites totalling about 8,620 feet.

4. Address equally:
   - reducing erosion from steep pasture areas; about 900 acres,
   - reducing erosion from grazed woodlands on steep slopes; about 1,860 acres.

For Grant-Decorah Prairie Subwatershed:

1. Reduce cropland soil loss to no more than 5 T/A/Y; about 1,440 acres need improved management.

2. Reduce the organic load from the 13 most critical barnyards ranked high in the barnyard inventory.

3. Reduce streambank erosion from moderately and severely eroding sites totalling about 2,000 feet.

NOTE: Reducing the cropland soil loss to no more than 5 T/A/Y would reduce the estimated sediment load for these three subwatersheds by as much as 40%. Critical erosion areas on C, D, and E slopes, especially where corn is grown continuously, should be addressed. Practices such as increasing the number of years of hay in existing rotations and contour strips are needed.

Fifty-eight of the barnyards are considered the most critical, with those situation right on the small tributaries having the greatest potential to impact water quality. Efforts should be concentrated along Creamery Creek

where the organic material from the barnyards can affect trout fishery habitat. Because there is not a fishery objective in other tributaries in these subwatersheds, judgement can be used as to what level of barnyard runoff control is needed to meet water quality objectives, and barnyard work may be optional on cost-share agreements for some of the barnyards in these areas. Cleanwater diversions and improved vegetative cover on existing buffer areas are useful practices.

Fencing of cattle out of springs in headwater areas of the tributaries could make considerable water quality improvements at little cost.

In the Grant-Decorah Prairie subwatershed, grazed woodlands and pasture on steep (E and F) slopes do not appear to contribute significant sediment loads for the subwatershed as a whole. However, for these three subwatersheds together, proper pasture management and removing cattle from steep slopes could reduce the pasture/grassland sediment loss by as much as 42% and fencing cattle from woodlands on E and F slopes could reduce the woodland soil loss by 35%.

For Halfway Creek Subwatershed:

1a. Reduce the organic load from the 30 barnyards ranked high and medium priority in the barnyard inventory.

1b. Reduce cropland erosion to no more than 5 T/A/Y; about 2,200 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 15,670 feet,
   - reducing erosion on pasture on steep slopes; about 140 acres,

3. Co-ordinate implementation with trout stamp and trout habitat work.

For Long Coulee Subwatershed:

1a. Reduce the organic load from the 13 barnyards ranked high and medium in the barnyard inventory.

1b. Reduce cropland soil loss to no more than 5 T/A/Y; about 740 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling about 4,600 feet,
   - reducing erosion on steep pasture areas; about 130 acres.

NOTE: In these two subwatersheds, both barnyard runoff controls and fencing of cattle away from streambanks are of primary importance to the trout fishery objective for Halfway Creek. A significant reduction of the organic material load to the streams from the 43 high and moderate priority barnyards is needed. Again, cleanwater diversions and buffer areas are important.

Increased years of hay in rotations, contour strips and minimum tillage should be applied to the steep cropland areas, where a reduction of soil loss to no more than 5 T/A/Y could reduce the cropland soil loss on these two subwatersheds by 38%.

Not pasturing cattle on E and F slopes could significantly reduce the sediment load from pasture and grasslands by over 50%. Better management of steep slopes should be encouraged.

For Sand Lake Subwatershed:

1. Reduce cropland erosion to no more than 5 T/A/Y; about 250 acres need improved management.

2. Address equally:
   - reducing streambank erosion on moderately and severely eroding sites totalling 9,800 feet,
   - reducing erosion from grazed woodlands on steep slopes; about 1,020 acres,
   - reduce erosion from steep pasture areas; about 270 acres.

3. Encourage the city of Onalaska to develop a construction erosion and runoff control ordinance which will include single home sites.

   NOTE: Reducing the cropland erosion to no more than 5 T/A/Y in Sand Lake Subwatershed would produce a 42% reduction in the cropland sediment load. Using more hay in rotations, cropping on the contour and minimum tillage for continuous corn are applicable practices.

   About equal consideration should be given to streambank and grazed woodland erosion control. Fencing cattle from woodlands on E and F slopes could reduce the woodland soil loss by 38% and not pasturing E and F slope grasslands could reduce the pasture/grassland soil loss by as much as 60%.

   This subwatershed has increasing urban development pressure and the potential to be increasingly impacted by construction erosion in the future. The county of La Crosse has a construction site erosion control ordinance, but it is not applicable in incorporated areas. The Town of Onalaska ordinance does not cover individual lots. To avoid problems in the future, towns where construction site erosion is a problem should work with the LCD when developing erosion control plans. The City of Onalaska should be encouraged to work with the LCD when developing stormwater management plans.

In all the subwatersheds, the most significant nonpoint sources need to be addressed to assure that the water quality objectives should be met. Implementation of best management practices to control these problems will be included on the cost-share agreement with the landowner. The nonpoint sources of secondary importance do not require the same intensity of effort, and while they should be considered when developing the cost-share agreement, judgement can be used as to how critical the problem is and what the most cost effective solution is.

MANAGEMENT NEEDS

Best Management Practices (BMP) are defined as practices, techniques or measures identified in the Black River Basin Comprehensive Water Quality Management Plan to be the most effective, practical means of preventing or reducing pollutants generated from nonpoint sources.

The Best Management Practices needed in the Lower Black River Watershed are listed below. Although many practices would also be appropriate, only those anticipated to meet most typical situations in the watershed are included in this list. See Appendix A of this plan for a complete list of BMPs cost-sharable under the Nonpoint Source Program.

1. Contour Strip Cropping - Growing crops on the contour in alternated strips of close growing crops, clean tilled row crops and grass legumes.

2. Diversions - A structure installed to divert water from areas where it is in excess to sites where it can be used or transported safely.

3. Conservation (minimum) Tillage - Tillage practices which disturb and roughen the entire soil surface but not to the extent of mold board tillage systems. Some vegetative residue must remain on the surface. Technical assistance will be available for this practice, but it will not be cost-shareable under the Lower Black River Watershed Project.

4. Waterway - A natural or constructed water course shaped, graded and established in suitable cover as needed to prevent erosion by runoff waters.

5. Grade Stabilization Structure - A structure used to stabilize the grade in a channel or to prevent the formation or advance of gullies.

6. Critical Area Stabilization - Planting suitable protective vegetation on highly erodable areas, such as gullies, roadsides, construction activities on public lands.

7. Barnyard Runoff Management/Manure Storage Facility - A planned system to manage liquid and solid waste, including runoff from concentrated waste areas, in a manner which prevents or minimizes degradation of air, soil and water resources and protects public health and safety.

8. Streambank Protection - Stabilizing and protecting banks of streams and lakes against erosion. Includes riprapping, fencing, shaping and seeding, livestock and machinery crossing and buffer strips. Considering the kind of livestock and the water quality goals, single-strand electric fencing will be cost-sharable. Fencing of livestock from the streambank along areas of riprap is required for rip rap to be eligible for cost-sharing.

9. Livestock Exclusion from Woodlots - Protection of woodlots, especially those on steep slopes, from livestock grazing by fencing or other means.

EXTENT OF BEST MANAGEMENT PRACTICES AND ESTIMATED COST

Based on the needs identified in this plan, Table 14 lists the estimated Best Management Practice needs and extent, the unit cost, the total cost and the state cost-share. For 100% landowner co-operation, the estimated state cost-share amounts to $1,602,000.00. Because 100% participation is not very likely due to the voluntary nature of the Wisconsin Nonpoint Source Water Pollution Abatement Program, a participation level of 75% has been used to more accurately estimate budget needs. At 75% participation, the estimated state cost-share amounts to $1,201,600.00.

Table 14: Extent of BMPs and Estimated Cost

Best Management Practice	Units Needed	Cost/Unit ($)	Total Cost ($)	Maximum State Cost Share (%)	Total Cost Share ($)
Cropland					
Contour Strip Cropping	3,500 acres	$ 16.00/ac	$ 56,000	50%	$ 28,000
Diversions	38,500 feet	2.25/ft	86,625	70%	60,638
Conservation Tillage	6,400 acres	--	--	50%	--
Waterways	156 acres (187,200 feet)	2.00/ft	374,400	70%	262,080
Critical Area Stabilization	30 acres	$ 450.00/ac	$ 13,500	70%	$ 9,450
Grade Stabilization	82 units	7500.00/ea	615,000	70%	430,500
SUBTOTAL			$1,145,525		$790,668
Animal Wastes					
Barnyard Runoff Management	105 units	$ 7500.00/ea	$ 787,500	70%	$ 551,250
Manure Storage	11 units	8570.00/ea	94,270	70%/$6,000 maximum	66,000
SUBTOTAL			$ 881,770		$617,250
Streambank Protection					
Fencing	171,600 feet	.24/ft.	$ 41,184	70%	$ 28,829
Riprap, including grading & seeding	7,680 feet	$18.50/ft	142,080	70%	99,456
Livestock Crossings	39 units	$575.00/ea	22,425	70%	15,698
SUBTOTAL			$ 205,689		$143,983
Woodland					
Fencing	6,554 acres (80 rods/60 acres)	$ 12.00/rd	$ 104,864	50%	$ 52,432
SUBTOTAL			$ 104,864		$ 52,432
TOTAL			$2,337,848		$1,602,083
			(with 75% participation)		$1,201,562

PROJECT EVALUATION

The success of the Lower Black River Watershed Project will depend on the number of critical landowners who choose to participate in the project, as well as the short and long term changes in water quality. Evaluating the success of the project will include consideration of both the landowner participation rate as well as calculated decreases in nonpoint source pollution due to changes in land management and measured changes in water quality.

The following detailed evaluation procedure is a more comprehensive approach to evaluating the success of priority watershed projects than has been included in the watershed plans in the past. Currently, the Department is in the process of reviewing the components of this evaluation approach. Necessary modifications identified as part of the review should be applied to the activities presented as part of this evaluation procedure before they are implemented.

The following activities will be used to evaluate the achievements of the Lower Black River Watershed Project:

A. Landowner Participation - Maps showing acres under cost-share agreement and units of practices planned and installed, along with tables summarizing total practices installed will be reviewed quarterly and compared with projected goals. The maps should indicate that landowner contacts and practices are directed purposefully into subwatersheds and critical areas according to the implementation schedule identified in the Implementation Strategy.

B. Water Quality Improvements - Quantifiable biological and physical water quality information will be collected at the beginning of implementation of the watershed project and again after all practices have been installed. The measurable improvements in water quality will also be reflected in improvements in more subjective parameters such as improved asthetic value and increased use and awareness of water resources. The methods for measuring these asthetic and awareness parameters are beyond the scope of the Priority Watershed Project. However, indirect measurement of these parameters, as indicated by the number of landowner sign-ups, will be considered at the time of the evaluation.

1. Base level water quality information will be collected by the Department during the second year of the project, starting in fall 1984. The water quality surveys will include:

a) The use of the DNR Stream Classification Guidelines to evaluate the stream habitat at a total of 10 - 15 sites along the upper end of Fleming Creek, the lower end of Long Coulee, and along Creamery Creek, Halfway Creek, Severson Coulee and Jostad Creek. The purpose of the Stream Classification is to evaluate the biological potential of a stream. To be used as a nonpoint source evaluation tool, the Stream Classification Guidelines should be conducted twice at each sampling location at this time: once to measure existing conditions taking into nonpoint sources and a second time to estimate the biological potential if the nonpoint sources were removed.

Hardies

b) Fish sampling to determine the types and numbers of each species present at 10 - 15 sites along Fleming Creek, Long Coulee, Creamery Creek, Halfway Creek, Severson Creek and Jostad Creek, which will be co-ordinated with the Stream Classification sites.

c) Collecting Biotic Index samples at 5 - 10 sites along Fleming Creek, Long Coulee, Creamery Creek, Halfway Creek, Severson Creek, and Jostad Creek which will also be co-ordinated with the Stream Classification and fish sampling locations. If the Biotic Index sites sampled by the Department in 1980 co-ordinate with the Stream Classification and fish sites, they should be used. Two replicate samples should be collected at each site during the same day.

It is important that the sampling locations be chosen to reflect the identified priority areas of the watershed, where the water quality improvements are most likely to be seen and where landowner participation is most likely to occur. The sampling sites for all three parameters should be co-ordinated and the sampling should occur during the same season. This will require Department Fish Managers and District Biologists to jointly develop a sampling program based on a preliminary study design determined after a watershed visit. The number and lengths of sample sites will depend primarily on those needed by the Fish Managers to characterize the stream because the fish sampling sites require the greatest length.

2. Improvements in water quality in the watershed due to the implementation of this plan will be measured during the seventh and eight years of the project after most of the Best Management Practices are installed. This will include:

a) Repeating the Stream Classification evaluation at the same locations as the base level survey, evaluating conditions as they exist at that time and comparing the results with the previous biological potential information to determine the changes that have occurred.

b) Repeating the fish surveys at the same locations as the base level survey.

c) Repeating the Biotic Index sampling at the same locations as the base level survey.

C. Reductions in calculated Soil Loss - As an interim measure, at the end of the landowner sign-up period during the fourth year of the project, reductions in soil loss will be estimated by:

1. Conducting an evaluation of the streambank erosion using the LIM process at areas where streambank protection practices have been installed along the Lower Fleming Creek, Grant Creek, and Sand Lake Creek similar to the way the original watershed inventory was conducted.

2. Estimating the reduction in cropland, pasture and woodland soil loss using information from the cost-share agreements where practices have been installed along with the USLE. Analysis should be conducted similar to the way the inventory analysis was done to allow for comparison of results.

At the end of the 8 year project period, after all practices have been installed, the LIM inventory and soil loss analysis will be repeated.

The final evaluation of how successful the Lower Black River Watershed Project has been at meeting its objectives will consider the results of all the above measurements. Adequate water quality sampling and analysis time will be identified for the Fish Manager and District Biologist through the Department's work planning process. During the second year of the project, Fiscal Year 1984-85, approximately 40 hours of stream classification and Biotic Index sampling, 40 hours of fish sampling and 200 - 250 hours of sample identification time have been identified as needed.

PART II: IMPLEMENTATION STRATEGY

INTRODUCTION

The purpose of the Implementation Plan is to serve as a guide for the efficient implementation of the Lower Black River Watershed project needs which were identified in the Management Plan.

This Implementation Plan identifies:

1. the tasks necessary to implement the recommendations in the Management Plan;

2. the agencies and units of government responsible for carrying out those tasks;

3. the time frame for completion of those tasks; and

4. the type and amount of staff needed.

The general procedure used for achieving the water quality objectives identified in the Management Plan is through the voluntary installation of corrective land management practices to control the critical nonpoint sources. Cost-share funds are provided to contract with landowners to cover a percentage of the costs of and installing the practices. In addition, funds are made available to the implementing agencies to cover the accelerated work effort required to carry out their responsibilities.

AGENCIES INVOLVED

Designated Management Agencies

Designated management Agencies (DMAs) are those local units of government identified in the areawide water quality plans as having responsibility for soil and water conservation, including implementation of best management practices to improve water quality. For unincorporated areas, the La Crosse and Trempealeau County Boards will serve jointly as DMAs, being represented by their respective Land Conservation Committees. The City of Onalaska and the Village of Holmen are the identified DMAs for nonpoint source responsibilities within their respective incorporated limits. Together these units of government are able to provide project cost-share funding to landowners, install practices on public lands, and develop regulatory processes as needed to protect waters if voluntary programs prove unsuccessful.

The La Crosse County Land Conservation Committee, acting for the La Crosse County Board, was selected as the Lead Designated Management Agency (LDMA) for the Lower Black River Watershed Project by the other DMAs involved. The LDMA is responsible for coordinating activities among all other DMAs in the watershed. The LDMA is also contractually and financially responsible to the State of Wisconsin for overall management of the project, and responsible for coordinating activities of all the agencies involved.

These DMAs have been named by the DNR to manage the nonpoint source water pollution abatement project for the Lower Black River Watershed. The responsibilities for the DMAs, which are defined in the Wisconsin Administrative Rules, NR 120.06, are summarized below:

1. Assist with the development and approval of the priority watershed plan;

2. Recommend revisions to the plan to allow for necessary changes as the project is implemented;

3. Carry out education and information programs about nonpoint source pollution and land management needs;

4. Administer the cost-sharing element of the project including sign-ups, approval, authorization of payments, and record keeping;

5. Certify installation, operation, and maintenance of best management practices;

6. Coordinate and control cost-sharing monies with local contributions;

7. Report to DNR on project progress and recommended project modifications;

8. Screen applications for variances to established cost-sharing rates; and

9. Determine priority for assistance among grant applications.

All of these activities may be carried out by the DMAs or by delegation to other agencies of units of government.

Cooperating Agencies

In addition to the designated management agencies, the Lower Black River Watershed Project will receive assistance from the other agencies listed below.

1. Soil Conservation Service (SCS) (U.S.D.A.) - This agency works through the local Land Conservation Committee for La Crosse and Trempealeau Counties. The SCS provides technical assistance for installing conservation practices. The La Crosse and Trempealeau County SCS personnel will work with other project personnel to provide inventories of conservation needs, estimated costs of best management practices, planning, designing, layout, supervision, and certification of practice installations.

2. University of Wisconsin Extension - County Extension agents will provide expertise in planning, coordinating and conducting public information, education, and participation efforts. UW-Extension will also assist the DMAs in the development of watershed tours, workshops, and newsletters.

3. Agricultural Stabilization and Conservation Services (ASCS) - Under contract to the La Crosse County Land Conservation Committee, the La Crosse County ASCS office of the U.S.D.A. will provide assistance for fiscal management of the Lower Black River Watershed project. In

addition, cost-sharing provided by the ongoing ACP program (Agricultural Conservation Program) will be coordinated with the Wisconsin Fund project in the Lower Black River Watershed.

4. Department of Natural Resources - The Department has overall administrative responsibility for the Wisconsin Nonpoint Source Water Pollution Abatement Program of which the Lower Black River Priority Watershed is part. The DNR is responsible for allocation of funds to the project, for water quality surveys and for evaluation of the watershed plan and project.

IMPLEMENTATION APPROACH

Best Management Practices

Those land management practices which will effectively control the water pollutants from nonpoint sources are called best management practices (BMPs). The practices eligible for the Lower Black River Watershed project for cost-sharing under the Wisconsin Fund program are listed in Table 15. The cost-sharing rates which were determined by the LCC range from 50% to 70% and fall within the maximum state cost-share rates established for the Nonpoint Source Program in Administrative Rule NR 120.

TABLE 15: BMPs and Maximum Cost-Share Rates

Practice	Maximum Project Cost-Sharing Rate
Contour Strip Cropping	50%*** ($8.00/acre)
Diversions	70%*
Waterways	70%*
Critical Area Stabilization	70%
Grade Stabilization Structure	70%
Shoreline Protection	70%
Settling Basins	70%
Barnyard Runoff Management	70%
Manure Storage Facilities	70%**
Livestock Exclusions from Woodlots	50% ($6.00/rod)
Street Cleaning	50%
Special Streambank Protection	70%

* 60% Cost-Share Rate if the practive is installed during the period from August 1 to September 15 each year.
** Up to $6,000 per facility.
*** A flat rate per acre equal to the cost-share rate applied to an average installation may be used.

The BMPs included in Table 15 are those practices which will help meet the water quality objectives set for the watershed. The specifications used for these practices must meet the Soil Conservation Service requirements concerning technical design. It is possible some practices may be recommended

that are not included on the BMP list. Administrative Rule NR 120.10(4)(b) and (c) provides for substitute practices under conditions which are set on a case by case basis.

Appendix A describes the practices and cost-share procedure in further detail.

Cost-Sharing for Best Management Practices

Cost-share funding is available to landowners for a percentage of the costs of installing the best management practices on their land that are necessary to meet the watershed project objectives. Landowners have three years to sign up for cost-share dollars after the formal approval of the watershed plan and Grant Agreement development. The cost-share agreement is a legal contract between the landowner and the appropriate DMA, either the La Crosse County or Trempealeau County Land Conservation Department. The cost-share agreement (see Appendix C for example) includes the number and types of practices that are needed, the estimated installation dates, estimated practive costs, cost-share percentage rate, and estimated cost-share reimbursement amount. The agreements also include practices which are needed to meet water quality objectives but are not cost-sharable under the Nonpoint Source Program. Once the agreement is signed, the landowner has five years to install the practices.

The following general policies apply to the cost-share eligibility under the Wisconsin Fund Program:

1. Only BMPs installed at specific locations necessary to improve or protect water quality are eligible.

2. Rural and urban areas are eligible.

3. Cost-sharing is limited to areas of the state with approved areawide water quality management plans.

4. Cost-sharing is limited to priority management areas of priority watersheds.

Cost-sharing is not available for practices which:

1. are normally and routinely used in growing crops;

2. are normally and customarily used in cleaning of streets and roads (increased street cleaning is eligible if it benefits water quality);

3. have drainage of land as the primary objective;

4. installation costs can reasonably be passed on to potential consumers.

It is possible some practices may be "custom" designed and do not fit the established definition for a particular practice. The Nonpoint Source Program will provide for substitute management practices after review and approval by the DNR, who will make a final determination on eligibility for cost-sharing and assign a maximum cost-sharing rate. Design specifications will be recommended by the SCS Technical Guide Work Group.

Implementation Schedule

Landowners have three years to sign up for the Priority Watershed cost-share funds once the Lower Black River Watershed plan has been approved and Wisconsin Fund cost-share dollars have been appropriated to the project. Each landowner in the Priority Management Area (Upper and Lower Fleming Creek, Grant-Decorah, Halfway Creek, Long Creek, and Sand Lake Subwatersheds) will be contacted with watershed information by project personnel during the first year of the project with emphasis on those landowners showing the most interest. In addition, to assure that project implementation will occur in the most critical areas of the watershed first, efforts to contact landowners should be concentrated according to the subwatershed schedule recommended below.

1. During the first year, landowner sign-up efforts and technical assistance will be concentrated in the Halfway Creek, Long Coulee, and Grant-Decorah subwatersheds.

2. During the second year, landowner sign-up efforts and technical assistance will be concentrated in the Upper and Lower Fleming Subwatersheds.

3. During the third, landowner sign-up efforts contracting and technical assistance will be concentrated in the Sand Lake Subwatershed, but will include the entire watershed. Emphasis will be placed on recontacting those landowners who showed some interest in the past but have not yet made a commitment. Certain activities which encourage landowners to participate in the program, such as small group meetings, will occur throughout the watershed during all three years.

INFORMATION AND EDUCATION PROGRAM

The objective of the information and education program is to create an awareness and understanding of the Lower Black River Watershed Program, and to generate interest and support among landowners. It is also the intent of this program to develop and distribute sufficient information to allow the landowner to evaluate and make intelligent decisions regarding his/her involvement and participation in this cost-sharing program.

An effective information/education program is important to the success of the priority watershed project. It is essential for the program to be comprehensive and closely coordinated with other ongoing activities in the project. While the information/education program is necessarily a "team effort", the overall responsibility for implementing and coordinating the information/education program will be provided by the University of Wisconsin-Extension Service in La Crosse County. Assistance will also be provided when necessary and appropriate by the other agencies involved in the project, primarily the County Land Conservation Committees and SCS. Information/education activities will be conducted throughout the implementation phase of the Lower Black River Watershed Project. The majority of the activities will occur during the early stages of the project and will gradually taper off through later stages of project implementation as the cost-share sign-up period ends.

During the initial years of the project, information/education efforts will be directed to all landowners in the watershed area. This effort will be general in nature and designed to acquaint the landowners with the basic features and concepts of the program and the watershed.

The information will explain the concept of priority management area to the residents living in the watershed and the idea that only those landowners in the PMA will be eligible for cost-sharing assistance through the Nonpoint Source Program. Later activities will be designed to familiarize landowners with the details of the specific practices available.

Table 16 summarizes the educational activities, along with their audience and the co-ordinating agency, for the duration of the project. The out-of-pocket expenses for these activities are estimated to be $15,700 and will require an estimated 1,000 hours of staff time over the eight year project life. Each year estimates of the staff needs and costs for the scheduled educational activities will be developed as part of the Local Assistance Agreement.

Certain activities are briefly described below, with descriptions of the remaining activities in Appendix B.

Newsletters will be used to educate and inform farmers and landowners on many parts of the project including: discussions on best management practices; announcements and reviews of meetings, tours and demonstrations. The newsletters will be developed and distributed throughout the duration of the watershed on a quarterly basis.

Information Packets containing information such as the purpose of the watershed project, the agencies involved, a map of the watershed and priority management areas, schedule of cost-share rates, practice fact sheets and other information as determined to be necessary will be developed. The packet will be given to landowners through personal contacts and also distributed at meetings. They can also be used to file new watershed information as it becomes available.

The Woodland Management Field Days are proposed for the first and third year of the project to demonstrate the key management practices available, emphasizing the runoff reduction, water quality improvements and economic benefits of proper woodland management in harvesting, eliminating cattle from woodlots and road construction.

Soil Management Classes will be conducted throughout the watershed to teach farmers the importance of proper soil management for water quality protection and help the farmers develop individual farm plans for their farm.

Installer/Contractor Workshops are designed to inform contractors about proper installation of land management practices on farmsteads as well as erosion control techniques for construction sites. Emphasis will be on learning correct land measurement techniques to insure accurate installation of practices.

TABLE 16: Educational Activities Scheduled for the Lower Black River Watershed Project

Activity	Audience	Co-ordinating Agency	Number/Project Year 1	2	3	4	5	6	7	8	Total
Newsletters	Landowners + Officials	UWEX	4	4	4	2	2	2	2	2	22
Information Packets (500)	Potential Co-operators	LCD/UWEX	1								1
BMP "Sales Booklets" (6)	Potential Co-operators	LCD/UWEX	1								1
Small Group Meetings	Rural Landowners	LCD	9	9	9						27
Small Group Meetings	Civic Groups	UWEX	5	5	5	2	2	2	2	2	25
Letters of Interest	All Landowners	LCD	1								1
Subwatershed Visit Announcement Letters	Rural Landowners	LCD	2	2	2						6
Elk Cr. Watershed Tour (Fall)	Interested Landowners	LCD/UWEX	1								1
County Board Tour	Officials	UWEX	1							1	2
Woodland Field Day (Fall)	Interested Landowners	UWEX/DNR		1	1						2
Barnyard Runoff Management Wkshp. (Spring)	Rural Landowners	UWEX		1							1
Barnyard Runoff Management Demonstration Site	Rural Landowners	LCD		1							1
Tillage Tour	Rural Landowners	UWEX	1		1						2
Installer/Contractor Workshops	Practice Contractors	LCD/UWEX	1	1	1	1	1				5
Soil Management Classes	Rural Landowners	LCD	1	1	1						3
Urban Workshops	Urban & Suburban Landowners	UWEX		1		1		1			3
Youth/Sports Club Habitat Improvement Day	Youth & Sports Clubs	UWEX		1	1	1					3

BMP "Sales Booklets" are three-ring binder notebooks containing information about available Best Management Practices including color photos and written information on the merits and "How-to" of the practices. The notebooks will be developed for field staff to use to explain the practices to landowners during individual contracts or at meetings.

Urban Workshops are directed towards urban, suburban and rural landowners to acquaint them with proper soil and water management techniques for homesites.

ADMINISTRATIVE AND TECHNICAL ASSISTANCE NEEDS

The program management and technical needs for carrying out the watershed project have been developed by the La Crosse County LCC with the assistance of Trempealeau County LCC and SCS. A large number of the program management activities involve fiscal management. The Lead DMA will handle most of the project management activities and within the Lead DMA, a project manager has been identified.

Lead DMA Responsibilities

The Lead DMA, La Crosse County Land Conservation Department, will be responsible for the day-to-day operations of the project and coordination with the other DMAs and governmental agencies, groups, organizations and educational institutions. The Lead DMA will maintain complete project records at the La Crosse County LCD office. These records should include: correspondence, contracts and subcontracts, financial transactions, memoranda of understanding, project status and evaluation reports landowner contacts and landowner cost-share agreements. A system of recording landowner contacts and project progress, including a map of areas under cost-share agreement, will be developed. The map should be of sufficient detail to identify upland, barnyard and streambank practices needed and installed. The watershed project landowner files will be kept separate from LCC cooperator files and grouped alphabetically by subwatersheds. For landowners who have signed cost-share agreements, the files need to include: the agreement with any amendments, conservation plan, practice design information, practice certification, progress reports, bills, proofs of payment and other records of financial transactions.

The Trempealeau County Department of Land Conservation will maintain project files for the landowners in the Trempealeau County area of the watershed. However, copies of the cost-share agreements, practice certification and progress reports will be mailed to the La Crosse County LCD office. The Lead DMA will be accountable to the Department of Natural Resources for maintaining complete records.

Project Manager Responsibilities

The Project Manager is identified to serve as a liaison between the state and federal agencies involved in the program and the DMAs. The La Crosse County Conservationist will act as the project manager and will be accountable to the DMAs. The major responsibilities of the project manager include monitoring contracts between DMAs and other agencies, organizations and individuals throughout project implementation, managing finances, supervising project

staff and coordinating technical assistance with information and educational activities. Specifically, the project manager will need to keep track of landowner cost-share encumbrances and Wisconsin Fund grant balances, as well as process the local assistance reimbursement, including Trempealeau County activities, quarterly through the DNR.

Administrative Procedure

Under project management, the majority of the activities involve handling the different steps of cost-share agreement development and reimbursement. The routine administrative procedure developed by the Lead DMA to handle each of the specific steps and coordinate activities between Trempealeau and La Crosse County is given in Table 17.

Briefly, once the landowner has signed a cost-share agreement, the LCC in Trempealeau or La Crosse County will be responsible for approving the Lower Black River Watershed cost-share agreements with landowners within their county. A complete file of all the landowners in the watershed with cost-share agreements will be kept at the Lead DMA office. Each County will additionally be responsible for the design, layout, installation and certification of BMPs in their respective counties.

The landowner will be responsible for contacting the contractor and getting two bids for barnyard work, grade stabilization structures and riprapping projects. Once the practice is completed, both the technician and the landowner certify that it is completed, with the technician having the responsibility to make sure the installation meets proper standards and specifications.

The Nonpoint Source Program is designed to reimburse the landowner after the practice has been installed, certified by the technician and the landowner has paid the contractor. In the Lower Black River Watershed, the landowner must also certify that the practice has been completed and then pay the contractor the determined percent of the total cost that is the landowner's share. Then a check will be issued in the name of both the landowner and the contractor simultaneously to cover the state share of the total cost. There will be one watershed checking account and landowners in both counties will be reimbursed through the La Crosse County ASCS office.

Reimbursement of the watershed project by DNR for payment of landowners will occur as needed. Initially an "up front" amount of funding will be made available to the project to establish the watershed checking account. As landowners are reimbursed for completed practices and the balance is drawn down, the Project Manager will forward the appropriate documents to DNR who will in turn reimburse the project. The necessary documentation includes: a Cost-share Calculation and Practice Certification Form (Form #3200-53) for each landowner being reimbursed and a Request for Advance or Reimbursement Form (Form #3400-70) which indicates total prior pay requests. Examples of these forms are included in Appendix C. The Nonpoint Source Grant Agreement covers the cost-share funds available to the watershed project and will be amended to cover increased encumberances as additional landowners sign cost-share agreements.

TABLE 17: Fiscal Management Route

1. SIGN-UP

   A. Landowner agrees to apply conservation practices, signs cost-share agreement.

   B. Cost-share agreement is developed with landowner by La Crosse or Trempealeau county technicians.

2. APPROVAL

   A. Cost-share agreements are approved at the La Crosse or Trempealeau county LCC meeting and are signed by the appropriate county LCC Chairman.

   B. La Crosse County: Project Manager makes 4 copies of cost-share agreement.

      - One to landowner
      - One to project file (original)
      - One to DNR plus available agreements from Trempealeau County
      - One to ASCS plus available agreements from Trempealeau County
      - DMA keeps copies of Trempealeau's 3200-53 as they are needed

   C. Trempealeau County: Project co-ordinator for Trempealeau County makes 4 copies of cost-share agreement.

      - One copy to landowner
      - One to project file (if needed)
      - Two to La Crosse DMA plus copies of 3200-53s as they are needed

3. FILING COST-SHARE AGREEMENTS

   A. With La Crosse County cost-share agreements, La Crosse ASCS draws up form 3200-53, "Cost-Share Calculation and Practice Certification." Form 3200-53 goes back to Black River Watershed file in DMA office for technicians reference during practice installation. One 3200-53 is made out for each years practice including the practice installation date.

   B. Trempealeau County LCD draws up 3200-53 from original cost-share agreement and sends copies of 3200-53s to DMA with cost-share agreement as in 2(B).

4. PRACTICE INSTALLATION

A. Trempealeau or La Crosse counties will design, layout and supervise installation and certify practices complete within their respective counties.

B. Landowner contacts contractor and technician. Landowner must have two bids for barnyard, grade stabilization and rip rap projects.

C. Practice is installed. Technician completes practice certification on form 3200-53. Technician returns form to ASCS (La Crosse) or LCD (Trempealeau) watershed file.

5. REPORTING INSTALLATION

A. La Crosse County: Landowner reports to ASCS office to turn in project bills and copies of bids (if needed). Landowner certifies project complete on 3200-53. ASCS sends original of 3200-53 to DMA project manager for LCC approval.

Project Manager: Sends signed copies back to ASCS for payment including signed agreements from Trempealeau County. Sends originals of Trempealeau and La Crosse County 3200-53s to DNR, after check number is received from ASCS, attached to reimbursement form.

B. Trempealeau County: Landowner reports to LCD office to turn in project bills and copies of bids (if needed). Landowner certifies project complete on 3200-53. LCC committee approves.

Project Manager: One copy to file (if needed).
One copy and original to La Crosse DMA

6. PAYMENT

A. La Crosse County: When La Crosse County ASCS receives copies of certified 3200-53s, payment is made to landowners in the appropriate county with a letter of notice of evidence of payment and copy of 3200-53 sent to the county LCC office.

TECHNICAL ASSISTANCE

Technical assistance includes: contacting landowners, assessing site needs, developing cost-sharing agreements, designing best management practices, certifying completing of practices, and inspecting operation and maintenance of the practices. SCS will provide the majority of the technical assistance with assistance from the La Crosse County and Trempealeau County LCD in their respective counties. The LCD responsibilities will include landowner contacts and inspecting practice operation and maintenance.

A summary of the critical nonpoint sources needing treatment is given in Table 18.

TABLE 18: Critical Watershed Areas Needing Treatment

Subwatershed	Cropland[1] (acres)	Woodland[2] (acres)	Pasture[3] (acres)	Streambank[4] (feet)	Critical Barnyards[5]
Upper Fleming	2,980	2,704	663	10,000	22
Lower Fleming	2,360	1,851	897	18,000	23
Halfway	2,190	720	1,316	15,000	30
Long	740	28	152	4,000	13
Sand Lake	170	994	260	10,000	4
Grant Decorah	1,410			2,000	13
Total	9,850	6,510	3,360	59,000	105

[1]Based on inventory results indicating acres eroding at greater than 5 T/A/Y.
[2]Based on inventory results, includes acres of grazed woodlands on E and F slopes.
[3]Based on inventory results, includes acres of grassland where cattle are pastured on E and F slopes.
[4]Based on inventory results, shows estimated feet of streambank eroding moderately and severely.
[5]Includes high ranked barnyards in Upper Fleming, Lower Fleming, Grant-Decorah and Sand Lake Watersheds and high and medium ranked barnyards in Halfway Creek and Long Coulee subwatersheds.

The estimated total technical assistance needs can be calculated from acres needing treatment and average amount of time required for each activity, based on county experience. The total hours of technical assistance needed to implement 100% of the project need including landowner contacts, conservation planning, cost-share agreement development, practice design and installation and contract and practice review, are given in Table 19. At 100% participation, there would be approximately 29,000 hours of technical assistance needed to support the project over the eight year project period. However, because of the voluntary nature of the program, 100% participation is not likely. A reasonable estimate of total work hours needed is discussed in the following paragraphs.

TABLE 19: Technical Assistance Hours - 100% of Total Need

Activity	Watershed Total Need		County Total Need*	# hrs/unit	County Total Hours	Watershed Total Hours
Landowner Contract	530	L	480	2 hr/ea	960	1,060
		T	50		100	
Pre-contact Office Inventory	220	L	195	1 hr/ea	195	220
		T	125		25	
Conservation planning on critical acres	19,500	L	18,000 ac	.25 hr/ac	4,500	5,100
		T	1,500 ac		600	
Cost-Share Agreement Development	265	L	240	2 hr/ea	480	530
		T	25		50	
Practice Design and Installation:						
Contour Strips	3,450 ac	L	3,000 ac	.3 hr/ac	900	1,035
		T	450 ac		135	
Diversions	38,500 ft	L	30,000 ft	.02 hr/ft	600	770
		T	8,500 ft		170	
Woodland Fencing	6,554 ac	L	5,600 ac	.1 hr/ac	560	655
		T	954 ac		95	
Waterways	156 ac	L	143 ac	20 hr/ac	2,860	3,120
		T	13 ac		260	
Minimum Tillage	6,400 ac	L	6,000 ac	.2 hr/ac	1,200	1,280
		T	400 ac		80	
Grade Stab. Structures	82	L	62	55 hr/ea	3,410	4,520
		T	20		1,100	
Critical Area Stab.	30 ac	L	10 ac	20 hr/ea	200	600
		T	20 ac		400	
Streambank Fencing	171,600 ft	L	158,400 ft	.001 hr/ft	158	171
		T	13,200 ft		13	
Riprap & Shaping	7,680 ft	L	5,450 ft	.074 hr/ft	403	568
		T	2,230 ft		165	
Livestock Crossing	39	L	35	6 hr/ea	210	234
		T	4		24	
Barnyard Runoff	105	L	92	70 hr/ea	6,440	7,350
		T	13		910	
Manure Storage	11	L	7	60 hr/ea	420	660
		T	4		240	
Subtotal of Practice Design and Installation					17,361	20,953
					3,592	
Annual Contract Review	530		480	1 hr/ea	480	530
			50		50	
BMP Maintenance Check	265		240	2 hr/ea	480	530
			25		50	
TOTAL HOURS		L			24,456	28,923
		T			4,467	

*L = La Crosse County Hours; T = Trempealeau County Hours

TOTAL ESTIMATED WORK EFFORT NEEDED

The total amount of work effort needed to implement the recommendations of the Management Plan include Education, Project Management, Fiscal Management, and Technical Assistance needs, with Technical Assistance comprising the majority of the hours. A Local Assistance Agreement will be developed annually with the lead DMA to cover accelerated effort necessary under these categories of activities to carry out the watershed project.

The costs of the educational activities completed each year are eligible for reimbursement under the Local Assistance Agreement. The activities and subsequent hours are greatest during the first three years of the project and taper off towards the later years. UWEX will be responsible for the majority of the educational activities, hours and costs.

While La Crosse County ASCS has been given the major fiscal management responsibilities, both county LCDs will also have some responsibilities. The number of hours necessary to complete the fiscal management tasks will be dependant on the number of landowners who sign cost-share agreements. As an estimate, if 200 landowners sign cost-share agreements (75% participation) approximately 1300 hours of fiscal management time will be needed spread over the eight year project life, most likely peaking in the third, fourth and fifth years of the project. This estimate is based on .5 hour for the development of the paperwork for each cost-share agreement and three reimbursement requests per cost-share agreement at two hours each.

The DMAs, including SCS, will have the majority of the project management and technical assistance responsibilities. The technical assistance and project management hours needed for the Lower Black River Watershed Project are summarized in Table 20 based on a 75% participation level to be used as an estimate of the actual hours which will be needed.

In addition, a reasonable schedule of how the project management and technical assistance might be divided among the 8 year project life is also given in Table 20. This is to aid the DMA's in knowing how much and what type of staff will be needed throughout the project to insure successful implementation.

The DMAs will be reimbursed on a calculated base level for hours applied to the implementation of the Lower Black River Watershed Project above. The base level takes into account the number of personnel available in the DMA offices, the percent of the county within the watershed and a slightly accelerated work level to account for the acknowledgement that the Priority Watershed is a critical area of the county. Figure 10 shows an example of the estimated project hours needed and the estimated base level of hours available through existing staff. If the identified activities are accomplished, the DMAs can expect to be reimbursed for the hours above that base level.

PROGRESS EVALUATION

Project progress will be evaluated quarterly and reported using the form shown in Figure 11. Annually, more detailed evaluations will be conducted by DNR and SCS.

TABLE 20: Scheduling Technical Assistance Hours Over 8 Year Project Life - 75 % Participation

Activity	Total Project Hours		Project Year 1		Project Year 2		Project Year 3		Project Year 4		Project Year 5		Project Year 6		Project Year 7		Project Year 8	
	LX	TR	LX	TR	LX	TR	LX	TR	LX	TR	LX	TR	LX	TR	LX	TR	LX	TR
Land Owner Contact	960 1,060 hours	100	600 670 hours	70	300 320 hours	20	60 70 hours	10	-	-	-	-	-	-	-	-	-	-
Pre-contact Office Inventory	195 220 hours	50	150 170 hours	20	45 50 hours	5	-	-	-	-	-	-	-	-	-	-	-	-
Cons. Plan	4,000 4,450 hours	450	1,200 1,340 hours	140	1,600 1,770 hours	170	1,200 1,340 hours	140	-	-	-	-	-	-	-	-	-	-
Cost Share Agreement	360 400 hours	40	60 70 hours	10	160 180 hours	20	140 150 hours	10	-	-	-	-	-	-	-	-	-	-
Design & Install	13,020 15,710 hours	2,690	250 350 hours	100	1,435 1,855 hours	420	2,015 2,515 hours	500	3,080 3,630 hours	550	3,110 3,665 hours	555	3,130 3,695 hours	565	-	-	-	-
Annual Contract Review	360 400 hours	40	-	-	20 25 hours	5	75 80 hours	5	110 120 hours	10	110 120 hours	10	45 55 hours	10	-	-	-	-
Practice Maint. Check	360 400 hours	40	-	-	-	-	-	-	40 45 hours	5	60 65 hours	5	85 95 hours	10	85 95 hours	10	90 100 hours	10
Subtotal	19,255 22,640 hours	3,385	2,260 2,600 hours	340	3,560 4,200 hours	640	3,490 4,155 hours	665	3,230 3,795 hours	565	3,280 3,850 hours	570	3,260 3,845 hours	585	85 95 hours	10	90 100 hours	10
Proj. Mgmt.	2,975 3,200 hours	225	500 550 hours	50	500 550 hours	50	500 550 hours	50	450 500 hours	50	425 450 hours	25	400 400 hours	-	100 100 hours	-	100 100 hours	-
TOTAL	22,230 25,840 hours	3,610	2,760 3,150 hours	390	4,060 4,750 hours	690	3,990 4,705 hours	715	3,680 4,295 hours	615	3,705 4,300 hours	595	3,660 4,245 hours	585	185 195 hours	10	190 200 hours	10

Figure 10: Distribution of Estimated Technical Assistance and Project Management Hours (75% Participation Level) Over Eight Year Project Period

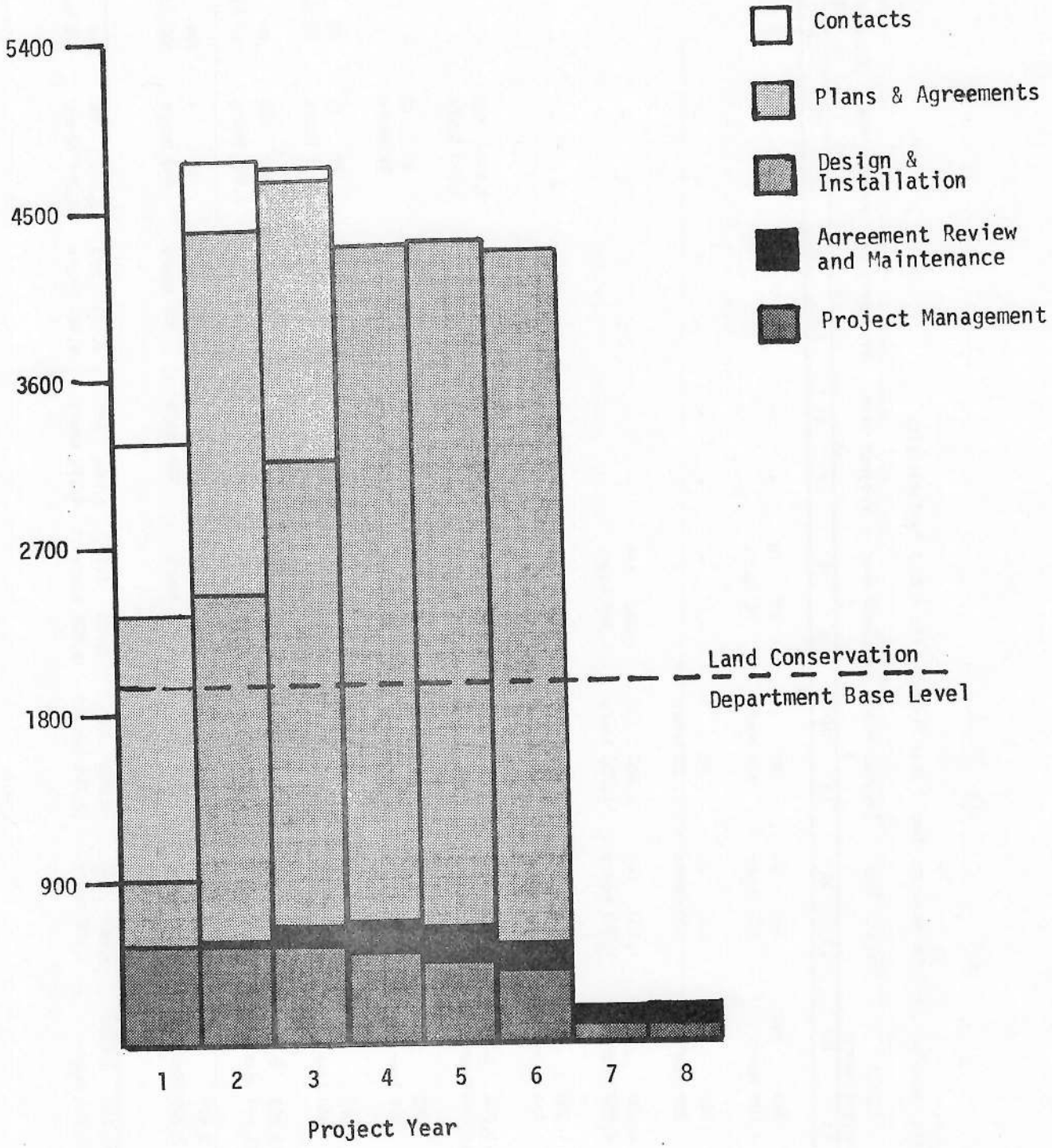

Figure 11: LOWER BLACK RIVER WATERSHED QUARTERLY PROGRESS REPORT

	Needs Estimated In Plan[1] No. and Unit	Included In Cost-Sharing Agreements 1983 1st	1983 2nd	1983 3rd	1983 4th	1984 1st	1984 2nd	1984 3rd	1984 4th	1985 1st	1985 2nd	1985 3rd	1985 4th	1986 1st	1986 2nd	1986 3rd	1986 4th	Total
Barnyard Runoff Management	105 Operations[2]																	
	% Reduction In E st. Lbs. COD Load[3]																	
Manure Storage	15 Operations[2]																	
Streambank Protection	59,000 ft. Streambanks Eroding Moderately & Severely Receiving Management 3/2																	
	Feet Streambank Fencing 3/2																	
	Feet Rip-rap																	
	Feet Shaping and Seeding																	
	39 units Crossings 2/3																	
Cropland Erosion Control	9,850 Acres at 5 T/A/Y or Greater Receiving Management 3/2																	
Pasture Erosion Control	3,360 Acres on E & F Slopes 2/3 Receiving Management 3/2																	
Woodland Erosion Control	6,510 Acres Grazed E & F Slopes Fenced 3/2																	

[1] 100% of need identified in plan
[2] Indicator of participation
[3] Indicator of accomplishment

PLAN REVIEW

At the end of the first and second project years, the practice needs and cost per practice identified in the plan will be reviewed and adjusted as needed.

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APPENDIX A

Cost-sharing for Best Management Practices

I. Introduction

The overall goal of the Wisconsin Nonpoint Source Water Pollution Abatement Program is to make the state's lakes and streams swimmable and fishable. In order to help meet this goal the program offers financial assistance to landowners, operators and municipalities for installing or applying best management practices. Best management practices are defined as:

> practices, techniques or measures which are determined to be most effective, practicable means of preventing or reducing pollutants generated from nonpoint sources to a level compatible with water quality goals. They are identified in the areawide water quality management plans and priority watershed plans.

The purposes of this booklet are to identify: 1. the rural and urban best management practices and the components of those practices eligible for cost-sharing; 2. the state maximum cost-share rates for each eligible practice; 3. the cost-sharing conditions designated management agencies must certify are being met by land users; and 4. the minimum cost-sharing conditions the land user must meet to comply with the cost-sharing agreement. Some best management practices do not require cost-sharing because they are low-cost or no-cost or provide a high degree of benefit to the land user. The practices which will not be cost-shared are listed in Section VI of the booklet. Efforts have been made to make the cost-sharing under this program as compatible as possible with the Agricultural Conservation Program (ACP), administered by the Agricultural Stabilization and Conservation Service. This booklet will be reviewed annually.

II. Cost-share rates

The Department of Natural Resources in consultation with the Board of Soil and Water Conservation Districts is required to identify a maximum cost-sharing rate for each best management practice. The maximum cost-sharing rate identified in this booklet represents a ceiling. Local designated management agencies may use any rate at or below the ceiling.

Section 144.25 of the Wisconsin Statutes states cost-share payments shall not exceed 50% of the cost of implementing the best management practice except as follows:

1. The maximum rate may be increased to as much as 70% where: a) the practice produces benefits for the applicant but the main benefits to be derived are related to improving offsite water quality and b) limiting the cost-sharing to 50% would place an unreasonable cost burden on applicants.

2. The maximum rate may be increased above 70% for certain practice where: a) the practice produces negligible benefit to the applicant with the benefits to be derived related to improving offsite water quality and b) limiting the cost-sharing payment to 70% would place an unreasonable cost burden on applicants.

In order for a specific practice to receive cost-sharing above 70%, county cost-sharing must be provided. The county cost-sharing may be matched by supplemental state cost-sharing up to 10%. For example, a streambank protection practice could have 80% state cost-sharing if the county provides 10% cost-sharing.

State funds may be the sole source of cost-sharing or may be used together with federal cost-sharing, such as ACP, up to 70%. The remaining costs must be met by county cost-sharing or borne by the landowner. For example, a manure storage facility could receive 70% cost-sharing in state funds or 35% federal funds and 35% state funds. In either case, the cost to the land user is the remaining 30%.

Additional guidance for determining cost-share rates is provided in NR 120 of the Wisconsin Administrative Code. They are:

1. Practices which are very effective for pollution control and which have high capital costs should have higher rates.

2. Practices normally used for crop or livestock production or street sweeping should have lower rates.

Table 1. summarizes an evaluation of the cost-share eligible practices in relation to four major criteria and identifies the state's maximum cost-share rate.

III. General Policies

1. Only best management practices installed at specific locations necessary to improve or protect water quality are eligible.

2. Rural and urban areas are eligible.

3. Cost-sharing is limited to areas of the state with approved areawide water quality management plans.

4. Cost-sharing is limited to priority management areas in priority watersheds or areas likely to be within a priority management area in other watersheds.

5. Cost-sharing is not available for the following:

   a. mining activities
   b. construction activities* on privately-owned lands (e.g. erosion control practices for construction of subdivisions)
   c. silviculture activities (excluding farm woodlots)
   d. septic systems (small scale onsite human domestic waste disposal systems)
   e. dredging activities
   f. practices installed primarily for flood control purposes

6. When two or more practices are of equal pollution control effectiveness and compatible with the use and management of the land, the maximum cost-share will be based on the least-cost practice. For example, a manure storage tank ($50,000) and a solid stacking pad ($8,000) may provide equal pollution control of manure. While the farmer may desire to install the more expensive manure storage facility in order to enhance his operation, cost-sharing will be based on the least cost alternative.

7. Cost-sharing is not available for practices which:

   a. are normally and routinely used in growing crops

   b. are normally and customarily used in cleaning of streets and roads

   c. have drainage of land as the primary objective

   d. installation costs can reasonably be passed on to potential consumers.

   *This does not include construction of best management practices.

IV. Best Management Practices Eligible for Cost-Sharing

The pages following Table 1 identify the best management practices and their components eligible for cost-sharing and conditions the land user must meet to comply with the cost-sharing agreement. The conditions represent a statewide minimum. Designated management agencies may make the conditions more stringent.

Designated management agencies are encouraged to coordinate local adjustments to cost-share rates and conditions with the County Agricultural Stabilization and Conservation Committees.

Table 1.

	Effectiveness	Capital Cost	Private On-site Benefit	Relationship to Customary Operating Practices	Maximum State Cost-sharing
C2 Strip Cropping	High	Low	Moderate	Moderate	50%***
C3 Diversions	High	Moderate	Moderate	Low	70%
C5 Waterways	High	Moderate	Moderate	Moderate	70%
M1 Critical Area Stabilization	High	High	Low	Low	70%*
M2 Grade Stabilization Structure	High	High	Low	Low	70%*
M3 Shoreline Protection	High	High	Low	Low	70%*
M4 Settling Basins	High	High	Low	Low	70%*
L1 Barnyard Runoff Management	High	Moderate	Moderate	Low	70%
L2 Manure Storage Facilities	High	High	Moderate	Moderate	70%**
L3 Livestock Exclusion From Woodlots	High	Low	Low	Moderate	50%
U1 Leaf Collection	High	Low	Low	High	50%
U2 Street Sweeping	Moderate	Low	Low	High	50%
U3 Infiltration System	Moderate to High	Moderate	Low	Low	70%
S2 Special Streambank Protection	High	High	Low	Low	70%

C: Generally used in cropland but may be applicable in urban areas as well
M: Applicable in both rural and urban areas
L: Livestock
U: Urban

* May be increased to 80% according to the conditions in section II on page 1
** A dollar ceiling of $6,000 is set for priority watershed projects

*** A flat rate per acre equal to the cost-share rate applied to an average installation may be used

C2 Strip cropping

Maximum cost-share rate 50%
or flat rate per acre _____

Definition: Growing crops, usually on the contour, in alternated strips of close growing crops, clean tilled row crops, and grass-legumes.

Conditions:

1. Cost-sharing is limited to establishment of the strip-cropping system and, if necessary, removal of obstacles.
2. All cultural operations must be performed as nearly as practicable on the contour.
3. To the extent practical, on acreage devoted to row crops:
   a) A crop stuble or residue must be left on the surface over the winter;
   b) A winter cover crop must be established; or
   c) Protective tillage operation must be performed.
4. The strip cropping system must be maintained for 10 years after the year of establishment.

Specifications: SCS Technical Guide specifications 585A, 585B, 585C

9/79

C3 Diversions

Maximum cost-share rate 70%

Definition: Structure installed to divert water from areas where it is in excess to sites where it can be used or transported safely. Usually the system is a channel with a supporting ridge on the lower side constructed across the slope at a suitable grade.

Conditions:

1. An adequate outlet must exist.
2. Cost-sharing is authorized for:
   a) Diversions, ditches, dikes or subsurface drains. Cost-sharing for subsurface drains is limited to areas on sloping land where the internal water seeps to the surface and causes the land or cover to lose its stability.
   b) Installation of structures such as pipe, underground outlets, or other outlets, if needed, for proper functioning to a ditch or dike, for more even flow, or to protect outlets from erosion.
   c) Necessary leveling and filling to permit installation of an effective system.
   d) Removing obstructions necessary to permit establishment of the practice.
3. Cost-sharing is not authorized for ditches or dikes designed to impound water for later use, or which will be a part of a regular irrigation system.
4. The system must be maintained for a minimum of 15 years following the year of installation.

Specifications: SCS Technical Guide specifications 362, 606, 607, 412

9/79

C5 Waterways

Maximum cost-share rate 70%

Definition: A natural or constructed watercourse shaped, graded and established in suitable cover as needed to prevent erosion by runoff waters.

Conditions:

1. Cost-sharing is authorized for site preparation, grading, shaping, filling, and establishing permanent vegetative cover. Cost-sharing is also authorized for subsurface drains necessary for proper functioning of the waterway.
2. The cover may consist of sod-forming grasses, legumes, mixtures of grasses and legumes or other types of vegetative cover that will provide the needed protection from erosion.
3. Close-sown small grains, annuals or mulching may be used for temporary protection if followed by eligible permanent vegetative cover established by seeding or natural revegetation.
4. The practice shall be maintained for a minimum of 10 years following the year of installation.

Specifications: SCS Technical Guide specifications 342, 412, 484, and 606

9/79

M1 Critical Area Stabilization

Maximum cost-share rate 70%

Definition: Planting suitable vegetation on highly erodable areas (e.g. gulleys, roadsides, construction activities on public lands).

1. Cost-sharing is authorized for:
   a) Permanent fencing to protect the site.
   b) Planting trees, shrubs, perennial grass cover.
   c) For shaping and smoothing prior to the installation of protective structures or plantings.
2. The practice must be maintained for a mimum of 25 years after the year of installation.

Specifications: SCS Technical Guide specifications 342, 472, 484, 512 and 612.

9/79

M2 Grade Stabilization Structures Maximum cost-share rate 70%

Definition: A structure used to reduce the grade in a channel in order to protect the channel from erosion or to to prevent the formation or advance of gullies.

Conditions:

1. Cost-sharing is authorized for:
   a) Channel linings, chutes, drop spillways, and pipe drops to discharge excess water.
   b) Fencing and vegetative cover (including mulching needed to protect the structure) and for leveling and filling to permit the installation of the structure.
2. The structure shall be maintained for a minimum of 25 years following the year of installation.

Specifications: SCS Technical Guide specifications 402, 350, 382, 410, 425 and 468.

9/79

M3 Shoreline Protection (Streambank Protection) Maximum cost-share rate 70%

Definition: Stabilizing and protecting banks of streams and lakes against erosion.

Conditions:

1. Cost-sharing is authorized:
   a) For permanent fencing to protect banks from damage by domestic livestock.
   b) For planting trees, shrubs, perennial grass cover as filter strips or buffer zones along banks.
   c) To limit livestock access to water.
   d) To install livestock and machinery crossings that will minimize disturbance of the stream channel and banks.
   e) For placement of riprap and other materials on the bank when other practices are not practical.
   f) For shaping and smoothing banks prior to the installation of protective structures or plantings.
2. Livestock must be excluded from the sloped and planted area.
3. The practice shall be maintained for a minimum of 10 years following the calendar year of installation.

Specifications: SCS Technical guide specifications 326, 382, 580 and 342 and DNR fish management specifications.

9/79

M4 Settling Basin

Maximum cost-share rate 70%

Definition: An impoundment created to retain sediment and other pollutants carried by runoff waters.

Conditions:

1. Cost-sharing is authorized:

   a) For detention or retention structures, such as erosion control dams (excluding water storage type dams), desilting reservoirs, sediment basins, debris basins, or similar structures.

   b) For channel linings, chutes, drop spillways, and pipe drops that dispose of excess water.

   c) For fencing and vegetative cover (including mulching needed to protect the structure) and for leveling and filling to permit the installation of the structure.

2. Cost-sharing is not authorized for structures with a primary purpose of flood control or creation of a permanent pool.

3. The structure must be maintained for a minimum of 25 years following the year of installation.

Specifications: SCS Technical Guide specifications 402, 350, 382, 410, 425 and 468

9/79

L1 Barnyard Runoff Management

Maximum cost-share rate 70%

Definition: Using structural practices such as gutters, downspouts and diversions to intercept and redirect surface runoff around the barnyard, feeding area or farmstead, and/or to collect, convey and temporarily store runoff from the barnyard, feeding area or farmstead.

Conditions:

1. Cost-sharing is authorized for:

   a) Diversions, gutters, downspouts, collection basins, infiltration areas, waterway outlet structures, piping and land shaping needed to manage runoff from areas where livestock manure accumulates.

   b) Measures needed for the establishment of perennial grasses, including fertilizers and other minerals.

   c) Permanent fencing.

2. The practice must be maintained for a minimum of 15 years following the year of installation.

Specifications: SCS Technical Guide specifications 312, 342, 362, 382, 412, 425 and 606.

9/79

L2 Manure Storage Facilities Maximum cost-share rate 70%/$6,000

Definition: A structure for temporary storage of manure.

Conditions:

1. Cost-sharing is authorized for:

   a. Aerobic or anaerobic lagoons, liquid manure tanks and solid manure stacking facilities and equipment necessary for transporting manure to the storage facility required as part of a manure management plan.

2. Cost-sharing is not authorized for:

   a. Operations where manure can be spread on location which are nearly flat land or which do not drain to surface waters.

   b. Portable pumps and other portable equipment;

   c. Buildings or modifications to buildings;

   d. Equipment for spreading or incorporating manure; and

   e. That portion of the facility installed under or attached to buildings serving as part of the building or its foundation.

3. Storage facility must have a minimum of 180-day storage capacity.

4. Runoff from solid manure stacking facilities must be controlled.

5. Manure must not be spread when the ground is frozen or saturated.

6. Manure must be incorporated into the soil as soon as practicable after spreading.

7. Lagoons must be constructed to assure sealing of the bottom and sides in order to prevent contamination of wells and groundwater.

8. The practice must be maintained for a minimum of 20 years following the year of installation.

Specifications: SCS Technical Guide specifications 313, 425 and 359

9/79

L3 Livestock Exclusion from Woodlots* Maximum cost-share rate 50%

Definition: Protection of woodlots from livestock grazing by fencing or other means.

Conditions:

1. Cost-sharing is authorized for permanent fencing.

2. Livestock must be excluded from the woodlot.

3. The practice must be maintained for a minimum of 20 years following the year of installation.

Specifications: SCS Technical Guide specifications 382, 472.

* Livestock exclusion from streambanks is included as part of shoreline protection.

9/79

U1 Leaf collection

Maximum cost-share rate 50%

Definition: Collection or management of leaves, seeds, grass clippings and other vegetative matter in order to prevent accumulation in gutters and leaching of nutrients.

Conditions:

1. Cost-sharing is authorized for equipment (or prorated portion of time that equipment is used) or manpower required to increase the frequency and/or efficiency of vegetative matter collection for a one-year period.

2. Cost-sharing for this practice will not be approved for a municipality more than once.

3. The practice must be maintained for a minimum of 5 years after the initial year.

9/79

U2 Street sweeping

Maximum cost-share rate 50%

Definition: Mechanical street sweeping to remove vegetative matter, debris and particulates from gutters.

Conditions:

1. Cost-sharing is authorized for equipment (or prorated portion of time that equipment is used) and manpower required to increase street sweeping efficiency or frequency to more than once every two weeks during the period of April 1 to November 1 for a one-year period.

2. Cost-sharing for this practice will not be approved for a municipality more than once.

3. The practice must be maintained for a minimum of 5 years after the initial year.

9/79

U3 Infiltration systems

Maximum cost-share rate 70%

Definition: Structures such as dutch drains, porous pavement, lattice blocks and dry wells which increase infiltration and reduce runoff from impervious surfaces.

Conditions:

1. Cost-sharing is authorized for:

   a) excavation, grading and shaping;

   b) construction materials and

   c) installation of materials

2. Cost-sharing is not authorized for the portion of the total costs normally associated with conventional systems (i.e. costs associated with conventional paving of parking lots or roadways is not considered as an eligible cost).

3. The practice must be maintained for a minimum of 10 years after the year of installation.

9/79

V. Substitute Practices

The Wisconsin Nonpoint Source Water Pollution Abatement Program allows for substitute management practices. Substitute management practices are simply innovative or rarely used - yet effective and practicable management practices-not identified as best management practices in areawide water quality management plans. They may be eligible for cost-sharing.

Substitute management practices must be reviewed and approved by the designated management agency and the Board of Soil and Water Conservation Districts. The Department of Natural Resources will identify whether the practice is eligible for cost-sharing and assign a maximum cost-sharing rate.

SCS Technical Guide standards and specifications will be used where available. If standards and specifications are not available, the SCS Technical Guide work group will review the request and recommend design criteria.

S-2 Special or Substitute Practice - Streambank protection for areas where the topography limits the practicality of fencing cattle from both sides of a stream without significantly restricting the landowner's use of the adjacent land.

(a) Description: Fencing installed in such a location as to restrict cattle access from both sides of an entire length of stream. The practice is intended to be used where fencing one end of a narrow stream valley is a more practical method of excluding cattle from the stream than fencing both sides of the stream reach and where the landowner loses the pasture use of the acres included in the fenced area.

(b) Conditions:

1. Cost sharing shall be based on the equivalent length of streambank protected as measured by the length of fencing which would be needed to adequately protect the stream reach.

2. Cost-sharing for this practice shall not be authorized for situations where the landowner does not suffer significant land use restrictions due to the fencing installed.

3. The installation period is considered to be less than 1 year.

4. The practice shall be maintained for a minimum of 15 years followed the installation period.

(c) Cost-Sharing: The cost-sharing rate shall be 70% of the installation cost of the equivalent length of fencing. A flat per foot or per rod rate, based on average installation costs, may be used. The basis for this calculation must be submitted to and approved by the Department prior to use.

VI. Best Management Practices not Eligible for Cost-sharing

The following best management practices are not eligible for cost-sharing. All are very effective practices. However, they are either low-cost no-cost or high benefit to the land user. Their use should be encouraged.

Cultural Management - Proper timing, location, and intensity of cropping operations from seedbed preparation to harvest to reduce nonpoint source pollution while achieving optimum production. Spring plowing as opposed to fall plowing is an example of a type of cultural management prevalent in Wisconsin.

Facility Location - An alternative pollution control measure for barnyards, feedlots, and supporting activities is properly locating the facility.

Fertilizer and Irrigation Water Management - The correct application of fertilizers to reduce their potential as a pollutant. This will involve the proper timing and placement of fertilizer applications and using the proper type and quantities for the crops being grown. While excessive fertilizer applications can be detrimental to water quality, soils low in fertility are often more subject to erosion because of reduced ground cover. Fertilizer management is most critical in irrigated areas where proper coordination of fertilizer application with irrigation activities is essential.

Livestock Management - To prevent damages from overgrazing. This can involve rotational grazing, measures to promote uniform grazing, and delayed or deferred grazing to allow plant growth. Livestock management is also applicable in barnyards and feedlots for animal waste control.

Pesticide Management - The proper timing, placement, and quantities of pesticides to prevent degradation of water quality. Also included are proper container disposal and proper clean-up methods.

Waste Disposal Management - The proper timing, rate, and location of animal waste disposal to prevent discharge of organic wastes and nutrients into receiving waters. Wastes would include manure and collected barnyard runoff.

Winter Cover Crop - A crop of close-growing grasses, legumes, or small grain used to control erosion during periods when the major crops do not furnish adequate cover. In Wisconsin these crops are applicable on sloping land where corn is removed for silage, soybeans harvested, and in orchards. Cover crops are also used following removal of tobacco, potatoes, and canning crops.

Crop Residue Use - Using plant residues to protect the soil during critical erosion periods. This involves leaving plant residues on the surface after harvesting and incorporation into the soil just prior to planting operations. The protection afforded the soil varies with the amount of residues produced and amount remaining on the surface after tillage. Crop residues also conserve moisture and increase infiltration. Crop residues can be a source of organic wastes if subjected to excessive runoff and utlimate discharge into receiving waters. Decay of plant residue makes soluble phosphorus available to runoff.

Crop Rotation - Growing different crops in a regular sequence as part of a planned cropping system to reduce erosion. Crop rotation is routinely used by many landowners in Wisconsin and serves as an example of a management practice that is beneficial to the farmer and reduces pollutant discharge.

Pasture and Hayland Planting - Establishing and reestablishing long-term stands of adapted species of perennial or reseeding forage plants.

APPENDIX B

Lower Black River Watershed Educational Activities

The educational program is designed to provide sufficient educational opportunity to meet the needs of the various landowners in their decision making regarding participation in the watershed project. It is based on the activities that are detailed in the timetable accompanying the Implementation Strategy of the plan.

Each of the activities is designed to meet a specific need identified by either the planning group or by the landowners themselves. The paragraphs that are following describe each of the activities to be undertaken during the eight-year implementation period.

NEWSLETTERS - This is the major communication item to provide all landowners and units of government in the Watershed awareness about the project and specific information about practices and the policies of the project regarding the implementation of those practices. The newsletters will be published quarterly during the landowner sign-up period and twice annually for the remaining five years, co-ordinated by UWEX.

SMALL GROUP MEETINGS - There will be two types of small group meetings to serve two distinct sets of clientele. The first is a series of small group meetings of the general public to be held throughout the project period which are essentially awareness-building meetings to inform civic groups of project progress and encourage participation. These will be co-ordinated by UWEX. The second type of small group meetings will be directed towards rural landowners to discuss the available practices, encourage participation and facilitate landowner decision making regarding practice installation. These will occur during the first three years and be co-ordinated by the LCD.

LETTERS OF INTEREST - These letters will be designed to inform the landowners of the merits of a management plan and practice applications for correcting the nonpoint source water quality problems within the watershed. The letters will explain the project, what is available with respect to cost-sharing and technical assistance and ask the landowner to reply on an enclosed card to seek further contact from the project staff. The returned cards will then be used to comprise a list of people to be contacted following the policies set in the Lower Black River Watershed plan. This letter will serve as a first, second and possibly third contact for some landowners and will be co-ordinated by the LCD.

BMP SALES BOOKLET - This is a three-ring binder with color photographs of individual land management practices used to provide visual, as well as some written explanation of the merits and the "how-to" of particular practices. Six of these books will be made available for use by the field staff when contacting landowners and in both the SCS and ASCS offices, as well as in the Extension Office. It may be necessary to update the books through time as better examples of practices within the watershed become available. Both UWEX and the LCD will help develop these notebooks.

INFORMATION PACKETS - This is a pocket folder with the watershed name and insignia on the front containing materials, written and visual, that explain the purpose of the watershed project, who is involved, the responsibilities and benefits of landowners receiving cost-sharing, and individual Extension fact sheets and brochures on certain management practices. One information packets will be put together for each potential co-operator in the watershed by co-operative effort of UWEX and the LCD.

OFFICIALS' TOUR - This tour is designed to acquaint County Board Supervisors, Town, City and Village officials with the purpose and the ways in which the watershed project would be carried out and the benefits it will bring to the communities. The first year tour will also explain what roles local government, County, City, Village and Township, can have to assist in the implementation of the plan. There would be particular emphasis placed on the public policies of those units of government, as they relate to landuse in the management of public lands. The wrap-up tour the last year of the project will essentially highlight the accomplishments of the watershed project. These tours will be coordinated by UWEX.

TILLAGE TOUR - A tillage tour is designed to acquaint interested landowners with the methods and results of conservation tillage and to explain the importance of conservation tillage to meeting the goals of the Lower Black River Watershed project. The tour will attempt to look at various methods of tillage, compare the yields from local farms using these methods of tillage, and get the experiences of the individuals farming communicated to the tour participants. UWEX is the contact agency.

TILLAGE PLOTS - The tillage plots are designed to provide local first-hand evidence and information about the effects and importance of conservation tillage. The educational portion of the plots coordinated by UWEX, is to provide communication to landowners in the watershed about the plots as well as provide results of the individual plots to be compiled on handouts which will be used in the tillage tour. The plots will have signs so that individuals passing by will notice them and stop to inspect the various methods of tillage and the cropping results.

ELK CREEK WATERSHED TOUR - This tour is intended to acquaint landowners within the Lower Black River Watershed with successful practices, especially barnyard management schemes, that have been implemented in the Elk Creek Watershed, as well as other watersheds in Trempealeau and La Crosse Counties. This will provide landowners with examples of solutions to serious barnyard and other problems, as well as providing them with a chance to talk with the farmers and landowners who have participated in cost-sharing program under the Wisconsin Fund. It is the goal of the watershed tour to provide as many examples of varying kinds of management as is available within a reasonable distance of the Lower Black River Watershed. The tour is also an important part of the Manure Management Workshop to be held the following year. Both the LCD and UWEX will be involved in developing the Elk Creek Watershed tour.

BARNYARD RUNOFF MANAGEMENT WORKSHOP - This workshop is designed to meet the needs of landowners having manure management problems and will expand on the information provided and gained in the Elk Creek Watershed tour the previous

year, as well as meet the needs of those individuals who have not participated in the previous tour. The workshop will cover all facets of manure management, to facilitate better use of this resource, as well as in preventing water quality problems from wash-off to streams.

BARNYARD RUNOFF MANAGEMENT DEMONSTRATION - A landowner located in a visible location, participating in the cost-share program for barnyard runoff managememt will be asked to be used as a demonstration site for manure management. The activity will include signs and informational materials on the manure management system, as well as allowing visits by the watershed staff, coordinated by the LCD, with interested landowners to the demonstration site. In this way the individual can provide first-hand information on his experiences to those considering solutions to their manure management problems.

INSTALLER/CONTRACTOR WORKSHOPS - These workshops were designed to help contractors become more skillful in the land measurement so that the necessary grades and slopes critical to soil erosion work can be implemented. This would mean that the contractors would have hands-on experience in operating levels, as well as practical discussions of applications of erosion control techniques to construction sites and to installation of management practices on farmsteads. Both UWEX and the LCD will be involved with this activity.

WOODLAND FIELD DAY - This field day would have a two-fold goal, with one being the reduction of run-off pollutants through proper management techniques in harvesting, elimination of cattle from woodlots and road construction, and the other being better management of woodlands to better use this renewal resource. This is particularly important because of the amount of woodland that is found in the watershed, as well as the steepness of the slopes on which the woodland is situated and past use made of a significant portion of the woodland for pasture. The DNR Forester and UWEX will be involved in organizing this activity.

URBAN WORKSHOPS - These workshops conducted by UWEX will be of interest to the suburban and rural homeowner to acquaint them with proper soil and water management techniques to reduce soil loss and water pollution from improper homesite management. This is particularly important in the watershed because many of the rural homesites are located on steep terrain where the potential for serious soil loss and sediment transport to streams is high.

SOIL MANAGEMENT CLASS - These classes are to increase the awareness of the farmers in the watershed for proper soil management to protect water quality as well as facilitate improved agricultural production. The classes will acquaint the farmer with the basics to understand soils and the soils of the Lower Black River Watershed, as well as the long-term effects of proper management with accompanying conservation practices.

YOUTH/SPORTS CLUB HABITAT IMPROVEMENT DAY - Certain portions of streams in the watershed, such as Halfway Creek and other tributaries, have been, in the past, identified as Class II trout waters. With the cooperation of the adjoining landowners, both local sportsmen's clubs, FFA and 4-H, would be solicited to work on habitat improvement in these streams to curtail the loss of habitat, improve conditions for the survival of native trout and improve

relationships between the stream recreations and the landowners. The activity will be coordinated by UWEX with assistance from DNR fish managers. Financial assistance will be requested through the Department's Trout Stamp or Trout Habitat Improvement programs if deemed necessary and appropriate.

APPENDIX C

FORMS

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT PROGRAM COST-SHARE AGREEMENT
SECTION 144.25, WIS. STATS.
FORM 3400-68 REV. 8-82

Cost-Share Agreement Number	Total Est. Grant Amount
	$

Name of Grant Recipient	Telephone Number
EXAMPLE FORM ONLY	

Street or Route

City, State, Zip Code

Legal Description of Property

Name of Landowner (if other than Grant Recipient)	Telephone Number

Street or Route

City, State, Zip Code

Name of Designated Mgt. Agency	Telephone Number

Street or Route

City, State, Zip Code

Installation Period
From To

SECTION 1. AGREEMENT PROVISIONS

1. The grant recipient agrees:
   A. To install the best management practice(s) listed in section 2 consistent with the specifications listed in section 3 during the installation period identified above.
   B. To operate and maintain each best management practice for the life span identified in section 2.
   C. To certify, on forms provided by the designated management agency, best management practices installed under this agreement are being maintained.
   D. To repay the full amount of the cost-share payments made and forfeit all rights to future cost-share payments if:
      (1) Any best management practice is rendered ineffective during its life span due to improper maintenance, operation or neglect;
      (2) The applicable conditions identified in section 3 are not met; or
      (3) The grant recipient adopts any land use or practice which defeats the purposes of the best management practices.
   E. To retain responsibility for this agreement if a change in ownership occurs unless the new owner assumes, in writing, the operation and maintenance of the best management practices and other provisions of this agreement pertaining to the grant recipient.
   F. Not to discriminate against contractors because of age, race, religion, color, handicap, sex, physical condition, developmental disability, or national origin, in the performance of responsibilities under this agreement.
2. The designated management agency agrees:
   A. To provide technical assistance for best management practices identified in section 2.
   B. To make cost-share payment after receipt of a payment request and evidence of completion status.
3. Satisfactory evidence of completion status will consist of a technical performance report signed by a technician assigned by the designated management agency.
4. The total state cost-share payment for each practice identified in section 2 shall be based on the cost-share rate for the practice as applied to the eligible costs actually incurred, as substantiated to the designated management agency. If the total cost-share payment for a practice identified in section 2 exceeds the estimated grant amount for that practice, payment of the overrun will be made only if there are funds available.
5. The agreement may be amended, by mutual agreement, during the installation period as long as the changes will provide equal or greater pollution control.

C-1

SECTION 2. BEST MANAGEMENT PRACTICES, COSTS, INSTALLATION SCHEDULE, LIFE SPANS

This section contains all best management practices, both those eligible for cost-sharing and those not eligible, needed to control significant nonpoint sources in eligible areas owned or operated by the grant recipient.

1. Cost-shared best management practices

Location (Field Number)	Practice Code	Practice Title	Quantity	Units	Estimated Total Cost	Cost-Share Rate	Estimated Cost-Share Amount	Cost-Sharing From Other Programs *	Year of Instal-lation	Practice Life-span
				Total		Total		*Identify program		

2. Noncost-shared best management practices

Location (Field Number)	Practice Code	Practice Title	Quantity	Units	Year of Installation	Practice Life-span

SECTION 3. BEST MANAGEMENT PRACTICE CONDITIONS

Attached are the conditions for each best management practice listed in section 2.

Grant Recipient or Authorized Representative's Signature	Date Signed	Authorized Representative of Des. Mgt. Agency - Signature	Date Signed
Title		Title	

State of Wisconsin
Department of Natural Resources
Box 7921
Madison, Wisconsin 53707

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT PROGRAM — COST SHARE CALCULATION AND PRACTICE CERTIFICATION FORM
Section 144.25, Wis. Stats.
Form 3200-53

9-82

_____ Priority Watershed Project: EXAMPLE FORM ONLY _____ County

Agreement Number	Name and Address
Telephone Number (Include Area Code)	

COST SHARE CALCULATION

Practice Code	Practice Name	Units Installed	*	Total Cost of Practice	Cost Share %	Cost Share For Practice
				$		$
					TOTAL	$

*Place 0 if there are more of this type of practice on this agreement to install.
Place 1 if these units complete the installation of this practice for this agreement.

Amount Paid	Check Number	Check Date YY — MM — DD

PRACTICE CERTIFICATION

I certify the above practice or practices and practice units have been installed in accordance with the appropriate standards and specifications.

Signature	Title	Date Signed

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

REQUEST FOR ADVANCE OR REIMBURSEMENT
WISCONSIN FUND - NONPOINT SOURCE PROGRAM

FORM 3400-70 10-79

Complete Items 1 through 8 and 13 for all payment requests. See instructions on reverse side for completing Items 9 through 12. Send one copy of this form to:

Wisconsin Department of Natural Resources
Bureau of Finance, Audit Section
Box 7921
Madison, Wisconsin 53707

1. GRANTEE/DMA	2. COUNTY	3. GRANT NO.	4. PAY. REQ. NO.
EXAMPLE FORM ONLY			

5. MAIL CHECK TO:	6. PERIOD COVERED BY THIS REPORT (MO-DAY-YR): FROM TO	
	7. TYPE OF PROJECT ☐ PRIORITY WATERSHED ☐ LOCAL PRIORITY	8. TYPE OF REQUEST ☐ ADVANCE ☐ PARTIAL ☐ FINAL

	AMOUNT	LEAVE BLANK DNR USE ONLY
9. Request for Advance Payment		
a. Initial State Grant Amount		
b. Advance Payment Requested (Maximum 10% of Above)		
10. Summary of Payment Requests		
a. Reimbursement Requested This Claim (From Form 4400-47)		
b. Total Prior Pay Requests (Including Advance)		
c. Total All Payment Requests to Date		
11. Computation of Maximum Partial Payment		
a. Total Cumulative Grant to Date		
b. Enter 95% of Above Total		
12. Computation of Net Payment Due		
a. Enter 95% of Total Cumulative Grant (Line 11b. Above)		
b. Less: Total Prior Payment Requests (Line 10b. Above)		
c. Net Payment Due (Line 12a. Minus Line 12b.)		
	Amount Allowed This Claim	

13. CERTIFICATION:

I certify that to the best of my knowledge and belief the billed costs of expenditures are based on actual payments of record and are in accordance with the terms of the project agreement and the reimbursement represents the grant share due which has not been previously requested.

Auditor Initials _____

Date _____

Bur. Finance Initials _____

Date _____

SIGNATURE OF AUTHORIZED REPRESENTATIVE	DATE SIGNED
TYPED OR PRINTED NAME AND TITLE	TELEPHONE NO. (INCLUDE AREA CO EXTENSIONS)

INSTRUCTIONS

Item 9 - Complete for Advance Payment Request Only

9a Enter the amount of grant shown on the original agreement.
9b Advance requested may not exceed 10% of original grant amount.

Item 10 - Complete for Partial and Final Payment Requests. (See required attachments below.)

10a Enter total amount from worksheet (Form 4400-47) attached to this pay request.
10b Enter total amount of all previous payment requests, including the advance.
10c Sum of 10a and 10b.

Item 11 - Complete for Partial Payment Requests Only

11a Enter the sum of the original grant amount and any amendment increases.
11b Enter 95% of the above amount, which represents the maximum that shall be paid on a grant prior to final accounting and audit. (Compare this amount with Item 10c before completing Item 12.)

Item 12 - Complete for Partial Payment Requests Only when the amount shown on line 10c above exceeds the amount shown on line 11b.

12a & b Self-explanatory.
12c The net result when subtracting line 12b from line 12a is the maximum amount which may be paid with this pay request.

REQUIRED ATTACHMENTS

Attach the following documentation with each Partial and Final Payment Request:

1. One copy of reimbursement claim worksheet (Form 4400-47) listing individual payments on cost share agreements.

2. Photocopy of cost share agreements (Form 3400-68) for each payee listed in this report. (If not previously submitted.)

3. Photocopy of form showing approval of final cost share amount by the DMA for each practice listed in this report.