Village of Winneconne Wastewater Facility

This aerobic digestion activated sludge facility is located on the western side of the village. However, the plant does serve the eastern portion of the village which is located within the project boundaries. The facility is currently operating within its .495 MGD design capacity and is in the Voluntary Action Range on the Compliance Maintenance Annual Report. This facilities WPDES permit is scheduled to be reissued in 1993.

Land Application of Sludge

Sludge is the solid or semi-solid portion of treated wastewater. The re-use of sludge through land application is considered a beneficial recycling of nutrients and a valuable soil conditioner. Use of sludge in this manner is also considered to be the safest and most cost effective means for the treatment facility to dispose of the material.

Land application of sludge is regulated under NR 204 to ensure that environmental and public health concerns such as proper soil types, depth to groundwater, distance from surface water, and type of crop to be grown on sludge amended fields are taken into consideration when the DNR approves agricultural fields for sludge application.

There is very limited land application of sludge occurring in the Arrowhead River, Rat River and Daggets Creek watershed, due primarily to the type of treatment facilities located in the area. Lagoon type systems rarely if ever need to have sludge removed. Any site receiving sludge would be required to be approved by the DNR before application.

Septage and Holding Tank Waste Disposal

The disposal of septage (septic tank semi-solid / liquid material) and holding tank wastes are regulated under NR 113. The preferred alternative for both materials is treatment at a nearby wastewater treatment facility. If land application of septage is chosen as the disposal method, a site approval must be obtained from the DNR, and disposal must be carried out in accordance with NR 113 procedures.

NR 113.08(1)(c)4. specifies that holding tanks located within 20 miles of a publicly owned treatment plant must have their contents disposed of at the treatment plant by the waste hauler. This provision applies to all of Outagamie and Winnebago counties, and includes the entire watershed project area as the entire watershed is within 20 miles of a facility.

Failing Septic Systems

The Wisconsin Fund Private Sewage System Replacement Grant Program is a financial assistance program designed to help homeowners and small business operators offset the costs of replacing a failing septic system. The program is now administered by the

Department of Industry, Labor and Human Relations. Both Outagamie and Winnebago counties are currently participating in the program.

The grant program applies to principal residences and small businesses built prior to July 1, 1978, and is subject to income and size restrictions. Seasonal homes are not eligible for participation in this program. Interested individuals should contact either their county zoning department or the DILHR for further information.

Land Disposal Facilities

The landfills located in the Arrowhead River, Rat River and Daggets Creek watershed are primarily small landfills most commonly known as "town dumps". Several smaller private dumps and demolition landfills are also present in the watershed and are listed in the Registry of Waste Disposal Sites in Wisconsin (PUBL-SW-108-89). All landfills in the project area are now closed. Prior to covering and closure, the wastes in these town dumps were burned. The closure process included a consideration of the potential for groundwater contamination. Although there is no certainty about eventual contamination, the landfills are not expected to present a problem. No groundwater monitoring is being conducted at any of the landfill sites.

- Town of Winchester in Winnebago County (SW, NW, 04, 20N, 15E). Closed in 1991.
- WI DNR, Deer Pit in Winnebago County (SW, SE, 09, 20N, 15E). Closed in 1988.
- Town of Winneconne in Winnebago County (SW, SE, 02, 19N, 15E). Closed in 1989.

Other Contaminated Sites

The document entitled *Wisconsin Remedial Response Site Evaluation Report* (PUBL-SW-144-91) is a compilation of the following:

- The Inventory of Sites or Facilities Which May Cause or Threaten to Cause Environmental Pollution, (s. 144.442(4)(a), Stats);
- The Spills Program List which includes sites or facilities identified under the Hazardous Substance Spill Law, (s. 144.76, Stats.); and
- The LUST Program List which includes sites identified through the Leaking Underground Storage Tank (LUST) program, (s.144.76, Stats.).

The Bureau of Solid Waste Management within the Department of Natural Resources may be contacted for more information concerning sites listed in this document.

CHAPTER FOUR
Recommended Management Actions: Control Needs and Eligibility for Cost-share Funding

Introduction

This chapter describes the management actions developed to meet the pollution reduction goals established during the water resource appraisal process. Also described below are the criteria which will determine the eligibility of each pollutant source for cost-share funding through the Nonpoint Source Program.

Management Categories

Nonpoint source control needs are addressed by assigning "management categories" to each major nonpoint source of pollution site (barnyards, winter spread manure, upland fields, gullies, shoreline and streambank erosion or habitat degradation sites). Management categories define which nonpoint sources are eligible for financial and technical assistance under the priority watershed project. Categories are based on the amount of pollution generated by a source, and the feasibility of control. Management category eligibility criteria are expressed in terms of tons of sediment delivered to surface waters from eroding uplands, gullies, shorelines and streambanks; pounds of phosphorus delivered to surface waters annually from animal lot and winter spread manure runoff; and whether or not cattle are permitted access to a surface water. A definition of each management category is given below. Following the definitions are the criteria used to define the management categories for each pollutant source for this project.

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

Management Category I

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

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

Management Category II

Nonpoint sources in this category collectively contribute less of the pollutant load than those in Management Category I. These nonpoint sources are identified and included in cost-sharing eligibility to provide additional pollutant reduction in the event that all sources in Management Category I are not controlled. Due to the limited state funding available for watershed projects, the size of this category is relatively limited.

Nonpoint sources in Category II are eligible for funding and/or technical assistance under the priority watershed project. To participate in this project, it is not mandatory for a landowner to control sources in this category.

Management Category III

Nonpoint sources of pollution in this category do not contribute a significant percentage of the pollutants impacting surface waters, or fall outside of the scope of availability of funding for Management Category II, and are not eligible for cost-share funding under the priority watershed project. Other Departmental programs (e.g. wildlife and fisheries management) can, if warranted, assist county project staff to control these sources as implementation of the integrated resource management plan for this watershed. Other federal and state programs such as the Agricultural Conservation Program (ACP) may also be applicable to these sources.

Criteria For Eligibility of Nonpoint Pollutant Sources

As stated in chapter three, the water quality objectives for the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project are to reduce both phosphorus and sediment by 50% from their current estimated loading rates. Tables 4-1 and 4-2 show the current estimated pollutant loadings from each source and the associated planned level of control necessary to reach the water quality objectives.

Table 4-1. ARD Phosphorus Reduction Strategy (Management Category I)

Subwatershed	Annual P Loading Barnyards (lbs.)	%	Annual(1) P Loading Cropland (lbs.)	%	Annual(1) P Loading Gullies (lbs.)	%	Annual(1) P Loading Banks (4) (lbs.)	%	Annual(2) P Loading Manure (lbs.)	%	Annual P Loading Other (5) (lbs.)	%	Total (3) Subwatershed P Loading (lbs.)	%
Arrowhead River	1140	9	6282	52	3607	30	19	0	535	4	585	5	12168	31
Daggets Creek	327	7	3603	79	182	4	5	0	131	3	337	7	4586	12
Dale Swamp	606	12	1611	32	1910	38	37	1	176	4	641	13	4981	13
Lake Butte Des Morts	197	10	1286	66	216	11	30	2	37	2	180	9	1945	5
Lower Rat River	496	13	1830	49	64	2	0	0	730	19	624	17	3744	10
Upper Rat River	790	9	4045	45	2149	24	62	1	975	11	1025	11	9046	23
Winneconne-Poygan	123	5	1428	64	36	2	179	8	80	4	401	18	2247	6
Watershed Totals	3679	10%	20086	52%	8164	21%	331	1%	2664	7%	3793	10%	38717	100%

Subwatershed	P Control Planned Barnyards (lbs.)	%	P Control Planned Cropland (lbs.)	%	P Control Planned Gullies (lbs.)	%	P Control Planned Banks (lbs.)	%	P Control Planned Manure (lbs.)	%	Total Planned P Control (lbs.)	%
Arrowhead River	601	8	3766	51	2705	37	8	0	290	4	7371	19
Daggets Creek	133	6	2125	89	137	6	4	0	0	0	2399	6
Dale Swamp	474	17	756	27	1432	51	13	0	108	4	2784	7
Lake Butte Des Morts	64	8	543	69	162	20	22	3	0	0	791	2
Lower Rat River	63	5	878	65	48	4	0	0	362	27	1351	4
Upper Rat River	490	12	1482	36	1612	39	1	0	570	14	4154	11
Winneconne-Poygan	53	10	295	58	27	5	134	26	0	0	509	1
Watershed Totals	1878	10%	9846	51%	6123	32%	182	1%	1330	7%	19359	50%

(1) Assumes 1.24 lbs. P / 1 ton sediment (calculated)
(2) Assumes 42% animal waste load is manure spread runoff / stacking leachate (Moore, 1979)
(3) Assumes 0.46 lbs. P/acre loading from all sources (Green Bay RAP, TAC, 1987)
(4) Includes streambanks and shorelines
(5) Includes all developed areas, woodlots, wetlands, and grasslands

Table 4-2. ARD Sediment Reduction Strategy (Management Category I)										
Subwatershed	Annual Cropland Sediment (tons)	%	Annual(1) Banks Sediment (tons)	%	Annual Gullies Sediment (tons)	%	Annual(2) Other Sediment (tons)	%	Total Annual Subwater shed Sediment (tons)	%
Arrowhead River	5066	60	15	0	2909	34	472	6	8462	32
Daggets Creek	2906	87	4	0	147	4	272	8	3329	13
Dale Swamp	1299	38	30	1	1540	45	517	15	3386	13
Lake Butte Des Morts	1037	75	24	2	174	13	145	11	1380	5
Lower Rat River	1476	73	0	0	52	3	503	25	2031	8
Upper Rat River	3262	56	50	1	1733	30	827	14	5872	22
Winneconne-Poygan	1152	70	144	9	29	2	323	20	1648	6
Watershed Totals	16198	62%	267	1%	6584	25%	3059	12%	26108	100%

Subwatershed	Sediment Control Planned: Cropland (tons)	%	Sediment Control Planned: Banks (tons)	%	Sediment Control Planned: Gullies (tons)	%	Total Sediment Subwatershed Control Planned (tons)	%
Arrowhead River	3037	36	7	0	2182	26	5226	62
Daggets Creek	1714	51	3	0	110	3	1827	55
Dale Swamp	610	18	11	0	1155	34	1776	52
Lake Butte Des Morts	438	32	18	1	131	9	587	43
Lower Rat River	708	35	0	0	39	2	747	37
Upper Rat River	1195	20	1	0	1300	22	2496	42
Winneconne-Poygan	238	14	108	7	22	1	368	22
Watershed Totals	7940	30%	147	1%	4938	19%	13025	50%

(1) Includes streambanks and shorelines
(2) Includes all developed areas, woodlots, wetlands, and grasslands

Delivery Management Target Category	Eligibility Criteria Sediment Delivery (tons/ac/yr)	Sediment Design (tons/ac/yr)
I	>= 0.41	.20
II	>0.20 & <0.41	.20
III	under 0.20	N/A

Figure 1

Croplands and Other Upland Sediment Sources

Sediment eroding from cropped fields is the largest source of phosphorus in the watershed, accounting for over 62% of the total phosphorus load. It is estimated that each ton of sediment delivered contributes approximately 1.24 pounds of phosphorus. Therefore, in order to reach both the sediment reduction and phosphorus reduction objectives of the project, it is necessary to target a large amount of sediment reduction for control. The design target for eroding fields will be to control sediment delivery to surface water to a rate of .20 tons per acre per year or less. Landowners controlling upland sediment sources will be eligible for nutrient management plan development cost-share assistance.

Control of sediment to the level described will result in a decrease of 7,940 tons of sediment, and an associated 9,846 pounds of phosphorus, from agricultural fields.

There are two ways that a participating landowner can meet the upland sediment control requirements as defined in the above box:

1. The installation of Best Management Practices (BMPs) on all Management Category I fields to meet the design target. (Management Category II fields are also eligible for cost-shared BMPs although it is not required).

2. In meeting the upland sediment control requirements for a landowner, the county may wish to use a "whole farm approach". Under this system, the amount of sediment that is controlled through meeting the Management Category I criteria listed in the box above is calculated for a landowner. This "farm target number" must then be met through any combination of sediment control measures applied to any of the eligible lands on the farm.

Either of these alternatives may be used throughout the watershed depending on which system best suits the needs of a participating landowner.

The number of acres eligible for funding of control practices, the tons of sediment controlled, and the percent reduction for each management category is shown in table 4-3.

Animal Lot Runoff

Barnyard eligibility is based on the management objectives determined from the water resources appraisal report. The management category criteria is described below. Where an animal lot does not meet either Management Category I or II criteria, every effort will be made to provide assistance through other programs such as ACP.

Management Category I

All barnyards were ranked in descending order of phosphorus contribution based on inventory results. Management Category I barnyards are those largest phosphorus contributors most critical to control in order to achieve the water resource objective for phosphorus reduction. Category I barnyards are yards contributing 50 pounds or more of phosphorus annually. The design target for all Category I barnyards shall be to control to 15 pounds of phosphorus or less on an annual basis.

All Category I project participants who are installing any type of barnyard system are required to use SCS 590 Appendix B criteria to define suitable acres for spreading during winter months. Landowners installing barnyard systems are eligible for nutrient management cost-share assistance if they choose to develop a nutrient management plan.

Management Category II

Management Category II will consist of any barnyard contributing greater than or equal to 30, and less than 50, pounds of phosphorus annually. The design target for all Category II barnyards shall be to control to 15 pounds of phosphorus or less on an annual basis.

All Category II project participants who are installing barnyard systems are also required to use SCS 590 Appendix B criteria to define suitable acres for spreading during winter months. Landowners who are installing barnyard systems are eligible for nutrient management cost-share assistance if they choose to develop a nutrient management plan.

Internally Drained Animal Lots

Eligibility for internally drained animal lots will be based on the same phosphorus loading and design target criteria as lots that drain to surface waters. Based on this criteria, it is estimated that nine animal lots meet Category I criteria, four animal lots meet Category II criteria, and seventeen lots would be considered Category III.

Table 4-3. Rural Uplands Targeted for Sediment Control								
Subwatershed	Total Upland Sediment (tons/yr)	Management Category I			Management Category II			Mgt. Cat. III (acres)
		Acres	Control (tons/yr)	Control %	Acres	Control (tons/yr)	Control %	
Arrowhead River	5538	6702	3037	54.8	1331	214	3.9	11316
Daggets Creek	3178	3490	1714	53.9	1193	194	6.1	2696
Dale Swamp	1816	1184	610	33.6	1015	94	5.2	10605
Lake Butte Des Morts	1182	1079	438	37.1	792	144	12.2	2093
Lower Rat River	1979	1876	708	35.8	740	87	4.4	11404
Upper Rat River	4089	2248	1195	29.2	2690	272	6.7	12907
Winneconne-Poygan	1475	766	238	16.1	2013	293	19.9	6024
Watershed Totals	19257	17345	7940	41.2%	9774	1298	6.7%	57045

Table 4-4. Barnyards Targeted for Runoff Control								
Subwatershed	Total Phos. (lbs.)	Management Category I			Management Category II			Mgt. Cat. III (yards)
		Yards (#)	Control (lbs.)	Control (%)	Yards (#)	Control (lbs.)	Control (%)	
Arrowhead River	1140	5	601	52.7	8	205	18.0	17
Daggets Creek	327	2	133	40.7	2	54	16.5	10
Dale Swamp	606	7	474	78.2	0	0	0.0	23
Lake Butte Des Morts	197	1	64	32.5	1	23	11.7	4
Lower Rat River	496	1	63	12.7	10	218	44.0	14
Upper Rat River	790	8	490	62.0	2	55	7.0	35
Winneconne-Poygan	123	1	53	43.1	0	0	0.0	5
Watershed Totals	3679	25	1878	51.0%	23	555	15.1%	108

Table 4-5. Streambank and Shoreline Sites Targeted for Sediment Control Management Category I								
Subwatershed	Length of Degraded Sites (ft.)**	Sediment Degraded Sites (tons)	Length of Degraded Agri. Sites (ft.)	Sediment Loading Agri. Sites (tons)	Estimated Agri. Sites Controlled (tons)	Length of Degraded Shoreline (ft.)	Sediment Loading Shoreline (tons)	Estimated Shoreline Controlled (tons)
Arrowhead River	595	15	370	9	7	0	0	0
Daggets Creek	255	4	255	4	3	0	0	0
Dale Swamp	3478	30	1025	14	11	0	0	0
Lake Butte Des Morts	750	24	300	16	12	450	8	6
Lower Rat River	0	0	0	0	0	0	0	0
Upper Rat River	5128	50	1387	1	1	0	0	0
Winneconne-Poygan	5065	144	0	0	0	5065	144	108
Watershed Totals	15271	267	3337	44	33	5515	152	114

* All sites not included in Category I are considered to be Category II.
** eroded, trampled, or slumped

Where county project managers are uncertain as to the potential for impact to groundwater caused by an internally drained lot, field investigations may be conducted jointly by the county project management staff, water resource management investigators from the DNR's Lake Michigan District Office, and staff from the DATCP. Department and county file data and/or a site visit will be used for the investigation. Information to be used may include, but is not limited to, the following: a mechanical analysis of the soil, site-specific determination of depth to bedrock or groundwater, herd size, barnyard management, location of the barnyard with respect to groundwater recharge areas, and groundwater quality information. The DNR, the DATCP, and the county project management staff will then make a joint determination of the appropriate management category.

The number of barnyards, and the amount of phosphorus targeted for control is shown on table 4-4. This table contains only those lots impacting surface waters.

Winter Spread Manure Runoff

Some landowners will be eligible for cost-share assistance for manure storage facilities and nutrient management plan development. It is estimated that phosphorus loading from barnyards contributes 58% of the total loading from animal waste while improperly applied manure and leaching from unconfined manure stacks accounts for the remaining 42%. Using these figures, winter spread manure and stacking contribute an estimated 2664 pounds of phosphorus annually to the surface waters of the watershed.

SCS 590 Appendix B criteria will be used to determine the need for, and appropriateness of, short term stacking or manure storage needs. Having determined suitable acres using Appendix B criteria, the landowners actual rotation will then be used to estimate the number of acres that may be available for spreading in a given year. Actual herd size at the time of landowner contact will be used to estimate the amount of phosphorus produced during 180 days. If the landowner does not have enough suitable acreage to safely spread the 180 day quantity at the rate of 100 pounds phosphorus per acre according to SCS 590 guidelines, taking rotation into account, the landowner will be eligible for manure storage cost-share assistance. If manure storage is cost-shared through the watershed program, a SCS 590 nutrient management plan must be developed. Soil testing, residual nitrate testing, and manure analysis if necessary will be eligible for cost-share assistance when developing the SCS 590 plan.

Management Category I

A preliminary inventory using the criteria above was conducted to estimate the number of landowners who potentially need manure storage to eliminate a water quality threat. Category I will consist of enough landowners to achieve a 51% reduction in the estimated phosphorus loading from winter spread manure. Based on the inventory, landowners who are short by 10 or more suitable acres for safely spreading 180 days of manure produced will be considered Category I. There are an estimated 12 landowners who may meet this criteria.

Management Category II

All other landowners who are lacking suitable acreage based on the criteria above will be considered Category II. There are an estimated 17 landowners who may meet this criteria.

Streambank and Shoreline Erosion

Streambank and shoreline erosion control measures and cattle access restrictions are eligible for cost-share funding throughout the watershed where there is active streambank or shoreline erosion and/or unrestricted livestock access to a stream. These measures are required of participating landowners if Category I criteria are applicable. These measures are eligible, but not required, where Category II criteria apply.

Where streambank erosion sites are to be controlled through a cost-share agreement, and cattle have access to the stream, cattle access must be restricted through fencing or limited grazing. Limited term or rotational grazing is an eligible best management practice throughout the watershed project area where cattle have access to streams, and streambank erosion is present. County LCD staff will develop limited term grazing program requirements based on guidelines contained in SCS technical guide 510. Livestock numbers recommended in the guide may be reduced as necessary to achieve management objectives. Lands with bank heights greater than six feet may be exempt from this requirement if cattle access is not contributing to the streambank erosion problems.

Table 4-5 shows the estimated length and tons of sediment from degraded sites, and the tons of sediment to be controlled. Management category criteria are listed below.

Management Category I

1. All landowners participating in the watershed project who have streambank or shoreline erosion on their property will be required to control at least 75% of the sediment loading of streambank sites adjacent to agricultural lands (cropped fields, pastured lands, and livestock access areas), and 75% of the sediment loading from shoreline erosion. Any combination of structural shoreline or streambank controls, fencing, and grazing management techniques may be used to achieve the required level of control.

2. Streambank and shoreline sites selected for control for any given landowner shall be determined so as to first control those sites contributing the largest sediment load and affecting the greatest length.

3. Fencing to restrict livestock access to streambanks shall be required where holding areas are in close proximity to the streambank.

Management Category II

All streambank and shoreline sites in the watershed project not included in Category I requirements will be considered Category II sites and shall be eligible for funding. Landowners shall control at least 75% of the sediment loading from sites on their property.

Gully Erosion Control

Gully erosion control measures are eligible for cost-share funding throughout the watershed if the gully is determined to be contributing sediment to surface waters. These measures are required of participating landowners if Category I criteria are applicable. These measures are eligible, but not required, where Category II criteria apply.

Management Category	Criteria
I	Participating landowners will be required to control at least 75% of the sediment generated from the gullies on their property as determined by a site visit.
II	All remaining gullies not required by Category I.

Figure 2

Estimates prepared by LCD staff indicate that 100% of the gullies in the watershed could be controlled through low and medium cost management practices. The intent of the gully control requirement is to eliminate gullies because of their potential to contribute even larger sediment loads in the future if allowed to continue forming. Therefore, the sediment load reduction estimates that will be calculated as a part of Chapter 7 requirements will in fact be minimum estimates based on current gully size.

Nutrient and Pesticide Infiltration

Well sampling results indicate that current fertilizer and pesticide applications and management are having some negative impact on groundwater quality. The physical characteristics of the watershed (topography, soils, and bedrock) may not be suitable for current land use intensity.

Proper nutrient management will assist in achieving the phosphorus reduction objective as well as reduce the possibility of groundwater contamination. Several information and

education activities are directed towards nutrient management. Also, the upland sediment, animal lot, and winter spread manure management criteria makes participating landowners eligible for cost-share assistance when developing SCS 590 nutrient management plans. Pesticide management consistent with the SCS 595 pest management standard is also an available best management practice. Implementation of SCS 590 and 595 management plans will directly reduce the amount of nutrients and pesticides carried in runoff to surface waters.

In order to be eligible to receive cost-share assistance for nutrient or pesticide management, a landowner must already be eligible to receive assistance (Management Category I or II), based on criteria outlined in this chapter to control nonpoint pollution from either barnyard runoff, winter spread manure, or eroding croplands or uplands. Cost-share assistance will be available for soil testing, residual nitrate testing, manure analysis if necessary, crop scouting, or complete integrated crop management systems according to nonpoint source program guidance 92-1.

Animal Waste Storage Ordinance

Outagamie and Winnebago Counties are required to maintain existing animal waste storage ordinances which meet requirements outlined by DATCP in Chapter 92.16 Wisconsin Statutes. These ordinances are required for grant eligibility.

Easements

Criteria for Eligibility of Easements

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

- shoreline buffers,
- critical area stabilization,
- wetland restoration.

NOTE: In addition to the criterium described below, the landowners must control all "Management Category I" sources (through a cost-share agreement, easement, or a combination thereof) to be eligible for an easement through the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project.

Easements to Support Critical Area Stabilization and Shoreline Buffers

The following guidelines and criteria are for the purchase of easements used to support critical area stabilization, and shoreline buffers, exclusive of wetland restoration. Guidelines for using easements to support wetland restoration are presented later in this chapter.

1. Riparian lands along "high priority" water resources: These are the highest priority areas for obtaining easements to support critical area stabilization and shoreline buffer practices and include those streams that are most sensitive to nonpoint pollution. These water resources will experience added benefits of permanent vegetative cover, enhancements to aquatic habitat, and, if agreed to by the landowner, improved public access to surface waters.

   In this watershed "high priority" waters are the perennial main channels of the Arrowhead River, Rat River, and Daggets Creek. Easement acquisition along these streams would aid greatly in achieving water resource objectives.

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

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

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

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

Easements to Support Wetland Restoration

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

If wetland restoration does not involve the purchase of an easement, then the LCD may sign a cost-share agreement for the required costs and proceed to implement the practice. Further discussion on the Wetland Restoration Practice is given below.

Administration of Easements

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

Easements may be contracts between the land owner and the Department of Natural Resources, or between the land owner and the local unit of government. The local unit of government will retain responsibility for identifying how the easement will be used in controlling targeted pollution sources. Final approval of the easement rests with the DNR's Bureau of Water Resources Management.

To initiate the process, the local unit of government shall forward the easement proposal to the DNR District Nonpoint Source Coordinator. The Nonpoint Source Coordinator will be responsible for obtaining review comments from local DNR staff including those from Wildlife Management, Fish Management, and Water Regulation and Zoning. The Nonpoint Source Coordinator will then forward the proposal to DNR bureau offices for Water Resources Management, Property Management, and other disciplines as appropriate.

Estimated Need for Easements

The estimated number of acres needed to control targeted pollution sources located adjacent to "high priority waters" is shown in table 5-3. No estimate is available for other easement needs.

Criteria for Eligibility of Wetlands Restoration

Wetland restoration is an eligible best management practice for the purpose of controlling nonpoint sources of pollution. Secondary benefits of wetland restoration may be enhancement of fish and wildlife habitat. However, the primary justification for restoration under this nonpoint source pollution control project must be water quality improvement.

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

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

- Cultivated organic soils with tile or open channel drainage systems discharging to a stream or tributary.

  Wetland restoration will reduce the amount of nutrients and pesticides draining from the altered wetland to a water resource. Establishing permanent vegetation and disabling the drainage system will control this pollutant source.

- Pastured wetlands riparian to streams, or tributaries.

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

- Prior converted wetlands down slope or up slope from fields identified as critical upland sediment sources through the WIN model.

  Restoration of wetlands in these situations will do one of two things: 1) create a wetland filter which reduces the pollutants from an up slope field(s) to a water resource; or 2) reduce the volume and/or velocity of water flowing from an up slope wetland to a down slope critical field.

  Two eligibility conditions must be met to use wetland restoration in this situation:

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

  b) One or more of these same fields must still have a sediment loss rate (after the application of any erosion control measures) greater than the 0.2 tons/acre/year sediment delivery rate used for upland erosion eligibility.

Drainage Ditches

Maintenance of drainage ditches is a regulated activity under the Department of Natural Resources, Bureau of Water Regulation and Zoning. Landowners who plan to perform maintenance activities on their ditches are required to obtain a permit from the DNR District Water Regulation and Zoning specialist prior to conducting such actions. The permits issued for ditch maintenance require the landowner to meet special conditions associated with individual sites. These special conditions will allow conducting the activity in a way that will minimize its effect on water quality.

In addition, the Department of Agriculture, Trade, and Consumer Protection is responsible for administering the drainage districts program. Recent legislation has further directed the

DATCP to develop performance standards for drainage districts which provide for water quality protection. These performance standards will be applicable within the Arrowhead River, Rat River and Daggets Creek watershed when developed.

As stated in NR 120.10(2)(n), dredging of harbors, lakes, and ditches is *not eligible* for cost-share assistance.

Urban Nonpoint Source Management Actions

Construction Site Erosion Control

While the existing nonpoint pollution sources are always a concern, another aspect of concern are the lands that will be developed over the next 10-30 years. A major pollution concern is uncontrolled construction site erosion. It is essential that controls be enacted to reduce the sediment erosion from these sites. Studies have shown that up to 30 tons/per acre of sediment can be washed off these sites. In terms of urban sediment loading, construction site erosion is the largest contributor to overall sediment loadings.

Outagamie and Winnebago counties are required to enact and enforce construction erosion control programs. These programs will be locally developed and administered. Each program requires a comprehensive ordinance, a set of practice standards and application guidelines, an effective administrative program, and effective enforcement. In areas that are already developed, a program is still needed to control erosion from renewal projects and work on buried utilities. In addition, training programs are needed for staff that must administer the ordinances and the building industry who must comply with ordinance requirements.

Ordinances must meet the applicability requirements of NR 120.16. Ordinances must also meet the content requirements in NR 120.16 that deal with erosion control.

The DNR and the League of Wisconsin Municipalities cooperatively developed the "Model Construction Site Erosion Control Ordinance" and suggested changes to the model ordinance that James H. Schneider, League Legal Counsel, set forth in the March 1989 issue of "The Municipality". This model ordinance will be used as a guide to determine the adequacy of ordinances. Erosion control practice standards and applicability criteria should be consistent with those set forth in the publication *Wisconsin Construction Site Best Management Practice Handbook* (DNR, 1989).

Established and Developing Urban Areas

The Village of Winneconne, and the unincorporated developed areas throughout the watershed, may be eligible for cost-share assistance to install nonpoint source control

practices. Funds for practices installed in the unincorporated developed areas would be administered through grants with Outagamie and Winnebago counties.

A detailed inventory of pollutant loading from developed areas was not conducted in this watershed. However, where governmental units are interested in modifying existing stormwater runoff situations, cost-share and technical assistance may be available through the priority watershed program. DNR nonpoint staff are available to assist the village and counties in reviewing existing situations and recommending a course of action. Feasibility studies would be necessary to select site specific practices. The cost and complexity of studies will vary, depending on the availability of land for locating practices, and the compatibility of existing stormwater drainage or storm sewer networks.

It is especially important that the Village of Winneconne, and Outagamie and Winnebago counties, consider the types of practices described below when areas are being developed or planned for future development. The cost of many practices will be considerably cheaper if planned and installed as part of the original development of an area.

Urban Best Management Practices

There are four general classes of management practices used to reduce water quality problems that urban stormwater flows and the associated pollutant loads cause. These are: streambank erosion control practices; source reduction practices; infiltration practices; and wet detention practices.

Streambank Erosion Control Practices

Streambank and shoreline erosion sites occurring in developed areas shall be eligible for cost-shared control practices on a case by case basis depending on the quantity of sediment being eroded and the cost effectiveness of control practices. Criteria applicable in rural areas shall also apply in the developed areas.

Source Reduction Practices

These practices are meant to curb the generation of urban pollutants as close to the source as possible. Ideally, pollutant generation is stopped. At a minimum, pollutants that are generated are controlled prior to entering surface waters, either directly or via a storm sewer.

Source area controls are generally non-structural in commercial and residential areas, relying instead on changes in products people use and in the way people live. Reducing the amount of automobile traffic in an area, and the current programs that remove lead from gasoline and asbestos from automobile brake linings are also examples of source controls.

Source area controls that rely on better housekeeping practices, such as pet waste control programs and judicious use of lawn and garden products, can be initiated locally. These types of controls are an inexpensive and vital component of any urban stormwater

management program. Information and education efforts are critical in supporting this approach since this type of urban action is only as good as the collective effort made by the general public responsible for carrying it out. Several source control alternatives recommended in this watershed are:

- Remove pet wastes immediately from lawns, sidewalks, and streets so bacteria contamination of urban runoff can be reduced.
- Manage the timing, amount, and type of fertilizer and pesticide applications in urban areas.
- Properly dispose automobile waste fluids, such as radiator water and engine oil, to keep them out of storm sewer systems.
- Remove leaves and street dirt from street and parking lot surfaces through street sweeping and leaf collection programs.
- Base zoning of land use, in part, on site suitability for stormwater management practices needed to meet water quality, habitat, and flood related objectives.
- Strictly limit construction site erosion.
- Keep use of street de-icing compounds to a minimum.

Infiltration Practices

The volume of urban runoff transporting pollutants to surface waters during a rainstorm is directly related to the amount of impervious urban area that is directly connected to the receiving waters. Impervious areas include rooftops, parking lots, streets, and sidewalks. Directly connected areas are those that drain directly to storm sewer pipes or concrete channels.

Reducing pollutant transport to surface waters involves disconnecting the urban stormwater flow. This is accomplished by increasing the infiltration of stormwater into the ground. Stormwater infiltration on a suitable site will effectively reduce all major stormwater pollutants. Infiltration can be used jointly with wet detention where needed to augment the water resources management capabilities of the less versatile wet detention pond.

Practices that promote infiltration include porous pavement, redirecting roof downspouts to grassy areas, directing runoff waters to infiltration trenches, grassed swale drainage systems, and infiltration basins. Not all sites are appropriate for the use of infiltration practices. Slopes, heavy clay soils, and the potential for groundwater contamination may limit the areas available for use of these practices.

Wet Detention Practices

Wet detention ponds are effective at controlling particulate pollutants and can be designed to control peak flow discharges. Consequently, they can be employed to serve many needs including pollution control, flood control, and control of stormwater flows that may be causing streambank erosion. These ponds have limited effectiveness in controlling urban pollutants in the dissolved state, and cannot effectively reduce the total stormwater volume. The wet pond is most commonly used to control runoff coming from large areas.

Wet detention ponds must be lined in areas where potential groundwater contamination from the pond is a concern.

CHAPTER FIVE
Local Government's Implementation Program

Introduction

This chapter identifies the means for implementing the rural and urban management actions for nonpoint source pollution control described in chapter four. It is divided into two major sections. The first describes the county's nonpoint source implementation strategy for rural areas. The second section contains the elements of the villages of Winneconne and Butte des Morts nonpoint source pollution control implementation strategy for the urban and developing portions of the watershed. Included in the implementation program for rural and urban areas is an information and education strategy. The success of this priority watershed project depends on the aggressive implementation of these three nonpoint source control strategies.

More specifically this chapter identifies:

- The agencies and units of government responsible for carrying out identified tasks
- The best management practices (BMPs) necessary to control pollutants on the critical sites identified in chapter four
- The cost-share budget
- The cost containment policies
- The cost-share agreement reimbursement procedures including administrative procedures for carrying out the project
- Staffing needs including total hours per year and number of staff to be hired
- Schedules for implementing the project
- The information and education activities that will be carried out in the project area

- The involvement of other programs

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

Project Participants: Roles and Responsibilities

Landowners and Land Operators

Owners and operators of public and private lands are the most important participants in the priority watershed program. They will adopt BMPs which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources. Land owners and land operators in the Arrowhead River, Rat River and Daggets Creek watershed eligible for cost-share assistance through the priority watershed program include: individuals, Winnebago County and Outagamie County, other governmental units described in NR 120.02(19), corporations, and the State of Wisconsin.

Winnebago and Outagamie counties are the primary units of government responsible for implementing this plan in rural areas.

The Winnebago and Outagamie County Land Conservation Committees (LCC) will act for the respective County Boards, based on the powers delegated by the County Board to the LCC per Chapter 92.07(1) Wisconsin Statutes. Each county will be responsible contractually and financially to the State of Wisconsin for management of the project in areas with rural land uses. The County LCCs will coordinate the activities of all other local agencies involved with the rural portion of the project.

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

- Identify in writing the person(s) who will represent each county during implementation of the project.

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

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

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

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

- Design best management practices and verify proper practice installation.

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

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

- Prepare and submit to the Department of Natural Resources (DNR) and the Department of Agriculture, Trade and Consumer Protection (DATCP) the annual resource management report required under s. NR 120.21(7) to monitor project implementation by tracking changes in the nonpoint source inventory, and quantifying pollutant load reductions which result from installing BMPs.

Department of Natural Resources

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

Project Administration

Project administration includes working with the counties to ensure that work commitments required during the 8-year project implementation phase can be met. The DNR will participate in the annual work planning process with the county.

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

Financial Support

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

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

Project Evaluation

The DNR has responsibility for priority watershed project monitoring and evaluation activities. These efforts determine if changes in water quality occur as best management practices and other pollution controls are installed or implemented. The water quality evaluation and monitoring strategy for the Arrowhead River, Rat River and Daggets Creek watershed are included in chapter eight. The DNR documents the results of monitoring and evaluation activities in interim and final priority watershed project reports.

Technical Assistance

The DNR provides technical assistance to the county on the design and application of best management practices. This assistance is primarily for urban areas.

Other Responsibilities

- The appropriate District Nonpoint Source Coordinator to arrange for DNR staff to assist county staff with site reviews to determine the impacts of nonpoint sources on wetlands and/or groundwater quality.

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

Department of Agriculture, Trade and Consumer Protection

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

- Manage a training program for the staff involved with project implementation

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

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

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

- Assist counties to develop a manure storage ordinance

- Assist county staff to complete annual workload analyses and grant applications for work conducted under the priority watershed project
- Participate in the annual project review meetings
- Assist in developing technical standards for agricultural BMPs, and provide technical assistance to county staff concerning application of these practices
- Assist county staff to evaluate the site specific practicality of implementing rural best management practices

Other Agencies

The Arrowhead River, Rat River and Daggets Creek Priority Watershed Project will receive assistance from the agencies listed below.

Soil Conservation Service (SCS)

This agency works through the local LCC to provide technical assistance for planning and installing conservation practices. SCS personnel will work with the county staff to provide assistance with technical work when requested by the Land Conservation Committee and if SCS staff time is available. The Area SCS office will provide staff training and engineering assistance for best management practices. Efforts will be made by SCS to coordinate the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project with the conservation compliance and other conservation provisions of the 1985 and subsequent Federal Farm Bills.

University of Wisconsin Extension (UWEX)

County and Area Extension agents will provide support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project. This will include assistance to carry out the information and education activities identified in this plan.

Agricultural Stabilization and Conservation Service (ASCS)

ASCS administers most of the federal programs aimed at the stabilization of the prices paid producers for agricultural products and administers federal funds for rural soil and water and other resource conservation activities. The Agricultural Conservation Program (ACP) administered by ASCS will, to the extent possible, be coordinated with the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project. In addition, other conservation programs such as the Conservation Reserve Program (CRP) will be used whenever possible to help meet the objectives of nonpoint source pollution control identified in this plan.

Agricultural Best Management Practices (BMPs)

BMPs Eligible For Cost-Sharing And Their Rates

Best management practices are those practices, identified in NR 120 and in this watershed plan, that are believed to be the most effective controls of the nonpoint sources of pollution. The practices eligible for cost-sharing under the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project are listed in table 5-1. The cost-share rates for each BMP are in the table below.

Design and installation of all BMPs must meet the conditions listed in NR 120. Generally these practices use specific standard specifications included in the SCS Field Office Technical Guide. In some cases additional specifications may apply. The applicable specifications for each BMP can be found in NR 120.14. The DNR may approve alternative best management practices and alternative design criteria based on the provisions of NR 120.15 where necessary to meet the water resource objectives.

If the installation of BMPs destroys significant wildlife habitat, NR 120 requires that habitat will be recreated to replace the habitat lost. The DNR District Private Lands Wildlife Specialist or a designee will assist the LCDs in determining the significance of wildlife habitat and the methods used to recreate the habitat. Every effort shall be taken during the planning, design, and installation of BMPs to prevent or minimize the loss of existing wildlife habitat.

Following is a brief description of some of the most commonly used cost-shared BMPs included in table 5-1. A more detailed description of these practices can be found in NR 120.14.

Commonly Used Cost-Shared BMPs

Contour Farming - The farming of sloped land so that all operations from seed bed preparation to harvest are done on the contour.

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

Reduced Tillage - A system which leaves a roughened surface and at least 30% crop residue on the soil surface after crops are planted. The system consists of no more then one primary tillage pass in the fall or spring and no more than two passes with light or secondary tillage equipment prior to planting. It is utilized in two situations; one for continuous row crops or long corn rotations, the other for short crop rotations or for the establishment of forages and small grains.

Critical Area Stabilization - The planting of suitable vegetation on critical nonpoint source sites and other treatment necessary to stabilize a specific location.

Table 5-1. State Cost-Share Rates for Best Management Practices	
BEST MANAGEMENT PRACTICE	**STATE Cost-share RATE**
Contour Farming	50%[1]
Contour Strip Cropping	50%[1]
Field Strip Cropping	50%[1]
Field Diversions and Terraces	70%
Grassed Waterways	70%
Reduced Tillage	50%
Critical Area Stabilization	70%[2]
Grade Stabilization Structures	70%
Agricultural Sediment Basins	70%
Shoreline and Streambank Stabilization	70%
Shoreline Buffers	70%[2]
Barnyard Runoff Management	70%
Animal Lot Relocation	70%
Manure Storage Facilities	70%[3]
Livestock Exclusion from Woodlots	50%
Wetland Restoration	70%[2]
Roofs for Barnyard Runoff Management and Manure Storage Facilities	70%
Nutrient and Pesticide Management	50%[4]

1. Flat rates for these BMPs can be found in table 5-2. Wildlife habitat restoration components of this practice are cost-shared at 70%.
2. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs. See Chapter four for where easements may apply.
3. Maximum cost-share amount is $20,000 including no more than $5,000 for manure transfer equipment.
4. Spill control basins have a state cost-share rate of 70%.

Table 5-2. Practices Using a Flat Rate for State Cost-Share Funding	
BEST MANAGEMENT PRACTICE	FLAT RATE
Contour Farming	$6.00/ac.
Strip Cropping	$12.00/ac.
Field Strip Cropping	$10.00/ac.
Reduced Tillage	$15.00/ac.[1]
Reduced Tillage	$45.00/ac.[2]

1. Reduced tillage systems for short crop rotations, and establishment of forages and small grains (includes no-till). One year only.
2. Reduced tillage systems for continuous row cropping or long rotations over three years (excluding no-till).

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

Grade Stabilization Structure - A structure used to reduce the grade in a channel to protect the channel from erosion or to prevent the formation or advance of gullies.

Livestock Exclusion from Woodlots - The exclusion of livestock from woodlots to protect the woodlots from grazing by fencing or other means.

Shoreline and Streambank Stabilization - The stabilization and protection of stream and lake banks against erosion and the protection of fish habitat and water quality from livestock access. This practice includes rock rip-rap, shaping and seeding, streambank fencing and fish habitat structures. This practice may include pasture pumps for watering livestock excluded from water bodies.

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

Field Diversions - This purpose of this practice is primarily to divert water away from areas it is in excess, or is doing damage, to where it can be transported safely.

Barnyard Runoff Management - Structural measures such as filter systems and/or diversions to redirect surface runoff around the barnyard, and collect, convey or temporarily store runoff from the barnyard.

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

Agricultural Sediment Basins - A structure designed to reduce the transport of sediment eroded from critical agricultural fields, and other pollutants, to surface waters and wetlands.

Shoreline Buffers - A permanently vegetated area immediately adjacent to lakes, streams, channels, and wetlands designed and constructed to manage critical nonpoint sources or to filter pollutants from nonpoint sources.

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

Wetland Restoration - The construction of low head dikes or shallow excavation areas, or the plugging of tile lines or drainage ditches to create conditions suitable for wetland vegetation.

Roofs for Barnyard Runoff Management and Manure Storage Facilities - Construction of roofs to prevent rain and snow from contacting manure.

Nutrient Management - The management and crediting of nutrients for the application of manure and commercial fertilizers, and crediting for nutrients from legumes. Management includes the rate, method, and timing of the application of all sources of nutrients to minimize the amount of nutrients entering surface or groundwater.

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

BMPs Not Cost-Shared

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

- That portion of a practice to be funded through other programs.
- Practices previously installed and necessary to support cost-shared practices.
- Changes in crop rotations and other activities normally and routinely used in growing crops or that have installation costs that can be passed on to potential consumers.

- Changes in location of unconfined manure stacks involving no capital cost.
- Manure spreading equipment, labor, and contracts.
- Other activities the DNR determines are not necessary to achieve the objectives of the watershed project.

Activities and Sources Of Pollution Not Eligible For Cost-share Assistance

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

- Operation and maintenance of cost-shared BMPs
- Actions which have drainage of land or clearing of land as the primary objective
- Practices already installed
- Activities covered under the Wisconsin Pollution Discharge Elimination System (WPDES) Program or covered in other ways by Chapter 147 of Wis. Stats. (including livestock operations with more than 1,000 animal units, or livestock operations issued a notice of discharge under ch. NR 243),
- Septic system controls or maintenance
- Dredging activities
- Silvicultural activities
- Bulk storage of fertilizers and pesticides
- Activities and structures intended primarily for flood control
- Practices required to control sources which were adequately controlled at the time the cost-share agreement was signed
- Other practices or activities determined by DNR not to meet the objectives of the program.

Cost-Share Budget

Costs of Installing BMPs

The quantity and type of management practices that are required to meet this project's water quality objectives are listed in tables 5-3, 5-3a and 5-3b. The capital cost of installing the BMPs are listed in these tables assuming landowner participation rates of 100% and 75%. Also included are the units of measurement and cost-share amount per unit for the various BMPs.

The capital cost of installing the Best Management Practices in Winnebago and Outagamie counties is approximately $1.92 million and $0.88 million, respectively, assuming 100% participation.

- State funds necessary to cost-share this level of control would be about $1.46 million and $0.62 million for Winnebago and Outagamie counties, respectively.

- The local share provided by landowners and other cost-share recipients would be about $0.46 million and $0.26 million, respectively.

At a 75% level of participation, the state funds needed to cover capital installation would be about $1.10 million and $0.47 million for Winnebago and Outagamie counties, respectively.

Easement Costs

Chapter four identifies where nonpoint source program funds can be used to purchase easements. The estimated cost for purchasing easements on eligible lands in Winnebago and Outagamie counties is shown in table 5-3 through 5-3b. At 100% participation, the estimated purchase price of easements on eligible lands would be $1,200 and $400 in Winnebago and Outagamie counties, respectively. At 75% participation, the cost would be $900 and $300; respectively. The easement costs would be paid for entirely by the state.

Table 5-3. Cost-Share Budget Needs for Rural Management Practices in the Arrowhead River, Rat River, Daggets Creek Watershed

Best Management Practices	Number	Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
				State Share	Local Share	State Share	Local Share
Upland NPS Control							
Change in Crop Rotation	3,791 ac	NA (3)	0	0	0	0	0
Contour Cropping	9,118 ac	$6	54,708	54,708	(2)	41,031	(2)
Contour Strip Cropping	879 ac	$12	10,548	10,548	(2)	7,911	(2)
Reduced Tillage (4)	7,591 ac	$45	341,595	341,595	(2)	256,196	(2)
Critical Area Stabilization	20 ac	$275	5,500	3,850	1,650	2,888	1,238
Grass Waterways	49 ac	$1,175	57,575	40,303	17,273	30,227	12,954
Field Diversions & Terraces	5,500 ft	$3	15,125	10,588	4,538	7,941	3,403
Grade Stabilization	22 ea	$3,000	66,000	46,200	19,800	34,650	14,850
Agricultural Sediment Basin	23 ea	$3,000	69,000	48,300	20,700	36,225	15,525
Woodlot Fencing	350 rd	$10	3,500	2,450	1,050	1,838	788
Shoreline Buffers	325 ac	$250	81,250	56,875	24,375	42,656	18,281
Wetland Restoration	54 ea	$500	27,000	18,900	8,100	14,175	6,075
Animal Waste Management							
Barnyard Runoff Control							
Complete System	47 ea	$22,500	1,057,500	740,250	317,250	555,188	237,938
Clean Water Diversion	49 ea	$4,000	196,000	137,200	58,800	102,900	44,100
Manure Storage Facility (6)	29 ea	$25,000	725,000	507,500	217,500	380,625	163,125
Manure Spreading Management	25,500 ac	NA	0	0	0	0	0
Streambank Erosion Control							
Pasture Management	140 ac	NA	0	0	0	0	0
Shape and Seeding	1,072 ft	$3	3,216	2,251	965	1,688	724
Fencing	136 rd	$10	1,360	952	408	714	306
Rip-Rap	6,201 ft	$12	74,412	52,088	22,324	39,066	16,743
Livestock/Machinery							
Crossing/Watering Ramp	10 ea	$1,150	11,500	8,050	3,450	6,038	2,588
Subtotal:			$2,800,789	$2,082,608	$718,181	$1,561,956	$538,636
Easements	4 ac	$400	$1,600	1,600	0	1,200	0
Totals			$2,802,389	$2,084,208	$718,181	$1,563,156	$538,636

[1] Total cost to control identified critical pollution sources
[2] NA means that cost-share funds are not available for this practice
[3] Local share consists of labor and any additional equipment costs, also see flat rates
[4] Reduced tillage on greater than three years continuous row crops
[5] Reduced tillage, including no-till, on rotations including hay
[6] Maximum cost-share is $20,000

Source: WI Department of Natural Resources; WI Department of Agriculture, Trade and Consumer Protection; and the Land Conservation Department of Winnebago and Outagamie County

Table 5-3a. Cost-Share Budget Needs for Rural Management Practices in the Winnebago County

Best Management Practices	Number		Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
					State Share	Local Share	State Share	Local Share
Upland NPS Control								
Change in Crop Rotation	2,994	ac	NA (3)	0	0	0	0	0
Contour Cropping	8,348	ac	$6	50,088	50,088	(2)	37,566	(2)
Contour Strip Cropping	181	ac	$12	2,172	2,172	(2)	1,629	(2)
Reduced Tillage (4)	7,538	ac	$45	339,210	339,210	(2)	254,408	(2)
Critical Area Stabilization	10	ac	$275	2,750	1,925	825	1,444	619
Grass Waterways	36	ac	$1,175	42,300	29,610	12,690	22,208	9,518
Field Diversions & Terraces	4,000	ft	$3	11,000	7,700	3,300	5,775	2,475
Grade Stabilization	15	ea	$3,000	45,000	31,500	13,500	23,625	10,125
Agricultural Sediment Basin	15	ea	$3,000	45,000	31,500	13,500	23,625	10,125
Woodlot Fencing	200	rod	$10	2,000	1,400	600	1,050	450
Shoreline Buffers	265	ac	$250	66,250	46,375	19,875	34,781	14,906
Wetland Restoration	40	ea	$500	20,000	14,000	6,000	10,500	4,500
Animal Waste Management								
Barnyard Runoff Control								
Complete System	31	ea	$22,500	697,500	488,250	209,250	366,188	156,938
Clean Water Diversion	30	ea	$4,000	120,000	84,000	36,000	63,000	27,000
Manure Storage Facility (6)	16	ea	$25,000	400,000	280,000	120,000	210,000	90,000
Manure Spreading Management	14,500	ac	NA	0	0	0	0	0
Streambank Erosion Control								
Pasture Management	40	ac	NA	0	0	0	0	0
Shape and Seeding	830	ft	$3	2,490	1,743	747	1,307	560
Fencing	5	rods	$10	50	35	15	26	11
Rip-Rap	5,641	ft	$12	67,692	47,384	20,308	35,538	15,231
Livestock/Machinery								
Crossing/Watering Ramp	5	ea	$1,150	5,750	4,025	1,725	3,019	1,294
Subtotal:				$1,919,252	$1,460,917	$458,335	$1,095,688	$343,751
Easements	3	ac	$400	$1,200	1,200	0	900	0
Totals				$1,920,452	$2,462,117	$458,335	$1,096,588	$343,751

[1] Total cost to control identified critical pollution sources
[2] NA means that cost-share funds are not available for this practice
[3] Local share consists of labor and any additional equipment costs, also see flat rates
[4] Reduced tillage on greater than three years continuous row crops
[5] Reduced tillage, including no-till, on rotations including hay
[6] Maximum cost-share is $20,000

Source: WI Department of Natural Resources; WI Department of Agriculture, Trade and Consumer Protection; and the Land Conservation Department of Winnebago and Outagamie County

Table 5-3b. Cost-Share Budget Needs for Rural Management Practices in the Outagamie County

Best Management Practices	Number		Cost/Unit	Total Cost[1]	100% Participation		75% Participation	
					State Share	Local Share	State Share	Local Share
Upland NPS Control								
Change in Crop Rotation	797	ac	NA (3)	0	0	0	0	0
Contour Cropping	770	ac	$6	4,620	4,620	(2)	3,465	(2)
Contour Strip Cropping	698	ac	$12	8,376	8,376	(2)	6,282	(2)
Reduced Tillage (4)	53	ac	$45	2,385	2,385	(2)	1,789	(2)
Critical Area Stabilization	10	ac	$275	2,750	1,925	825	1,444	619
Grass Waterways	13	ac	$1,175	15,275	10,693	4,583	8,019	3,437
Field Diversions & Terraces	1,500	ft	$3	4,125	2,888	1,238	2,166	928
Grade Stabilization	7	ea	$3,000	21,000	14,700	6,300	11,025	4,725
Agricultural Sediment Basin	8	ea	$3,000	24,000	16,800	7,200	12,600	5,400
Woodlot Fencing	150	rod	$10	1,500	1,050	450	788	338
Shoreline Buffers	60	ac	$250	15,000	10,500	4,500	7,875	3,375
Wetland Restoration	14	ea	$500	7,000	4,900	2,100	3,675	1,575
Animal Waste Management								
Barnyard Runoff Control								
Complete System	16	ea	$22,500	360,500	252,000	108,000	189,000	81,000
Clean Water Diversion	19	ea	$4,000	76,000	53,200	22,800	39,900	17,100
Manure Storage Facility (6)	13	ea	$25,000	325,000	227,500	97,500	170,625	73,125
Manure Spreading Management	11,000	ac	NA	0	0	0	0	0
Streambank Erosion Control								
Pasture Management	100	ac	NA	0	0	0	0	0
Shape and Seeding	242	ft	$3	726	508	218	381	163
Fencing	131	rods	$10	1,310	917	393	688	295
Rip-Rap	560	ft	$12	6,720	4,704	2,016	3,528	1,512
Livestock/Machinery								
Crossing/Watering Ramp	5	ea	$1,150	5,750	4,025	1,725	3,019	1,294
Subtotal:				$881,537	$621,690	$259,847	$466,268	$194,885
Easements	1	ac	$400	$400	400	0	300	0
Totals				$881,937	$622,090	$259,847	$466,568	$194,885

[1] Total cost to control identified critical pollution sources
[2] NA means that cost-share funds are not available for this practice
[3] Local share consists of labor and any additional equipment costs, also see flat rates
[4] Reduced tillage on greater than three years continuous row crops
[5] Reduced tillage, including no-till, on rotations including hay
[6] Maximum cost-share is $20,000

Source: WI Department of Natural Resources; WI Department of Agriculture, Trade and Consumer Protection; and the Land Conservation Department of Winnebago and Outagamie County

Cost Containment

Cost Containment Procedures

Chapter NR 120 requires that cost containment procedures be identified in this plan. The cost containment procedures to be used by Winnebago and Outagamie counties are described below.

Cost-share payments will be based on actual installation costs. If actual installation costs exceed the amount of cost-sharing determined by the bidding, range of costs, and average cost methods, the amount paid the grantee may be increased with the approval of the appropriate land conservation committee. Appropriate documentation regarding the need for changes will be submitted to DNR.

Bids

Competitive bids will be required in Winnebago and Outagamie counties for all structural BMPs with estimated total costs, as determined by the project technicians, exceeding $5,000. The bidding process requires the cost-share recipient to receive a minimum of two bids from qualified contractors in lump sum bid. The cost-share recipient must provide copies of the bids to the county prior to initiating construction. In cases where the cost-share recipient provides proof that bids were requested from a minimum of three qualified contractors but only one bid was received, the county will determine if the bid constitutes an appropriate cost for the project. If no bids are received or if the lone bid is not deemed appropriate, Winnebago and Outagamie counties will limit cost sharing based on average costs.

Average Costs

Average costs will be used in Winnebago and Outagamie counties for all structural BMPs with an estimated cost equal to or less than $5,000 and for all non-structural BMPs not using a flat rate, unless the cost-share recipient decides, and the county agrees, to bid the installation of the BMPs.

The average cost list will be reviewed periodically and appropriate changes made. If changes are made the list will be forwarded to the DNR and DATCP for final approval before the changes are used to calculate cost-share agreements and payments.

Flat Rates

BMPs using flat rates are shown in table 5-2. The rates shown are the state's share of the practice installation costs.

Grant and Cost-Share Procedures

Nonpoint Source Grant Agreement and Administration

General Information

The Nonpoint Source Grant Agreement is the means for transmitting funds from the DNR (through the Nonpoint Source Program) to Winnebago and Outagamie counties for use in funding the state's share of cost-share agreements. Cost-share agreements are the means to transmit funds from the counties to the landowners.

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

Fiscal Management Procedures, Reporting Requirements

Counties are required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26.

Cost-share Agreement and Administration

Purpose and Responsibilities

Consistent with s. 144.25, Stats. and NR 120, Wis. Adm. Code, cost-share funding is available to landowners for a percent of the costs of installing BMPs to meet the project objectives. Landowners have three years after formal approval of the watershed plan to enter into cost-share agreements. Practices included on cost-share agreements must be installed within the schedule agreed to on the cost-share agreement. Unless otherwise approved by the Department of Natural Resources, the schedule of installing BMPs will be within 5 years of signing of the cost-share agreement. Practices must be maintained for a minimum of ten years from the date of installing the final practice included in the cost-share agreement.

The cost-share agreement is a legal contract between the landowner and the county. The agreement includes the name and other information about the landowner and grant recipient,

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

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

Local, state, or federal permits may be needed before installing some BMPs. The areas most likely to need permits are drainage ditches, zoned wetlands, and the shoreline areas of lakes and streams. These permits are needed whether the activity is a part of the watershed project or not. Landowners should consult with the U.S. Army Corps of Engineers and the DNR to determine if any permits are required. The landowner is responsible for acquiring the needed permits prior to installation of practices.

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

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

Landowner Contact Strategy

The following procedure will be used to make landowner contacts.

1. During the first three months of the implementation period, all landowners or operators will receive from the counties a mailing explaining the project and how they can become involved.

2. After the initial landowner mailings, LCD project staff will make personal contacts with all landowners starting with those who have existing inventory information that identify critical nonpoint sources of pollution (Management Category I). These contacts will occur within one year of receiving the Nonpoint Source Grant Agreement.

3. Those interested in the project will then be inventoried for cropland sediment delivery, if not already done, to establish Management Category status for cropland sediment delivery.

4. The counties will continue to make contacts with landowners and operators until they either have made a definite decision regarding participation in the program, or have been verified as being in Management Category III for all nonpoint sources.

5. The county will contact, by personal letter, all eligible landowners (as defined in d above) who have not signed cost-share agreements six months prior to the end of the cost-share signup period. The letter will explain the project and how they can become involved as well as to serve notice that only a short time remains to sign a cost-share agreement.

Procedure for Developing a Cost-share Agreement

Eligibility for cost-sharing is verified following a site visit, using the criteria described in chapter four.

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

Using the criteria outlined in chapter four, landowners or operators may have a nutrient management assessment developed for their livestock operations to determine the need for, and eligibility for, manure storage facilities. If manure storage facilities are cost-shared a nutrient management plan is required. The plan will not allow winter-spreading of manure on high hazard acres for landowners receiving cost-sharing for manure storage facilities.

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

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

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

2. Landowner agrees to participate with the watershed project.

3. A farm conservation plan is prepared by the county.

4. The landowner agrees with the plan, a Cost-share Agreement is prepared and both documents are signed by the landowner and the county. The Operating Unit's Wisconsin Data Listing report is run through CAMPS to provide the initial planned pollutant load reduction estimate and to ensure the base of information necessary to run future summary reports is properly entered in CAMPS. A copy of the Cost-share Agreement (CSA) and the Operating Unit's Wisconsin Data Listing report is sent to the DNR Lake Michigan District Nonpoint Source Coordinator. A copy of the CSA is given to the landowner. The CSA will be recorded by the county with the County Register of Deeds.

5. Practices are designed by the county, or their designee, and a copy of the design is provided to the landowner.

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

7. Amendments to the CSA are made if necessary.

8. The county staff oversee practice installation.

9. The county verifies the installation.

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

11. Land Conservation Committees, or their designated representative, and if required, county boards, approve cost-share payments to landowners.

12. Checks are issued by the county to the respective landowners and project ledgers are updated.

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

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

Identifying Wildlife and Fishery Needs

The Winnebago and Outagamie county staffs will consult with DNR's Lake Michigan District and/or Oshkosh Area wildlife management and fisheries management staff to optimize the wildlife and fish management benefits of nonpoint source control BMPs. Specifically, the county staff will contact DNR staff if in the county's opinion: Fence rows, rock piles, wetlands, areas of rare or special plant communities, or other wildlife habitat components will be adversely affected by installation of agricultural BMPs.

The DNR staff will assist county staff by:

- Identifying streambank protection practices that benefit fish and wildlife
- Identifying wildlife habitat components that could be incorporated into vegetative filter strips along streams or in upland areas
- Reviewing placement of, and recommending wildlife habitat components for, agricultural sediment basins to assure that negative impacts on stream fish and aquatic life do not occur
- Providing technical assistance when the installation of BMPs will require the removal of obstructions or other wildlife habitat by proposing measures to minimize impact on wildlife habitat
- Assisting to resolve questions concerning effects of agricultural nonpoint source BMPs on wetlands

Submittal to the Department of Natural Resources

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

- where cost-share funds are to be used for practices on land owned or controlled by the county
- for agreements or amendments where the cost-share amount for all practices for a landowner exceeds $50,000 in state funds
- for grade stabilization structures and agricultural sediment basins with embankment heights between 15 and 25 feet and impoundment capacities of 15 to 50 acre feet
- for streambanks to be controlled using riprap or other materials with banks over 6 feet high
- for animal lot relocation
- for roofs over barnyards or manure storage facilities

Local Assistance Grant Agreement Administration

General Information

The Local Assistance Grant Agreement (LAGA) is a grant from the DNR to Winnebago and Outagamie counties to fund the local staff and support costs necessary to carry out this

watershed plan. Each county will have its own agreement. Consistent with NR 120, the counties will use funds from the LAGA for additional staff to implement the project and conduct information and education activities. Other items such as travel, training, and certain office supplies are also supported by the LAGA. Further clarification of eligible costs supported by this grant is given in NR 120.14(4) and (6).

Grant Agreement Application Procedures

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

Fiscal Management Procedures and Reporting Requirements

Winnebago and Outagamie counties are required by NR 120 to maintain a financial management system that accurately tracks the disbursement of all funds used for the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project. The records of all watershed transactions must be retained for 3 years after the date of final project settlement. A more detailed description of the fiscal management procedures can be found in NR 120.25 and NR 120.26.

NR 120 requires quarterly reports to DATCP from each county in accordance with s. Ag. 166.40(4) accounting for staff time, expenditures, and accomplishments regarding activities funded through the watershed project. Reimbursement requests are submitted to the DNR Bureau of Community Assistance.

Project Budget and Staffing Needs

This section, and tables 5-4 and 5-5, estimate the funding and staffing required to provide technical assistance and implement the rural portion of this project. These estimates are based on needs identified for Winnebago and Outagamie counties.

Staff Needs

Table 5-4 lists the total estimated staff needed to implement the project in Winnebago and Outagamie counties respectively. Figures are provided for both the 50% and 75% levels of participation. Table 5-5 provides total project cost information, including staff costs, at the 75% level of participation. A total of about 39,000 staff hours is required in Winnebago County and 25,000 staff hours in Outagamie County to implement this plan at a 75% landowner participation rate. This includes 6,400 staff hours in Winnebago and Outagamie counties to carry out the information and education program.

The Winnebago County Land & Water Conservation Department may hire additional staff within the first three years of the project. The Outagamie County Land Conservation Department may also hire additional staff within the first three years of the project. The counties will each assess the number and type of staff required for the final five years of the project based on the actual landowner participation following the three year cost-share signup period.

Total Project Cost

The total state funding required to meet the rural nonpoint source pollution control needs at a 75% level of landowner participation is presented table 5-5. This figure includes the capital cost of practices, staff support, and easement costs presented above. The estimated cost to the state would be $1.85 million and $0.95 million in Winnebago and Outagamie counties respectively.

Schedules

Grant Disbursement and Project Management Schedule

Following approval of this watershed plan by the Winnebago County Board, Outagamie County Board, DATCP and the DNR, implementation will begin when the counties accept the Nonpoint Source Grant Award.

The priority watershed project implementation period lasts eight years. Implementation begins with an initial three year period for contacting eligible landowners and signing cost-share agreements. Practices on any cost-share agreement must be installed within a five year period.

Under extenuating circumstances, the initial period for entering into cost-share agreements can be extended by DNR for a limited period of time if it will result in a significant increase in nonpoint source control. Limited extensions for the installation period for practices on individual cost-share agreements must also be approved by the DNR and DATCP.

The disbursement of the grants (Local Assistance and Nonpoint Source) to Winnebago and Outagamie counties will be based on an annual workload analysis and grant application process. The estimated grant disbursement schedule based on 75% participation by eligible landowners can be found in tables 5-6a and 5-6b for Winnebago County and Outagamie County respectively.

Table 5-4. Estimated County LCD Staff Needs for Project Implementation

Activity	Project Years When Work Will Be Done	WINNEBAGO COUNTY		OUTAGAMIE COUNTY	
		75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)	75% Landowner Participation (Staff Hours)	50% Landowner Participation (Staff Hours)
Project and Financial Management	1-8	8,800	8,800	8,800	8,800
Information and Education Program	1-8	3,200	3,200	3,200	3,200
Pre-Contact Office Inventory; Landowner Contracts and Progress Tracking	1-3	7,500	5,000	3,750	2,500
Conservation Planning and Cost-Share Agreement Development	1-3	2,025	1,350	1,013	675
Plan Revisions and Monitoring	1-8	825	550	413	275
Practice Design and Installation	1-8				
Upland Sediment Control		10,030	6,687	3,577	2,384
Animal Waste Management		5,017	3,345	3,554	2,369
Streambank Erosion Control		1,057	705	248	165
Training	1-8	800	800	400	400
Total LCD Workload:		39,254	30,436	24,953	20,768
Estimated Staff Required for Years 1-3:		3.0 per year	2.3 per year	1.8 per year	1.4 per year
Hours		5,909 per year	4,517 per year	3,681 per year	3,015 per year
Estimated Staff Required for Years 4-8:		2.2 per year	1.7 per year	1.3 per year	1.1 per year
Hours		4,306 per year	3,377 per year	2,782 per year	2,345 per year

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Winnebago and Outagamie County Land Conservation Department

Table 5-5. Total Project Costs at 75 percent Landowner Participation Rate			
Item	Outagamie County Costs (State Share)	Winnebago County Cost (State Share)	
Cost-Share Funds: Practices	$466,268	$1,095,688	Table 5-3 75% participation, state share
Cost-Share Funds: Easements	$300	$900	Table 5-3 75% participation, state share
Local Assistance Staff Support*	$419,204	$659,472	Table 5-4 total LCD workload x $16.80
Information/Education Direct	$23,475	$23,475	from I&E chapter does not include staff
Other Direct (travel, supplies, etc.)	$37,000	$75,000	from county's calculations
Engineering Assistance	$0	$0	from county's calculations
* Salary + Indirect = $35,000/year Total		0	0
Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Winnebago and Outagamie County Land Conservation Department			

Table 5-6a. Grant Disbursement Schedule at 75 percent Landowner Participation for Winnebago County

Item	Project Year 1	2	3	3 – 8
Cost-Share Funds: Practices	$219,138	$438,275	$438,275	$0
Cost-Share Funds: Easements	180	360	360	0
Local Assistance Staff Support	99,266	99,266	99,266	361,674
Information/Education: Direct	3,913	3,913	3,913	11,738
Other Direct: (travel, supplies, etc.)	15,000	15,000	15,000	30,000
Engineering Assistance	0	0	0	0
Totals	$337,496	$556,814	$556,814	$403,411

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Winnebago County Land Conservation Department

Table 5-6b. Grant Disbursement Schedule at 75 percent Landowner Participation for Outagamie County

Item	Project Year 1	2	3	3 – 8
Cost-Share Funds: Practices	$93,254	$186,507	$186,507	$0
Cost-Share Funds: Easements	60	120	120	0
Local Assistance Staff Support	61,842	61,842	61,842	233,678
Information/Education: Direct	3,913	3,913	3,913	11,738
Other Direct: (travel, supplies, etc.)	7,400	7,400	7,400	14,800
Engineering Assistance	0	0	0	0
Totals	$166,468	$259,782	$259,782	$260,215

Source: Wisconsin Department of Natural Resources; Wisconsin Department of Agriculture, Trade and Consumer Protection and the Outagamie County Land Conservation Department

Involvement of Other Programs

Coordination With State and Federal Conservation Compliance Programs

The Arrowhead River, Rat River and Daggets Creek Watershed Project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by DATCP, and the Federal Food Security Act (FSA) administered by the Soil Conservation Service. Conservation Farm Plans were completed for all landowners in FSA on December 31, 1989. Winnebago County completed FPP plans by the end of 1990.

There will be a need to implement the conservation plans and, in the future, amend these plans during the implementation phase of the watershed project. All local staff will be involved in revisions to the conservation plans developed for FPP and FSA resulting from management decisions and the installation of needed BMPs for nonpoint source pollution abatement while continuing to address other resource conservation problems. This comprehensive approach to farm planning will facilitate consideration of the various goals and objectives for all the programs in which the landowner participates.

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

Coordination with State and Federal Historic Preservation Laws

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

A large part of the watershed project has a rich Native American history. This area, mainly along Lakes Poygan, Winneconne, and Butte Des Morts, will need special consideration when structural BMPs are being considered. Settling basins, manure storage structures, and streambank or shoreline shaping and riprapping are likely practices that may impact archaeological sites. As discussed above, state and federal laws require preservation of archaeological resources within the framework of the Wisconsin Priority Watershed Program.

The Arrowhead River, Rat River and Daggets Creek Priority Watershed Project will address these concerns with the following procedures:

1. Counties will use State Historical Society inventory maps with the location shown of known archaeological sites.

2. Landowners interested in project participation will have their lands evaluated by county staff for the need to conduct an archaeological survey. The State Historical Society will determine the need for archaeological surveys. The counties and the DNR District NPS Coordinator will also be involved in this determination. A landowner questionnaire will also be used to identify additional noninventoried sites. The completed questionnaires will be sent to the State Historical Society for a determination of archaeological significance.

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

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

Information and Education Implementation Program

The Arrowhead River, Rat River and Daggets Creek (ARD) Priority Watershed Project Information and Education (I&E) Program is based upon recommendations from the ARD I&E Advisory and Citizens Advisory Committees. The purpose of an information and education program is to encourage people to change. In the ARD Priority Watershed Project, the desired changes are expressed as goals. The goals and the objectives needed to obtain them are described below.

Goal

Help property owners and other resource users adopt and maintain nonpoint source pollution abatement measures (best management practices - BMPs) in order to achieve the watershed goals outlined in chapter three.

To reach this goal, the following objectives must be met:

- Establish and maintain landowner awareness of the watershed project.
- Develop an awareness and understanding of nonpoint source pollution and the underlying ecologic and economic concerns.
- Establish and maintain landowner awareness of BMPs and the benefits they provide.
- Keep watershed residents informed about accomplishments in the watershed project.

The objectives can be met using different informational or educational activities. The I&E activities identified in this plan will meet each objective by addressing the following questions.

- What is the ARD priority watershed?
- How does nonpoint source pollution affect fish and wildlife?
- How does the watershed project benefit fish and wildlife?
- What are the benefits of participating in the watershed?
- What are the legal implications of participating in the watershed?
- What are the financial consequences and benefits of adopting BMPs?

Target Audiences

Every resident and resource user in the watershed will be included in the I&E activities. This will make the watershed project a community program that encourages every resident and resource user to help control nonpoint source pollution.

Several audiences will require special attention in order to meet the project goals. They include lakeshore property owners, industries that discharge into surface waters, homebuilders, pesticide and fertilizer dealers/applicators, farmers, elected and appointed government officials and recreational users.

Lakeshore property owners must understand that their activities can influence water quality and that nonpoint source pollution is more than an agricultural issue.

Industrial dischargers. Industries can support the watershed project by conducting educational programs that help their employees adopt nonpoint source reduction measures at home. Watershed I&E programs may also help these businesses and their employees become better natural resource stewards.

Homebuilders. Sedimentation is a serious problem in the watershed and home construction can contribute significant amounts of sediment to area waterways. Special programs will be prepared to educate contractors about the problem and to help them adopt erosion control practices.

Pesticide and fertilizer dealers/applicators. This audience is not limited to commercial applicators (such as yard care companies) and agrichemical dealers (such as co-ops). It also includes private applicators (farmers and homeowners) and large retailers such as K-Mart, Wal-Mart, Fleet Farm, Steins and hardware stores.

Farmers. A 1986 survey from the Milwaukee River Priority Watersheds Program reported that most farmers (88 percent) believed water quality should be protected. More than 90 percent, however, reported that their farms did not contribute to water quality problems. Farmers need to understand how their activities affect water quality and that they are not being singled out in the watershed project - other groups will also be asked to adopt changes that protect water quality.

Government officials should always be aware of watershed activities and accomplishments. This audience includes county, city, town, and village officials and their employees.

Natural resource users can receive the greatest benefits from a successful watershed project. They tend to be apathetic, however, because they fail to recognize how the watershed project applies to their immediate goals. A great deal of education is necessary for this audience. Once they understand how nonpoint source pollution affects their pursuits they may provide financial and human resources to support educational programs and install BMPs.

I&E Activities

The following activities are designed to address the questions listed. A detailed description of each activity is included beginning on page 108.

What is the ARD Priority Watershed Project?

direct mail, newsletters, Citizens Advisory Committee,UW-Extension meetings, media peer groups, presentations to service, conservation, business and youth organizations fact sheets, road signs, interpretive signs, placemats, fairs and community shows farm shows, interpretive display, conservation field days for youth, bulletin board video tapes, slide program

What are the financial consequences and benefits of adopting BMPs?

encourage reduced rental rates from equipment dealers, peer groups, demonstrations training sessions for agribusinesses, fact sheets, presentations, newsletter, workshops, tours and field days, one-on-one communication, video tapes, slide program

How does the watershed project benefit fish and wildlife?

display, presentations, interpretive signs, newsletter, media, fact sheets (such as Conservation Tillage and Wildlife), peer groups, bulletin board, video tapes, slide program

How does nonpoint source pollution affect fish and wildlife?

display, presentations, interpretive signs, newsletter, media, fact sheets (such as Conservation Tillage and Wildlife), peer groups, bulletin board, video tapes, slide program

What are the legal implications of participating in the watershed? (Are there any "strings" attached, public access requirements, maintenance requirements, etc.)

newsletters, Citizens Advisory Committee, UW-Extension meetings, media, peer groups, fact sheets, placemats, one-on-one communication, farm shows, video tapes, slide program

What are the benefits of participating in the watershed?

peer groups, demonstrations, fact sheets, presentations, newsletter, workshops, tours and field days, one-on-one communication, bulletin board, video tapes, slide program

NOTE: Researchers who evaluate cost-sharing (financial incentive) programs found that technical assistance and I&E activities must accompany cost-sharing in order to meet water quality goals. Without these activities, cost-shared practices tend to be mismanaged and not provide water quality benefits. The researchers also found that financial incentives, without education, can change the focus of a water quality program. Since cost-sharing rarely changes peoples' values, education helps cost-sharing recipients view the watershed as a natural resource program rather than a program for financing desired on-site improvements.

Evaluation

Two evaluations will be used in the watershed project. The first is an ongoing evaluation by the Land and Water Conservation Departments and the Department of Natural Resources. This evaluation will monitor participation rates and water quality improvements and be reported to watershed residents on a continuing basis. [Reasoning: If watershed residents can see results they may be more inspired to participate in the project].

The second is an evaluation of the I&E program. It will contain both a formal and informal component. The formal review will take place approximately every 18 months using focus groups. The informal evaluation will be ongoing as watershed residents and members of the Citizens Advisory Committee report on the I&E efforts. The information gathered from these activities will be used to improve the I&E strategy.

Description of I&E Activities

Direct mail. Brochures containing information on local water quality problems and the watershed project can be sent with utility bills and village or town mailings. The direct mail piece will draw attention to water quality problems and encourage watershed residents to become involved in the watershed project. Estimated printing and design costs are $830.00.

Newsletters. During the first three years of the watershed project newsletters will be prepared every three months. Once the sign-up period is over, newsletters will be mailed biannually. The newsletters will include project updates (using a timeline), accomplishment reports (including a list of project participants), feature stories on project participants, information on the watershed project, and helpful tips for reducing nonpoint source pollution. Printing and mailing costs are $1,000.

Newsletters from other organizations will also be used to share information. Examples include newsletters produced by the UW-Extension and the ASCS offices, service organizations and conservation and environmental organizations. There is no cost.

Peer groups. A group of farmers and conservationists, and anyone else who understands natural resource issues and/or are participating in the watershed will be identified (maybe under a fancy name such as the "Shed Heads") and asked to give presentations to their peers. This idea is based on the fact that farmers gather information from other farmers, friends and family, rather than agency staff, when considering new management techniques.

To facilitate the adoption of BMPs, farmers will be encouraged to talk to one another. This can be accomplished with a "Who is doing what" list. Watershed staff and CAC members will identify landowners who have adopted BMPs and ask for permission to include their names on a list. This list will be available in the ASCS, SCS, UWEX, and LCD offices as well as rural gathering points such as coffee shops and farm supply stores. This list will also be published in newsletters. There are minimal printing costs.

Media is a collective term for newspaper, television (including Oshkosh cable, Channel 10) and radio. These sources will be used to feature the efforts of watershed residents, announce watershed accomplishments, and provide information similar to that found in the newsletters. When a media source is selected to disseminate important information, every attempt will be made to use the other media sources as well. The goal is to have the message sent through a variety of channels (an ubiquitous message). Not only does this increase the chances of the message being received, but it creates a sense of importance. Therefore, careful planning must be used to time the delivery of messages with other sources, such as a direct mailings, newsletters, the placement of signs, etc. There is no cost.

Presentations. Many producer groups, service clubs, and youth, conservation and environmental organizations need speakers for monthly meetings. A list of potential speakers and topics will be given to these groups. Potential speakers include watershed staff, peer groups and volunteers. Prior to a presentation, the speaker(s) should understand the organization's goals and then relate the watershed project to these goals. When giving a

presentation to youth the presenter(s) should view the world through the eyes of children and not (for example) give a presentation to fifth or sixth graders on manure management. It is also recommended that the presenter(s) speak to the group leader or several teachers to determine what is appropriate for children. In addition the DNR and UWEX have numerous outdoor education materials for youth. These materials incorporate educational elements that facilitate learning. There is no cost.

Slide Program. LCD, UWEX and DNR staff will work with members of the Citizens Advisory Committee to produce a slide show that explains the watershed project. The slide show will include title slides and graphics. The estimated cost is $100.

Video tapes. Several excellent video tapes on nonpoint source pollution, nutrient and pest management practices, soil and water conservation practices, groundwater protection and the Nonpoint Source Pollution Abatement Program are available at no cost to the watershed project.

Citizens Advisory Committee. One of the responsibilities assigned to the Citizens Advisory Committee (CAC) is that of a liaison between watershed residents and watershed staff. The CAC, as representatives of the watershed residents, will identify informational needs and present them to the watershed staff. As communicators for the watershed staff, the CAC will educate watershed residents about the project, nonpoint source pollution and natural resource issues in the watershed. There is no cost.

UW-Extension meetings. County extension agents will be asked to promote the watershed project and present issues related to the watershed at their educational meetings (tours, workshops, field days, etc.). For example, cost-shared barnyard improvements could be included in quality milk meetings and heifer-housing tours; and local water quality concerns could be included in 4-H conservation programs. Estimated cost for printed material, $1,000.

Fact sheets contain "how to" information or explain complex ideas in a simplified format for specific audiences for a specific purpose. Examples include "How to Sign-up for Cost-Sharing", "Conservation Tillage Benefits for Wildlife", "The Ecological Consequences of NPS Pollution", and the "Yard Care and the Environment" series for homeowners. Fact sheets will be distributed at workshops and field days, given to landowners during on-site visits, and displayed in appropriate retail outlets such as lawn and garden centers, marinas, agribusinesses and sporting good stores. Fact sheets on the watershed project will also be given to media contacts and public officials to help them gain a better understanding of the project. (Most fact sheets will be produced by area extension agents and Madison-based DNR staff for statewide distribution). Printing costs $800 each.

Signs. Road signs will be placed at major water crossings to draw attention to the watershed project. The double-sided signs will be large (4 ft. x 8 ft.) and simple (containing the watershed logo and a large, brief message) so motorists can read them while driving 55 mph. Cost is $1,000 per installed sign. (Costs incurred during the project inventory).

Interpretive (or educational) signs will be placed at high-use areas in the watershed such as state wildlife areas, public access sites. The signs will contain information about the watershed, nonpoint source pollution (NPS) and the effects of NPS on fish and wildlife populations or water-based recreation. The cost is $750 each.

Placemats will be printed for restaurants in the watershed. The placemats should contain a watershed map, a brief description of the project, the project goals, and natural resource problems found in the watershed. Estimated costs for design and printing (10,000 copies) is $1,400.

Public shows include farm shows, home and garden shows, fairs, sport shows, etc. A booth at these shows should contain a professional-looking display and attractive publications that relate to the show theme or audience. For example, a display (including publications) on conservation tillage or manure management would be appropriate for a farm show but not for a sports show. The estimated cost is $600 per show for booth rental and printed materials (appropriate extension bulletins).

Displays. A professional-looking display will be developed using high-quality photographs and graphics. The display will tell a story with pictures (using very few words) and draw people in when surrounded by expensive trade displays. Once people are drawn in by the quality of the display (high-quality photographs) learning will take place through the accompanying publications.

In order to adapt the display to the audience, more than one set of photographs and text will be required. Headers, photographs and text will be needed for audiences interested in wildlife, fishing, agricultural BMPs and the watershed project.

To be effective a display must be used. When it is not being used at a show it should be in public libraries, nature centers, shopping malls and other high-traffic areas. Estimated display cost is $4,000 (including display board and 4 sets of graphic design elements).

Demonstrations will be included in field days and tours to help landowners reduce the economic and managerial risks they face when adopting new technologies. Most demonstrations will be funded through a watershed contract. Some demonstrations, however, will be initiated by property owners who want to test a new concept. They will receive technical help without cost-sharing.

Tours and field days can be effective ways to show new technologies and allow those property owners with BMPs to speak with those who are considering BMPs. Farmers should be the main speakers at these events and be encouraged to share their experiences, both positive and negative. Costs for refreshments, transportation, printed materials and postage are $400.

Workshops that feature demonstration results and farmers (as presenters) can help landowners adopt BMPs. When specific concerns are raised about new practices, however, "specialists" should be brought in to address the questions. Costs for refreshments, postage, printed materials and room rental are $400.

One-on-one communication is the most effective technique for encouraging landowner participation in a watershed project. It is also one of the most effective ways to encourage the adoption and proper maintenance of BMPs. One-on-one communication involves watershed staff listening to the needs and concerns of landowners and addressing those needs. It also requires individual teaching by watershed staff. Numerous studies have shown that farmers will not adopt BMPs if they do not see the need for them. Watershed staff must spend time with landowners to point out potential soil and water resource problems on their land. There is no cost.

Training sessions/volunteers. Agribusiness representatives are often misinformed about the proper management of BMPs. Examples include equipment dealers who are unfamiliar with the proper set-up and operation of conservation tillage implements. With proper training (sponsored by the watershed project) agribusiness representatives can help farmers adopt and properly manage BMPs. Agribusiness people include representatives from milk cooperatives, agrichemical suppliers, milking equipment dealers, implement dealers, and veterinarians. Estimated costs for refreshments, printed materials and room rental are $400.

Master gardeners will be trained to work with homeowners who desire healthy lawns and gardens. The Master gardeners will encourage the use of soil testing and integrated pest management (IPM) to promote the proper and judicious use of fertilizers and pesticides. Costs for printed materials and refreshments are $400.

Just as agribusiness representatives will be encouraged to support the watershed project, lawn care companies will also be encouraged to conduct business in an environmentally responsible manner and encourage homeowners to do the same. This activity will be supported by DATCP and UW-Extension (Madison) staff. There is no cost.

Other groups that will be informed about the watershed project and encouraged to support it include contractors, county department heads (especially in the highway, parks and zoning departments), real estate agents, and people who own and operate marinas. They will receive information through newsletters, personal visits, shows and presentations.

Bulletin boards located in private businesses will be used to display information about the watershed. The bulletin boards will be maintained by members of the Citizens Advisory Committee. There is no cost.

CHAPTER SIX
Integrated Resource Management

Introduction

The integration of resource management activities in the Arrowhead River, Rat River and Daggets Creek Priority Watershed will coordinate existing federal, state, and local programs. The ability to integrate programs will help achieve the best possible management of land and water resources in the project area. There are a number of specific program activities which will need coordination in the project and will involve several different agencies.

Agricultural Programs

USDA programs like the conservation reserve program (CRP), and the Agricultural Conservation Program (ACP) provide funding for projects that have a direct impact on water quality. These programs will continue to be used in the project area and will provide an additional source of funding for landowners, particularly in cases where a site is a nonpoint source of pollution but falls outside the scope of funding availability for Management Category II.

The Arrowhead River, Rat River and Daggets Creek Priority Watershed Project will be coordinated with the conservation compliance features of the Wisconsin Farmland Preservation Program (FPP) administered by the DATCP, and the Federal Food Security Act (FSA) administered by the Soil Conservation Service. Conservation Farm Plans developed for all landowners in the FSA and FPP programs will need to be amended to include management decisions and the installation of needed BMPs for nonpoint source pollution abatement. This comprehensive approach to farm planning will facilitate consideration of the various goals and objectives for all the programs in which the landowner participates.

DNR Resource Management Programs

The Wisconsin DNR fisheries and wildlife objectives for the Arrowhead River, Rat River and Daggets Creek watershed project have been identified and implementation activities developed. Some of these activities have a very direct relationship to water quality while others are more indirect as a result of improved resource management. General information and education activities described in chapter five will be used to help implement resource management objectives. These activities are listed at the end of this chapter.

Wildlife Management

The Rat River and Wolf River Wildlife Areas are within the Arrowhead River, Rat River and Daggets Creek Priority Watershed. The wildlife area master planning process is being revised and a new format will be used in the near future. The content of the master plans is not expected to change significantly. Future flowage developments on the Rat River Wildlife Area will be dependent on additional property acquisition. Any changes in the master plan will be addressed through the public hearing process.

Water quality improvements affect wildlife directly and indirectly depending on the species of animal. Therefore, the following specific wildlife management objectives have been developed.

- Objective #1: Continue spraying the cattails obstructing the Rat River channel to enhance waterflow.

  With the reduction of nutrient laden runoff, the cattail growth within the channel should decrease thereby reducing the excess water upstream from the constriction in the river.

- Objective #2: Conversion of canary grass to a sedge and shrub/forb complex.

  Monotypic stands of canary grass are very poor wildlife habitat and the conversion to native species that originally grew in these areas improve the land for many species.

- Objective #3: Establish nesting cover on remaining upland areas and control brush in wildlife openings.

  A mixture of native warm-season grasses and forbs will be planted rather than the monotypic switchgrass fields for nesting cover.

- Objective #4: Continue wetland and grassland restoration projects on private lands.

  If native warm-season grasses and forbs are not used to establish nesting cover, then alfalfa, red and white clover, timothy, and orchard grass may be planted. There may be possible cost-sharing of the surface water impoundments by a federal agency.

- Objective #5: Promote Conservation Reserve, Wetland Reserve, and Stewardship Incentives Program.

  This ties in with the wetland and grassland restoration work on private lands. Work is done on lands that will be taken out of production and may be put into wildlife habitat.

- Objective #6: Promote tree harvest operations which are conducive to oak regeneration. Acorns are an important wildlife food source.

  Planting oak, hickory, and native fruit and nut-bearing shrubs in clumps is another aspect of forestry that is being promoted.

- Objective #7: Promote roadside mowing according to a plan which is beneficial to wildlife.

  The delay of cutting roadsides until after August 1 will reduce nest destruction. The cutting of the right-of-way directly adjacent to the road and not up to the fenceline will also reduce the number of deer attracted to the newly mown grass. The remaining area may be cut every third year if needed to control invading brush.

- Objective #8: Delay the mowing of grassed waterways until after August 1. Leaving field borders also increases wildlife habitat and reduces sediment delivery from fields.

  Reducing the destruction of nests will increase game and non-game wildlife and the added vegetation will filter out sediments to improve water quality.

- Objective #9: Promote the Purple Loosestrife control program.

  The control of this plant is necessary because it displaces more desirable wetland vegetation. This exotic plant has little value as wildlife cover or food and is considered a nuisance invader.

- Objective #10: Protect the remaining stands of deciduous bottomland hardwoods from forest fragmentation.

  Riparian forest buffers remove the effects of pollutants in runoff and increase the biological diversity and productivity of stream communities.

- Objective #11: Provide Osprey nesting platforms in appropriate habitat.

  The use of artificial nesting platforms has proven to be effective in the re-establishment of this species. The adjacent large lakes and rivers provide excellent habitat for ospreys because fish is their primary food source. Summer sightings on Lake Poygan may be a breeding pair or juveniles scouting for a territory.

- Objective #12: Monitor area for amphibians.

  Amphibians are an excellent indicator species for environmental quality and global climate change. Their complex life cycles, insectivorous habits, permeable skin, and sensitivity to water chemistry in the egg and larval stages make them excellent bioindicators of environmental stress.

- Objective #13: Promote the use of GEOWEB Grid Confinement System instead of rock riprap on the shoreline of rivers and lakes for increased wildlife cover. A gradual slope will allow wildlife to travel between the aquatic and terrestrial habitats.

  The mesh webbing allows plants to grow on the shoreline creating less abrupt transition between aquatic and terrestrial ecosystems. An additional buffer strip of 100 feet along the shoreline will filter out any sediments and improve water quality. Within the buffer strip areas of sand will promote turtle nesting, especially for the Blanding's turtles.

- Objective #14: Ensure wildlife habitat mitigation where habitat is lost due to construction of Best Management Practices.

  Wildlife protection is required by administrative rule for a number of best management practices that will be installed in the project. Wildlife habitat shall be recreated to replace wildlife habitat lost through removal due to the construction of the following best management practices:

  Contour and field stripcropping
  Field diversions
  Terraces
  Grassed waterways
  Critical Area Stabilization
  Grade Stabilization Structures
  Shoreline Buffers

Evaluation and Monitoring

Amphibian populations will be assessed using auditory roadside surveys for frogs and toads, and possibly drift fences. This will determine existing and changing water quality and land uses. Calling surveys will be done at each monitoring site when the water temperatures reach 50°F, 60°F, and 70°F.

Fisheries Management

The Arrowhead River, Rat River and Daggets Creek Priority Watershed is within the area covered by Oshkosh Area Fisheries Management and the Winnebago Comprehensive Management Plan. Water quality improvements will directly impact the state of fisheries in the project area; therefore, specific management objectives have been developed. The

following fisheries objectives are the areas of concern to Fisheries Management staff and the Winnebago System Biologist.

- Objective #1: Periodically survey the Arrowhead and Rat Rivers and Daggets Creek to monitor changes in the fishery as the Priority Watershed Plan is implemented.

- Objective #2: Increase the quality of fish and wildlife habitat on the upriver lakes and their tributaries.

- Objective #3: Determine the relative abundance of fish populations in the upriver lakes.

- Objective #4: Develop lake sturgeon management objectives for the upriver lakes.

- Objective #5: Increase the northern pike population in the upriver lakes to three adults per acre, and the yellow perch population of fish larger than eight inches from the current five fish per acre to twenty fish per acre in the Winnebago Pool.

- Objective #6: Encourage shoreline protection measures that enhance fish and wildlife habitat such as retaining the natural shoreline if erosion is not a problem, and using shaped riprap instead of seawalls where erosion is a problem.

Information and Education Activities

Information and education activities which will be used to help implement integrated resource management objectives include:

- information sharing through direct landowner contacts made by project staff

- facilitate sharing of information between project area landowners

- radio, television, and/or local press coverage when feasible

- featuring practices on project tours and field days whenever practical

- featuring practices on project's display exhibit

- articles in the project's newsletter and other newsletters servicing the project area

- distributing existing printed materials where feasible.

CHAPTER SEVEN
Progress Assessments

Introduction

This chapter describes how progress will be monitored in the Arrowhead River, Rat River and Daggets Creek Priority Watershed Project. The strategy includes two components:

1. administrative review

2. pollution reduction evaluation

Information on these components will be collected by the county Land Conservation Department (LCD) and reported to DNR and DATCP. The DNR's Bureau of Community Assistance will provide additional information on the number and types of practices on cost-share agreements, funds encumbered on cost-share agreements, and funds expended.

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

Administrative Review

This component will focus on the progress of the counties in implementing the project. The project will be evaluated with respect to:

- amount and types of BMPs on Cost-share Agreements and installed (accomplishment reporting)

- financial expenditures

- staff time spent on project activities

Accomplishment Reporting

The Computer Assisted Management and Planning System, (CAMPS) is a computer data management system that has been developed by the US Soil Conservation Service (SCS). It is used by SCS, DNR and DATCP to meet the accomplishment reporting requirements of all three agencies. Data on administrative accomplishments will be collected by each county LCD using CAMPS, and will be provided to DNR and DATCP for program evaluation.

The County LCD's will provide the following data to DNR and DATCP on a quarterly basis:

- number of personal contacts made with landowners
- completed I&E activities
- number of farm conservation plans prepared for the project
- number of cost-share agreements signed
- pollutant load reductions associated with planned practices
- number of farm conservation plan and cost-share agreement status reviews completed
- number of farms and acres of cropland checked for proper maintenance of BMPs

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

Financial Expenditures

The LCD will provide the following financial data to DNR and DATCP on a quarterly basis:

- number of landowner cost-share agreements signed
- amount of money committed on cost-share agreements
- number of landowner reimbursement payments made, and amount paid for BMP installation
- expenditures for staff travel
- expenditures for information and education programs
- expenditures for equipment, materials, and supplies
- expenditures for professional services and staff support costs

- total project expenditures for LCD staff
- staff training expenditures
- interest money earned and expended
- total county LCD budget and expenditures on the project

Time Spent On Project Activities

The LCD will provide time summaries to both departments for the following activities on a quarterly basis:

- project and fiscal management
- clerical assistance
- pre-design and conservation planning activities
- technical assistance: practice design, installation, cost-share agreement status review and monitoring
- educational activities
- training activities
- leave time

Pollutant Reduction Evaluation

Purpose

The purpose of this evaluation component is to calculate reductions in the amount of key pollutants as a result of planning and installing Best Management Practices. The primary means for tracking planned and installed pollutant reductions is through the use of the Operating Unit's Wisconsin Data Listing report in CAMPS. Running this report for each landowner at the time of cost-share agreement preparation will provide the initial planned reductions, and also will ensure the base of information necessary to run future summary reports is entered in CAMPS. Five key sources have been identified for estimating changes in pollutant loads in the Arrowhead River, Rat River and Daggets Creek Watershed: upland sediment, runoff from barnyards, number of acres managed under a nutrient management plan, gully erosion, and streambank erosion. The tracking procedure for each source is described below.

Tracking Procedure

Upland Sediment Sources

County LCD staff will be responsible for determining the estimated sediment control achieved through planned and installed Best Management Practices. The county will report the information to DNR through CAMPS.

Barnyard Runoff

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

Manure Spreading

The county staff shall record the number of SCS 590 nutrient management plans developed, the number of acres managed by the plans, and the average pounds per acre of nitrogen and phosphorus credited from manure and other sources.

Gully Erosion

The county will record for each landowner, the number of gullies and the sediment being generated by the gullies at the time of contact, the number of gullies to be controlled through Best Management Practices identified on the Cost-share Agreement, and the tons of sediment reduced through control of the gullies.

Streambanks and Shorelines

The county LCD will calculate changes in streambank and shoreline sediment in terms of tons of sediment and length of eroding sites. A tally will be kept of landowners contacted, the amount of sediment being generated at the time of contact, changes in erosion levels estimated after installing Best Management Practices, and the number of fish habitat structures installed if any. Much of this information will be provided through CAMPS.

CHAPTER EIGHT
Evaluation Monitoring Program

Goal and Objectives

The goal of the priority watershed evaluation monitoring program is to evaluate the progress of the nonpoint source control program toward improving the quality of water resources.

Evaluation monitoring objectives are to:

- Evaluate the attainment of water quality "objectives" that result from implementation of best management practices at specific sites.
- Evaluate the attainment of pollutant load reduction goals, and the effectiveness of those goals in improving water quality at specific sites.
- Evaluate the implementation of BMPs needed, and their effectiveness, to reduce problems contributing to non-attainment of water quality objectives at specific sites.
- Evaluate the priority watershed plans applicability to the management of water resources, and the attainment of water quality standards and beneficial uses.

Program Organization

Evaluation monitoring activities in priority watersheds will be planned and conducted according to monitoring program guidance in the Bureau's Surface Water Monitoring Strategy.

Evaluation monitoring can be conducted at selected sites in basins on the 5-year basin assessment schedule. Also, monitoring can be conducted at selected sites as special projects, depending on other monitoring priorities.

Evaluation monitoring may be conducted on selected waterbodies in priority watersheds that meet specific site selection criteria. These sites would be part of a statewide strategy designed to meet the program evaluation monitoring goal and objectives. Evaluation monitoring need not be conducted in each priority watershed.

Site Selection Criteria

The following criteria are suggested for site selection in agricultural watersheds to be intensively evaluated as part of basin assessments, or as special projects:

Location

- BMPs are planned but not yet implemented in priority watersheds.
- Serious water quality or habitat problems, or both, exist and a direct cause/effect relationship between problems and nonpoint sources are obvious.
- High probability exists that appropriate BMPS will be installed in the site's watershed. If possible, final monitoring site selection should come after cost-share agreements have been signed. Extra effort should be made to achieve full participation by all land owners.
- Sites are not meeting attainable uses and have a high potential to improve following management of nonpoint sources.
- Reference sites with similar characteristics, including attainable uses, are available in the same or adjacent watersheds. A reference site can be either an impacted site that will not be managed, or preferably, a site without water quality problems and meeting attainable uses. The important consideration is that reference site conditions are not expected to change except due to climatic conditions.
- Sites have adequate access for sampling personnel and equipment.

Size

- Sites should be located on permanent streams large enough to support well developed fish communities. Streams should be 5 to 30 feet wide with base flows of 1 to 20 cfs.
- Watersheds should be manageable with areas of 5 to 50 sq. miles.

Water Quality

- Suspected or known water quality problems should be caused by manageable nonpoint sources, such as barnyards or feedlots;
- Point sources should not be present or not significant; and
- Potential sources of problems that cannot be managed, or are unlikely to be managed, should not be present.

Habitat

- Habitat problems should be caused by poor land use practices immediately adjacent to the site or near the site.
- In stream habitat should have a high potential to improve following implementation of BMPs.
- Sites should not be selected that have been ditched within 10 to 15 years.

Site Selection Process

Potential evaluation monitoring sites can be located while conducting basin assessments, or while conducting appraisal monitoring in newly selected priority watersheds. Selecting potential sites during the appraisal monitoring process is recommended.

Reconnaissance surveys can be conducted to locate sites that meet evaluation monitoring criteria in on-going priority watershed projects. When potential sites are located by reconnaissance, data should be obtained to determine if site selection criteria are met. County staff should be contacted to determine the potential for land owner participation.

Sites selected for evaluation should meet most of the selection criteria, including the presence of appropriate reference sites.

Evaluation Monitoring Approaches

Priority watershed evaluation monitoring projects can be conducted as part of basin assessments on a 5-year schedule, or as special projects subject to Bureau approval of annual monitoring plans. Intensive evaluation monitoring will continue to be conducted at "master monitoring" sites by the Bureau of Research, USGS, and WRM staff. Basin assessments, special projects, and monitoring project work planning are discussed in the Bureau's Monitoring Strategy.

The following evaluation monitoring options are provided as guidance for developing monitoring plans. Any option, or a combination of options, may be used for evaluating priority watershed projects.

Basin Assessment Approach

1. Select specific sites in priority watersheds that meet site selection criteria, including at least one reference site per treatment site. Intensively monitor these sites during the basin assessment year to establish pre-implementation surface water conditions. Evaluation monitoring projects should be designed to fit individual site characteristics, but should generally include collection of water chemistry, habitat, fish community and macroinvertebrate data.

   These same sites should be monitored again in 5-years (post-implementation) when the basin is scheduled to be reassessed. These data would be compared to pre-implementation data to evaluate site specific improvements resulting from implementation of BMPs. Monitoring on a 5-year schedule could continue if appropriate.

2. Repeat appraisal type monitoring at selected sites in priority watersheds on the 5-year basin assessment schedule.

   The general water resource conditions in all priority watersheds will be assessed by conducting appraisal monitoring for developing priority watershed management plans. Appraisal monitoring provides a general water resource quality and problems assessment that, when repeated during future basin assessments, can be used to evaluate surface water quality improvements, especially where they are significant.

   When conducted on the 5-year basin assessment schedule, pre-implementation appraisal monitoring data may be compared to watershed wide assessment data (collected using appraisal monitoring techniques), to provide a general, but adequate, priority watershed project evaluation.

   This approach would provide an evaluation of more surface waters in a priority watershed, and an evaluation of the overall results of a priority watershed project.

Special Project Approach

This approach is essentially the same as the basin assessment intensive monitoring approach (option one), except that sites may be monitored more frequently, and would be planned as special projects. Guidance for special project planning is provided in the Bureau's Monitoring Strategy.

The Bureau recommends a 5-year basin assessment monitoring approach, as discussed in option two. The exception is that an intensive special project monitoring approach may be recommended at unique sites where problems are severe, the resource has a high value, participation levels are high, and a measurable response is anticipated.

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APPENDIX A
Watershed Planning Methods

This appendix describes the steps and procedures used to prepare this plan. These are:

- Evaluating water quality and aquatic habitat.
- Assessing pollution sources.
- Establishing water resource objectives.
- Establishing pollution reduction goals.
- Developing a nonpoint source control strategy.
- Involving the public and local units of government.

Evaluating Water Quality and Aquatic Habitat

The Department of Natural Resources (DNR) is responsible for: designating the biological and recreational uses that surface waters can support under proper management; prescribing the water quality required to sustain these designated uses; and indicating the methods to implement, achieve and maintain those conditions.

The DNR's Lake Michigan District Water Resources and fisheries Management staff conducted investigations of the existing quality and natural resource conditions during 1991. Their purpose was to evaluate water quality problems and establish a basis for setting water resources management objectives. Detailed assessment results are documented in water resource appraisal reports.

Data Collection

The following is a summary of the four elements comprising the water quality and aquatic habitat investigation.

Subwatershed Delineation and Stream Segmentation

Prior to collecting field data, the watershed was divided into 7 hydrologic subwatersheds. This was accomplished using 1"=400' scale aerial photographs and 1"=2,000' (7.5 minute) U.S. Geological Survey quadrangle maps. These maps were also used to divide the

perennial and intermittent stream network into segments. Stream segments were used to separate portions of waterways where either natural conditions or human-induced changes resulted in pronounced differences in stream character and/or water quality.

Stream Habitat Evaluation

Information characterizing stream habitat—including flow rate and depth, substrate quality, channel configuration, stability, and water temperature—were collected using techniques that the DNR developed. The data were evaluated using DNR's Stream Classification Guidelines (Ball, 1982).

Water Quality Assessment

Surface water quality was assessed through review of historical water chemistry data and an evaluation of bottom dwelling animals (macroinvertebrates) using the Hilsenhoff Biotic Index (Hilsenhoff, 1982). Extensive bacteria (fecal coliform) surveys were conducted to assess the suitability of surface waters for recreational use. Private well samples were collected and analyzed for nitrate + nitrite and triazine herbicides. Analytical data were used to assess the quality of groundwater in the watershed.

Fisheries Resource Assessment

Fish communities were assessed qualitatively using a combination of historical data and information collected during this investigation. Resident fish populations in the streams, lakes, and impoundments were sampled using seines and electric shocking equipment.

Data Interpretation

The data described above were used to determine the existing and potential biological and recreational uses for surface waters. The existing uses reflect present biological and recreational conditions. Potential uses reflect biological and recreational conditions that could be achieved under prescribed types and levels of management. Even though existing and potential uses of a surface water are the same, management programs can result in significant changes in the quality of the aquatic environment. Use classifications and supporting water quality standards used in evaluating water resource conditions are discussed below.

Biological Stream Use Classification

Biological stream use classes describe the fish species or other aquatic organisms which a stream system supports. Designation is based on the ability of a stream to provide suitable habitat and water quality conditions for fish and other aquatic life. The following biological stream use classification system was used statewide and was applied to surface waters in the Arrowhead River, Rat River and Daggets Creek Watershed.

COLD= Cold Water Communities include surface waters capable of supporting a community of cold water fish and other aquatic life or serving as a spawning area for cold water fish species.
WWSF= Warm Water Sport Fish Communities include surface waters capable of supporting a community of warm water sport fish and/or serving as a spawning area for warm water sport fish.
WWFF= Warm Water Forage Fish Communities include surface waters capable of supporting an abundant diverse community of forage fish and other aquatic life.
LFF= Limited Forage Fish Communities

Recreational Stream Use Classification

Recreational stream use classifications are described by a level of human body contact determined to be safe and reasonable. The system applies to all surface waters including those categorized as intermediate or marginal under the above referenced biological use classification system. Three designations are used under the recreational stream classification system. These designations are full body contact, partial body contact, and noncontact.

Full Body Contact: These waters are used for human recreation where immersion of the head is expected and occurs often. Recreation activities classified as full body contact include swimming, waterskiing, sailboarding and other similar activities.

Partial Body Contact: These waters are used for human recreation where immersion of the head is not frequent and contact is most often incidental or accidental. Recreational activities classified as partial body contact include boating, canoeing, fishing and wading.

Noncontact: These waters should not be used for human recreation. This category is used infrequently when extenuating circumstances such as high concentrations of in-place pollutants, an uncontrollable pollution source, or other conditions dictate that contact with the water would be an unnecessary health risk.

Water Quality Standards and Criteria

Surface water quality standards and criteria are expressions of the conditions considered necessary to support biological and recreational uses. Water quality standards for recreational and biological uses are contained in Chapters NR 102, NR 104, and NR 105 Wisconsin Administrative Code.

In addition to these standards, other criteria were used to assess the suitability of surface waters for recreational and biological uses. Data characterizing stream size and accessibility were used to help determine the suitability and types of recreation a stream is capable of supporting. Information on current recreational use of surface waters (provided by users at

public access points and discussions with local officials) was also used to assess suitability of surface waters for recreation.

Additional information used to assess the suitability of surface waters for biological uses includes recommended maximum nutrient levels, suspended solids concentrations and the extent to which streambeds are clogged with sediment.

Groundwater quality standards for substances of public health concern and public welfare concern are contained in Chapter NR 140 Wisconsin Administrative Code. If well samples results exceeded the nitrate + nitrite ES, owners were sent a notice warning them that infants under six months and pregnant women should not drink the well water. At nitrate + nitrite levels greater than 40 mg/L, owners are eligible to apply for well compensation funds from the Bureau of Water Supply. If well sample results using the triazine screen exceeded 1 μg/L, wells were resampled and analyzed specifically for atrazine and it's metabolites. This was free of charge and on voluntary basis by the Bureau of Water Supply who assisted well owners in obtaining a clean water supply.

Assessing Pollution Sources

The purpose of the pollution source assessment is to identify the rural and urban sources and quantities of pollutants impacting surface waters. Rural and urban pollutant sources assessed for this watershed are discussed below.

Rural Nonpoint Sources

Excessive quantities of sediment, nutrients, oxygen demanding substances, pesticides and bacteria are pollutants carried in runoff draining agricultural areas. These pollutants degrade surface water quality thereby restricting recreational and biological uses. The principal rural nonpoint sources evaluated in preparing this plan include:

- Barnyards and livestock area runoff.
- Eroding uplands delivering sediment to surface waters.
- Eroding, slumping, or trampled streambanks.
- Areas contributing runoff of winterspread livestock manure.
- Gullies.

The Outagamie and Winnebago County project staff conducted inventories 1991. The DNR in cooperation with the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) and the Outagamie and Winnebago County project staff completed the data analyses. Inventory and evaluation procedures are summarized below.

Barnyard and Livestock Area Runoff

The County project staff mapped the locations of 156 barnyards in the watershed on 1"=400' scale aerial photographs. A field survey of each barnyard was conducted to collect information needed to determine its pollution potential.

The barnyard data was used in the "BARNY" Model (Baun, 1992), a modification of the animal lot runoff model, which the U.S. Department of Agriculture, Agricultural Research Service developed (Young, 1982). Information about the mass loading of total phosphorus annually was generated to evaluate the relative pollution potential of each barnyard. The livestock operations were ranked according to their potential to impact surface and/or groundwater quality.

Upland Erosion and Sediment Delivery

The county project staff conducted the inventory on about 29 square miles, or 22% percent of the watershed, using existing data and field investigations. Cropland, pastures, grasslands, woodlands and other open (non-urban) land uses were investigated. Existing data sources included site specific farm conservation plans, 1"=400' scale aerial photographs, and U.S. Geological Survey 1"=2,000' scale quadrangle maps. The information obtained for each parcel included size, soil type and erodibility, slope percent and length, land cover, crop rotation, present management, overland flow distance and destination, channel type and receiving water.

Upland erosion and sediment delivery was determined using the Wisconsin Nonpoint Source (WIN) Model (Baun & Snowden, 1992). The WIN model calculates the average annual quantity of eroded soil reaching surface waters from each farm field. The determination is made based on a "typical" year of precipitation. Estimated sediment delivery was used to assess the relative pollution potential of each farm field in the watershed.

Streambank Erosion

The County project staff and the DNR conducted field surveys on about 40 miles of perennial and intermittent streams located in rural areas. The method used is a modification of the streambank erosion analysis included in Phase II of the Land Inventory Monitoring process used by the U.S. Department of Agriculture, Soil Conservation Service. At locations where erosion was occurring, the following information was recorded:

- Length of trampled or eroding bank.
- Vertical height.
- Estimated annual rate of recession.
- Adjacent land uses.
- Potential management measures.

The amount of sediment lost annually was calculated for each erosion site. In addition, areas adjacent to streams impacted by livestock, but which were not necessarily eroding at a high rate, were also noted.

Runoff from Areas Winterspread with Livestock Waste

This analysis was done to estimate the pollution potential associated with winterspreading livestock waste in the watershed. The information collected for the barnyard and upland erosion surveys was used in this evaluation.

This analysis was completed using a three-step process. First, previous research (Moore,1979) was used to estimate the percentage of the total animal waste load attributable to manure spread runoff and stacking leachate. Second, the number of acres that each livestock operation needed to landspread manure was calculated for a six-month period approximating when manure cannot be incorporated into the ground because of frozen or saturated conditions. The amount of manure that each operation generated was based on the number and type of livestock. The area required for spreading was based on an application rate of 100 pounds of phosphorus tons per acre per year.

Third, the land available to each livestock operation for winterspreading was characterized according to its environmental sensitivity. Lands which did not meet the criteria in SCS 590 were considered to have a high potential to deliver landspread manure to lakes and streams during periods of spring thaw. Operations lacking enough suitable acres for winter spreading were then easily identified and a relative pollution potential for each operation due to runoff of winterspread manure was calculated.

Other Pollution Sources

Additional sources of surface water pollution beyond those discussed in this plan are degrading water quality in the watershed. These pollution sources have the potential of overshadowing improvements in water quality that might otherwise occur as a result of the priority watershed program. Some of these potential sources of water pollution are identified in chapter four of this plan.

In addition, the DATCP, the DNR, and the UWEX are cooperatively working through a technical committee to define fertilizer and pesticide use guidelines to minimize threats to surface and groundwater quality. The results will be applicable statewide and will be incorporated into this watershed project when available.

Establishing Water Resource Objectives

Water resource objectives were established for each of the streams and lakes in the watershed. These objectives identify how the project is anticipated to change the quality of the aquatic environment for recreational and biological uses. Factors considered in establishing water resource objectives include: existing water quality and aquatic habitat; factors or pollutants that may be preventing the surface water from reaching its full potential of supporting biological and recreational uses; and the practicality of reducing pollutants.

Establishing Pollution Reduction Goals

Nonpoint pollution reduction goals are estimates of the level of nonpoint source control needed to meet the water quality and recreational use objectives identified in this plan. Pollution reduction goals and water resource objectives are established together since they are integrally related.

The nonpoint source pollution reduction goals in this plan specifically target the control of sediment and phosphorus in rural areas. Importantly, reducing the quantity of these substances reaching surface waters decreases the amount of other substances such as pesticides and bacteria which degrade water quality

Developing a Nonpoint Source Management Strategy

The final step in the planning process is the development of a strategy for achieving the nonpoint source pollution reduction goals identified in the plan. Several items are addressed in developing the management strategy including:

- Critical nonpoint pollution sources.
- Effective management practices and guidelines for use of state cost-share funds for practice installation.
- Responsibilities, estimated workloads and work schedules for local implementing agencies, and guidelines for use of state funds to support local implementation activities.
- Estimated cost of installing practices and supporting staff at the local level.
- Information and education needs.
- Project evaluation needs.

Identification of critical nonpoint sources eligible for cost-share and technical assistance under the Nonpoint Source Water Pollution Abatement (NPS) Program were determined by:

- Evaluating pollutant loading for each nonpoint source in each subwatershed.
- Determining the relative importance of controlling each source (barnyards, urban runoff, cropland erosion, etc.) to achieving the water resource objectives.
- Developing criteria to determine which sources need to be controlled.
- Applying the criteria to determine eligibility for participation in the priority watershed project.

This evaluation was carried out on a subwatershed and watershed basis for the rural nonpoint sources. The result is a site specific ranking of nonpoint sources and a determination of assistance to be made available through the nonpoint source program for the control of NPS pollution, financial and technical.

Involving the Public and Local Units of Government

The DNR convened a citizen's advisory committee and several technical work groups to help prepare this watershed plan. The advisory committee contains representatives from counties, villages, and towns in the watershed, local farmers, UWEX, DATCP, environmental groups and interested citizens. This advisory committee primarily provided policy guidance during the planning process and reviewed plan chapters.

Three types of technical work groups were convened to help with developing technical aspects of the plan: a water quality appraisal work group, a land resources work group and an information and education work group. These groups reviewed land and water resource assessment information, assisted in developing water resource objectives and pollution reduction goals and assisted in developing the pollution control strategy.

GLOSSARY

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

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

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

AREA OF CONCERN:
Areas of the Great Lakes identified by the International Joint Commission (IJC) as having serious water pollution problems.

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

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

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

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

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

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

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

BIOCHEMICAL OXYGEN DEMAND (BOD):
A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. BOD_5 is the biochemical oxygen demand measured in a five day test. The greater the degree of pollution, the higher the BOD_5.

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

BIOTA:
All living organisms that exist in an area.

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

CATEGORICAL LIMITS:
All point source discharges are required to provide a basic level of treatment. For municipal wastewater treatment plants this is secondary treatment (30 mg/1 effluent limits for SS and BOD). For industry the level is dependent on the type of industry and the level of production. More stringent effluent limits are required if necessary to meet water quality standards.

CHLORINATION:
The application of chlorine to wastewater to disinfect it and kill bacteria and other organisms.

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

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

CONSUMPTION ADVISORY:
A health warning issues by WDNR and WDHSS that recommends that people limit the fish they eat from some rivers and lakes based on the levels of toxic contaminants found in the fish.

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

CONVENTIONAL POLLUTANT:
Refers to suspended solids, fecal coliforms, biochemical oxygen demand, and pH, as opposed to toxic pollutants

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

CRITERIA:
See water quality standard criteria.

DISINFECTION:
A chemical or physical process that kills organism that cause disease. Chlorine is often used to disinfect wastewater.

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

DREDGING:
Removal of sediment from the bottom of water bodies.

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

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

EFFLUENT LIMITS:
The Department of Natural Resources issues WPDES permits that establish the maximum amount of pollutant that can be discharged to a receiving stream. Limits depend on the pollutant involved and the water quality standards that apply for the receiving waters.

ENVIRONMENTAL PROTECTION AGENCY (USEPA):
The federal agency responsible for enforcing federal environmental regulations. The Environmental Protection Agency delegates some of its responsibilities for water, air and solid waste pollution control to state agencies.

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

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

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

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

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

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

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

GREEN STRIPS:
See buffer strip.

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

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

HEAVY METALS:

Metals present in municipal and industrial wastes that pose long-tern environmental hazards if not properly disposed. Heavy metals can contaminate ground and surface waters, fish and other food stuffs. The metals of most concern are: Arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium and zinc (see also separate listings of these metals for their health effects).

HERBICIDE:

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

INFLUENT:

Influent for an industry would be the river water that the plant intakes for use in its processing. Influent to a municipal treatment plant is untreated wastewater.

INTERNATIONAL JOINT COMMISSION (IJC):

An agency formed by the United States and Canada to guide management of the Great Lakes and resolve border issues.

LANDFILL:

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

LEACHATE:

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

LOAD:

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

MACROPHYTE:

A rooted aquatic plant.

MASS:

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

MASS BALANCE:

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

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

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

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

NPS:
See nonpoint source pollution.

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

OUTFALL:
The mouth of a sewer, drain, or pipe where effluent from a wastewater treatment plant is discharged.

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

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

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

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

PLANKTON:
Tiny plants and animals that live in water.

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

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

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

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

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

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

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

RAP:
See Remedial Action Plan.

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

REMEDIAL ACTION PLAN:
A plan designed to restore beneficial uses to a Great Lakes Area of Concern.

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA):
This federal law amends the Solid Waste Disposal Act of 1965 and expands on the Resource Recovery Act of 1970 to provide a program which regulates hazardous wastes, to eliminate open dumping and to promote solid waste management programs.

RETRO-FIT:
The placement of an urban structural practice in an existing urban area, which may involve rerouting existing storm sewers and/or relocating existing buildings or other structures.

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

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

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

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

SECONDARY IMPACTS:
The indirect effects that an action can have on the health of the ecosystem or the economy.

SECONDARY TREATMENT:
Two-stage wastewater treatment that allows the coarse particles to settle out, as in primary treatment, followed by biological breakdowns of the remaining impurities. Secondary treatment commonly removes 90 percent of the impurities. Sometimes "secondary treatment" refers simply to the biological part of the treatment process.

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

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

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

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

STANDARDS:
See water quality standards.

STORM SEWERS:
A system of sewers that collect and transport rain and snow runoff. In areas that have separated sewers, such stormwater is not mixed with sanitary sewage.

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

TACs:
Technical advisory committees that assisted in the development of the Remedial Action Plan.

TOXIC:
An adjective that describes a substance which is poisonous, or can kill or injure a person or plants and animals upon direct contact or long-term exposure. (Also, see toxic substance.)

TOXIC SUBSTANCE:
A chemical or mixture of chemicals which through sufficient exposure, or ingestion, inhalation of assimilation by an organism, either directly from the environment or indirectly by ingestion through the food chain, will, on the basis of available information cause death, disease, behavioral or immunologic abnormalities, cancer, genetic mutations, or development of physiological malfunctions, including malfunctions in reproduction or physical deformations, in organisms or their offspring.

TOXICANT:
See toxic substance.

TREATMENT PLANT:
See wastewater treatment plant.

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

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

UNIVERSITY OF WISCONSIN-EXTENSION (UWEX):
A special outreach, education branch of the state university system.

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

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

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

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

WATER QUALITY AGREEMENT:
The Great Lakes Water Quality agreement was initially signed by Canada and the United States in 1972 and was subsequently revised in 1978 and 1987. It proves guidance for the management of water quality, specifically phosphorus and toxics, in the Great Lakes.

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

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

WATER QUALITY STANDARD VARIANCE:
When natural conditions of a water body preclude meeting all conditions necessary to maintain full fish and aquatic life and swimming a variance may be granted.

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

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

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

WISCONSIN NONPOINT SOURCE WATER POLLUTION ABATEMENT GRANT PROGRAM:

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

WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES):

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

PRIORITY WATERSHED PROJECTS IN WISCONSIN
1992

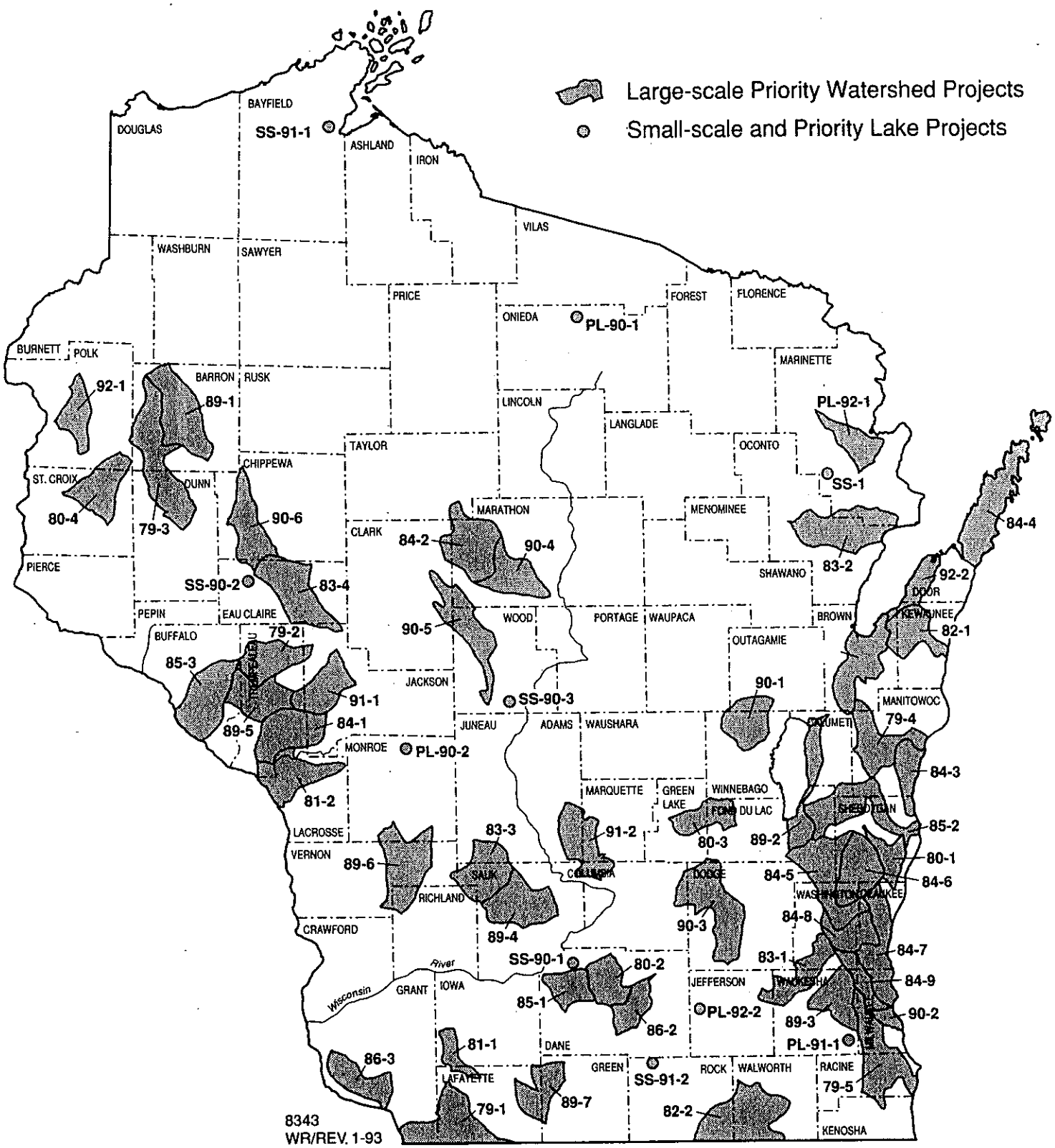
Map Number	Large-scale Priority Watershed Project	County(ies)	Year Project Selected
79-1	Galena River*	Grant, Lafayette	1979
79-2	Elk Creek*	Trempealeau	1979
79-3	Hay River*	Barron, Dunn	1979
79-4	Lower Manitowoc River*	Manitowoc, Brown	1979
79-5	Root River*	Racine, Milwaukee, Waukesha	1979
80-1	Onion River*	Sheboygan, Ozaukee	1980
80-2	Sixmile-Pheasant Branch Creek*	Dane	1980
80-3	Big Green Lake*	Green Lake, Fond du Lac	1980
80-4	Upper Willow River*	Polk, St. Crox	1980
81-1	Upper West Branch Pecatonica River*	Iowa, Lafayette	1981
81-2	Lower Black River	La Crosse, Trempealeau	1981
82-1	Kewaunee River*	Kewaunee, Brown	1982
82-2	Turtle Creek	Walworth, Rock	1982
83-1	Oconomowoc River	Waukesha, Washington, Jefferson	1983
83-2	Little River	Oconto, Marinette	1983
83-3	Crossman Creek/Little Baraboo River	Sauk, Juneau, Richland	1983
83-4	Lower Eau Claire River	Eau Claire	1983
84-1	Beaver Creek	Trempealeau, Jackson	1984
84-2	Upper Big Eau Pleine River	Marathon, Taylor, Clark	1984
84-3	Sevenmile-Silver Creeks	Manitowoc, Sheboygan	1984
84-4	Upper Door Peninsula	Door	1984
84-5	East & West Branch Milwaukee River	Fond du Lac, Washington, Sheboygan, Dodge, Ozaukee	1984
84-6	North Branch Milwaukee River	Sheboygan, Washington, Ozaukee, Fond du Lac	1984
84-7	Milwaukee River South	Ozaukee, Milwaukee	1984
84-8	Cedar Creek	Washington, Ozaukee	1984
84-9	Menomonee River	Milwaukee, Waukesha, Ozaukee, Washington	1984
85-1	Black Earth Creek	Dane	1985
85-2	Sheboygan River	Sheboygan, Fond du Lac, Manitowoc, Calumet	1985
85-3	Waumandee Creek	Buffalo	1985
86-1	East River	Brown, Calumet	1986
86-2	Yahara River - Lake Monona	Dane	1986
86-3	Lower Grant River	Grant	1986
89-1	Yellow River	Barron	1989
89-2	Lake Winnebago East	Calumet, Fond du Lac	1989
89-3	Upper Fox River (Ill.)	Waukesha	1989
89-4	Narrows Creek - Baraboo River	Sauk	1989
89-5	Middle Trempealeau River	Trempealeau, Buffalo	1989
89-6	Middle Kickapoo River	Vernon, Monroe, Richland	1989
89-7	Lower East Branch Pecatonica River	Green, Lafayette	1989
90-1	Arrowhead River & Daggets Creek	Winnebago, Outagamie, Waupaca	1990
90-2	Kinnickinnic River	Milwaukee	1990
90-3	Beaverdam River	Dodge, Columbia, Green Lake	1990
90-4	Lower Big Eau Pleine River	Marathon	1990
90-5	Upper Yellow River	Wood, Marathon, Clark	1990
90-6	Duncan Creek	Chippewa, Eau Claire	1990
91-1	Upper Trempealeau River	Jackson, Trempealeau	1991
91-2	Neenah Creek	Adams, Marquette, Columbia	1991
92-1	Balsam Branch	Polk	1992
92-2	Red River - Little Sturgeon Bay	Door, Brown, Kewaunee	1992

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

Map Number	Priority Lake Project	County(ies)	Year Project Selected
PL-90-1	Minocqua Lake	Oneida	1990
PL-90-2	Lake Tomah	Monroe	1990
PL-91-1	Little Muskego, Big Muskego and Wind Lakes	Waukesha, Racine, Milwaukee	1991
PL-92-1	Lake Noquebay	Marinette	1992
PL-92-2	Lake Ripley	Jefferson	1992

** Project completed*

Priority Watershed Projects in Wisconsin
1992



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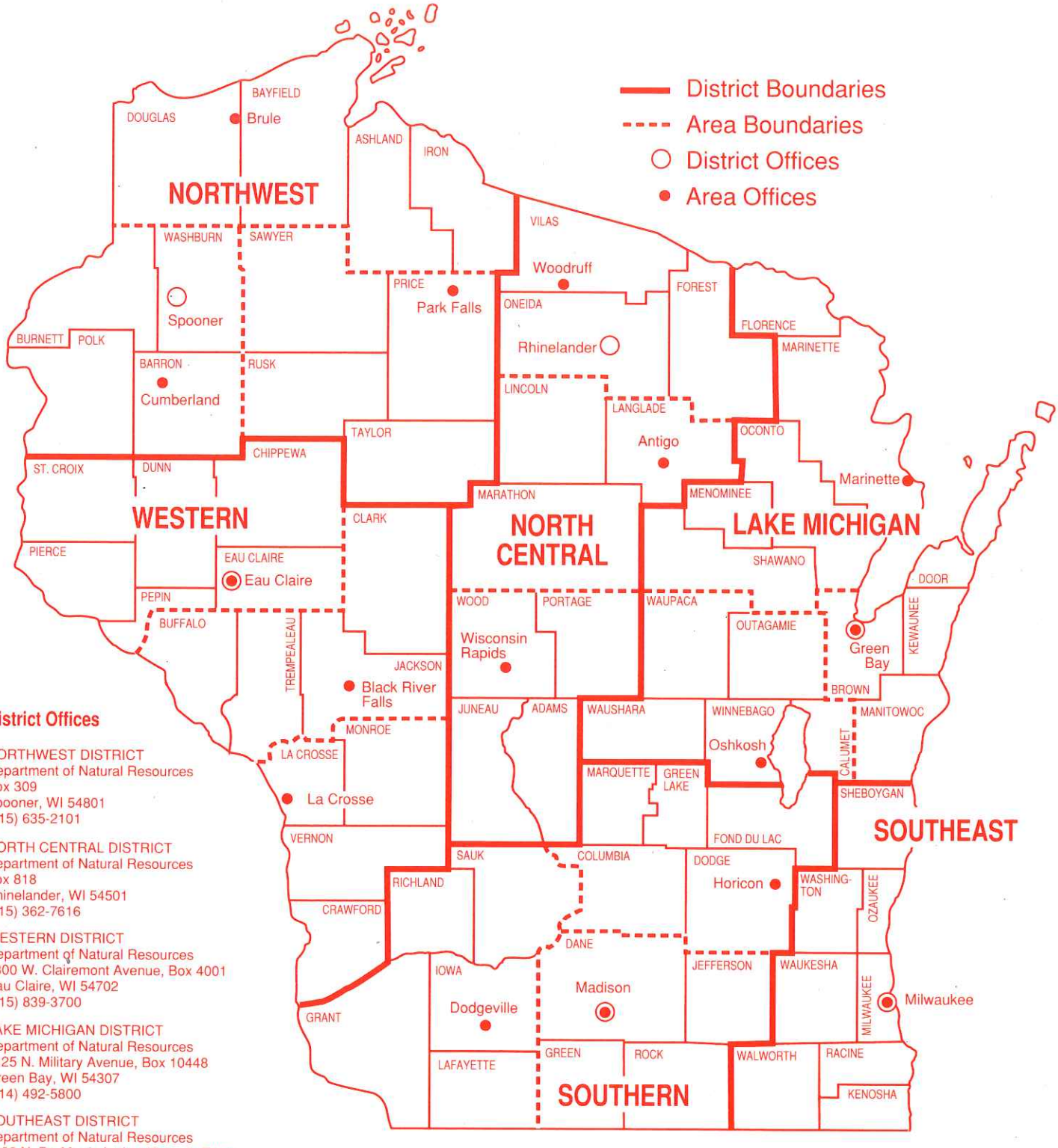
DNR Field Districts and Areas



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REV 8/91

Our Mission:

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

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

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

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

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